

# **The Northern Subject Rule: Constraints Without Input?**

## **Studying native speakers of Standard English**

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English Language & Culture

Semester 6

BA werkstuk Engelse taalkunde

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## **Abstract**

The current study was designed to see whether or not native speakers of Standard English show sensitivities towards the Type of Subject-constraint and the Subject Adjacency-constraint of the Northern Subject Rule (NSR). The NSR is a grammatical feature which allows for an -s on the verb in a plural context. If speakers of Standard English show such sensitivities, this cannot be due to the input that they received, but are rather caused by underlying innate principles which go beyond the input. A pre-test was needed to make sure that the experimental tests only tested the Northern Subject Rule, and that the results could not be due to anything else. The unbiased pre-test was used for the real tests. Two experimental tests consisted of test items which all had two possible answers for the participants to choose from: one sentence which shows either the Type of Subject or the Subject Adjacency-effect, and one sentence which does not. Results suggest that native speakers of Standard English are sensitive towards the Type of Subject-constraint, but not towards the Subject Adjacency-constraint.

*Keywords:* Northern Subject Rule, Type of Subject constraint, Subject Adjacency constraint, constraints without input, Standard English



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## 1. Introduction

Whether or not people are born with innate knowledge about language (nativist approach) is a heated ongoing debate. It could be the case that people learn language through the input they receive only (constructivist approach), but some phenomena suggest that people know things about language without ever having learned them. There are studies which have tried to show that people have grammatical knowledge about language which were not learned through the input they received, but are rather subject to general underlying principles (e.g., Hoendervangers, 2016, Slegers, 2017; Barbiers et al, 2018). It is difficult to prove that these ‘constraints without input’ exist, but it is plausible that language acquisition is governed by underlying principles and constraints, which could possibly be a part of something like a universal grammar (UG). This UG could be the innate knowledge that helps people to acquire a language. Studies like Barbiers et al. (2018) have tried to show that input sometimes is not rich enough and that a UG is necessary to account for linguistic knowledge which people have. Barbiers et al. (2018) studied grammaticality judgements of Dutch verb clusters by native speakers of Dutch. Their results suggest that native speakers of Dutch have intuitions about verb clusters which are not part of their own dialect (and are thus not part of their input). Barbiers et al. (2018) suggest that the underlying principle ‘binary merge’ causes these intuitions. The current study uses Barbiers et al. (2018) as an inspiration and examines whether or not native speakers of Standard English show sensitivities towards the Northern Subject Rule (NSR). If they do, this sensitivity cannot be due to the input because Standard English is a non-NSR variety of English, and underlying constraints might be at work. By examining sensitivities towards the NSR, this research could possibly contribute to the poverty of the stimulus argument and the universal grammar debate, because the NSR and its constraints may rise above knowledge obtained through input, or may even be related to universal linguistic knowledge.

The NSR is a grammatical feature present in Northern English dialects and related dialects such as Belfast English (Henry, 1995) and Appalachian English (Tortora & Den Dikken, 2010) which allows for an -s ending in a third person plural setting. Standard English, however, only allows for a zero ending when the subject is a lexical plural (see example (1) below). The NSR is governed by two constraints: the Type of Subject effect (TS) and the Subject Adjacency effect (SA).<sup>1</sup>

The TS-constraint states that a verb cannot be marked with an -s when the subject is pronominal, but when the subject is a lexical plural, an -s on the verb makes the sentence grammatical. The SA-constraint makes it possible to have an -s on the verb when the subject is pronominal, but only when there is an adverb between the subject and the verb. So, the verb does not get an -s when the subject and the verb are adjacent. Examples of the TS and the SA-constraint can be found in (1).

- (1) a. \*They sings<sup>2</sup>.  
       b. The girls sings.       (TS)  
       c. They often sings.     (SA)

This study aims to examine whether or not native speakers of Standard English, who do not have the NSR in the grammar of their first language (L1), are sensitive to the NSR-related TS and SA-effect. That is, to see if non-NSR speakers of English prefer sentences which conform to the TS and the SA-constraint over sentences which violate the two constraints. If non-NSR speakers are sensitive to constraints which are not present in their input, the NSR-constraints are possibly subject to underlying innate principles which go beyond the input.

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<sup>1</sup> TS and SA “-effect”, “-constraint”, and “-condition” are used interchangeably.

<sup>2</sup> An asterisk indicates ungrammaticality.

Hoendervangers (2016) carried out a similar research on sensitivity towards the NSR where she followed the methodology of Barbiers et al. (2015), and studied native speakers of Standard English by means of a ranking task. Participants were asked to rank four sentences per trial on grammatical acceptability. She found that non-NSR speakers were indeed sensitive to the TS and the SA-constraint, just like Barbiers et al. (2015) found that native speakers of Dutch had intuitions about verb clusters which did not exist in their dialects. Hoendervangers' (2016) methodology, however, cannot be judged as very reliable because of the test items: she designed test sentences which show both the TS and the SA-effect, so it is difficult to conclude which constraint made for the participants' decisions. Slegers (2017) and K. Derksen and S. Nederveen (2018)<sup>3</sup>, therefore, started to design new test materials in 2017 and 2018 to see if Hoendervangers' (2016) results could be replicated with a different methodology. Derksen and Nederveen (2018), however, did not manage to complete all of their testing because of time limits. This study, therefore, builds upon Hoendervangers (2016), Slegers (2017), and Derksen and Nederveen (2018) and uses a questionnaire in which participants are not asked to rank sentences but are forced to intuitively choose (and thus prefer) one sentence over another.

If it is indeed the case that native speakers of Standard English have intuitions about the NSR-related TS and SA-effect without having had any input of this kind, this study will support the idea that the NSR and its constraints are not learned, but are part of innate grammatical knowledge.

The remainder of this thesis is structured in the following way: Section 2 will elaborate on past research, and on how this study tries to improve the research that has been done on sensitivities towards the NSR. Sections 3 and 4 explain how this study and its methodology

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<sup>3</sup> Two university students at Radboud University in Nijmegen, K. Derksen and S. Nederveen, designed pre-tests to improve the research done by Hoendervangers (2016). Although their work was not published, I will refer to them as Derksen and Nederveen (2018) for the remainder of this thesis.

were designed, and Section 5 discusses the results and their implications. Section six concludes this thesis.

## 2. Past research

### 2.1 The Northern Subject Rule and its origin

As already mentioned in the introduction the Northern Subject Rule (NSR) is a grammatical feature in NSR-dialects which allows for an -s on the verb in a third person plural context. Both the Type of Subject constraint (TS) and the Subject Adjacency (SA) constraint determine when the verb is marked with the -s or  $\emptyset$ .

The TS-constraint states that the verb receives an -s when the subject is a lexical plural. Example sentences can be found in (2) below. Sentence (2a) is ungrammatical because the subject is pronominal instead of nominal; when the subject is lexical, as in (2c), the -s on the verb makes the sentence grammatical. Speakers of Standard English consider only (2b) to be grammatical, because Standard English only allows for a zero ending when the subject is a plural.

- (2) a. \*They sings.  
 b. They sing.  
 c. The girls sings.

The SA-constraint determines that the verb receives an -s when the pronominal subject and the verb are not adjacent to each other (separated). If an adverbial sits between the pronominal subject and the verb, the subject and the verb are no longer adjacent and the -s on the verb makes the sentence grammatical. Consider (3) below. Sentence (3a) is ungrammatical because the verb does not receive an -s when the subject is pronominal. Sentence (3b) is grammatical, however, because the (pronominal) subject and the verb are not adjacent to each other and then an -s on the verb is needed.

- (3) a. \*They sings.

- b. They often sings.
- c. The girls often sings.

The TS-constraint and the SA-constraint together make for the following grammatical and ungrammatical sentences:

- (4) a. [Pronominal – V-Ø]
- b. \*[Pronominal – V-s]
- c. [Pronominal – X – V-s]
- e. [Lexical – V-s]
- f. [Lexical – X – V-s]

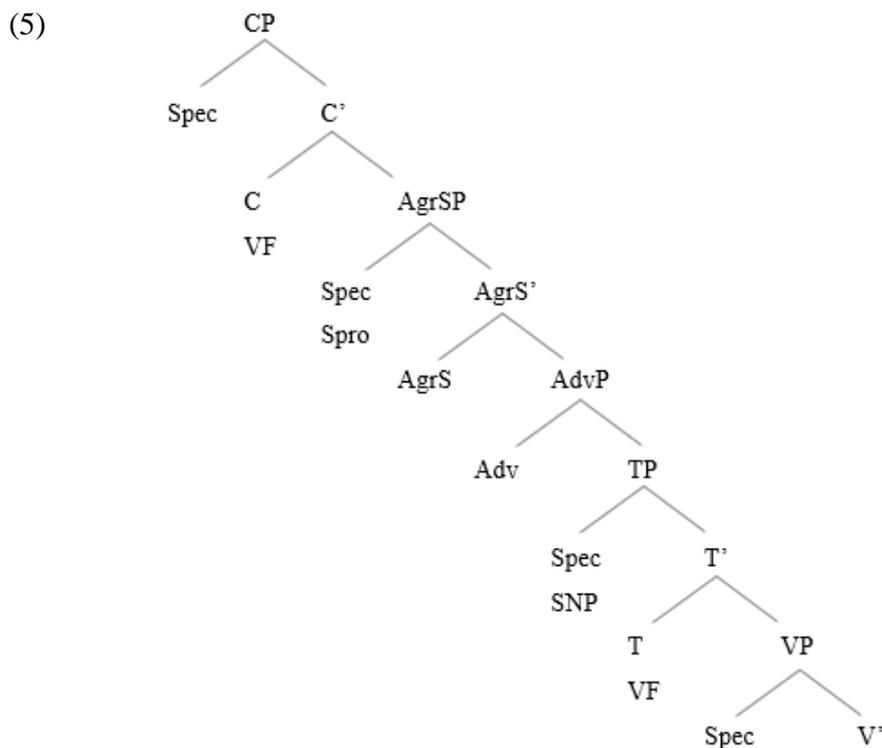
De Haas and Van Kemenade (2015) carried out a corpus study on Middle English and showed that the zero/e/n/-s endings in NSR-dialects were conditioned by the TS and SA-effect, and were present in Middle English. They found that the “NSR pattern is stronger in the Northern dialect texts than in the Midlands” (p. 55) and that the NSR originated around Yorkshire (which is why it is called the *Northern* Subject Rule). The TS-constraint is more likely to be at the core of the NSR than the SA-constraint, because the SA-constraint was weaker and often absent.<sup>4</sup> This suggests that the difference between subject types is more crucial than the difference between adjacency and non-adjacency for the NSR. Modern dialects which show patterns like these are Belfast English (Henry, 1995) and Appalachian English (Tortora & Den Dikken, 2010), where a plural subject co-occurs with a verb carrying an -s suffix. Henry (1995) and Tortora and Den Dikken (2010) refer to this NSR-like phenomenon as ‘singular concord’ rather than the Type of Subject constraint. As mentioned above, the TS-constraint is at the core

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<sup>4</sup> To be found in for example East Midland texts such as Oxford, Merton College MS 248 (Merton248), London, Dulwich College MS XXII (Dulwich) and Havelok (De Haas & Van Kemenade, 2015).

of the NSR, and this singular concord exists in the two dialects of English, but the Subject Adjacency constraint (or a SA-like effect) is absent. There are no dialects of English which show an SA-like effect, but lack a TS-like effect. NSR-dialects showed this ‘pattern’, because the SA-effect was sometimes absent, and the SA-effect was only present when the TS-effect was.

De Haas and Van Kemenade (2015) provide an analysis of the NSR in terms of differentiated subject positions in Middle English NSR dialects. Their corpus study showed that Middle English NSR dialects “have the same basic syntax as other varieties of older English, including differentiated subject positions” (p. 71). De Haas and Van Kemenade (2015) propose the following sentence structure, where the ‘Spro’ and the ‘SNP’ positions are the two subject positions outside the verb phrase (VP):



Middle English had differentiated subject positions and had the NSR in its grammar. If it is indeed the case that speakers of Standard English are sensitive towards the NSR and its constraints, and the NSR (in Middle English) goes hand in hand with the existence of several

VP-external subject positions, we might hypothesise that Standard English has several VP external subject positions as well. Kiss (1996) argued for this in her article. She argued that Modern English has two subject positions outside the VP, because of the existence of RefP (a subject can sit in SpecRefP). The existence of RefP is currently being researched by means of a corpus study (L. Hendriks, personal communication, 2019). Tortora and Den Dikken (2010) argued that both Belfast English and Appalachian English also make use of two subject positions.<sup>5</sup> As mentioned before, these two varieties of English show singular concord, which is an NSR-like phenomenon. If the results of this thesis indicate that speakers of Standard English are sensitive towards the TS and SA-constraint, it might be the case that several VP external subject positions also exist in Modern English (based on the analyses of Kiss, 1996; Tortora & Den Dikken, 2010; De Haas & Van Kemenade, 2015). If native speakers of Standard English show intuitions towards the NSR, it could be the case that the existence of these VP-external subject positions form the constraint which triggers intuitions towards the NSR.

## **2.2 Barbiers, Bennis and Dros-Hendriks, 2018.**

Barbiers et al. (2018) provided support for a Nativist-approach to language acquisition by showing that native speakers of Dutch have intuitions about Dutch verb clusters without having learned these verb clusters through their input. They studied verb clusters in Dutch, because word order variation is common in Dutch in embedded clauses when the verb cluster is positioned finally and the main verb is accompanied by two more verbs, like modals or auxiliaries. Logically, six different verb orders can be formed in Dutch, and examples of these can be found in (6). The verb “zwemmen” (V3) is the main verb.

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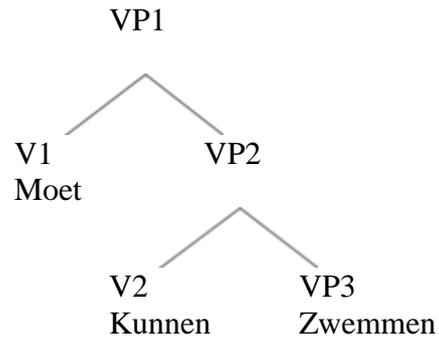
<sup>5</sup> Tortora and Den Dikken (2010) provide evidence for the existence of three possible VP external subject positions in total. Both Belfast English and Appalachian English make use of only two positions, but not the same two positions. That is why they argue that there are three possible subject positions.

- (6) a. Ik vind dat iedereen moet kunnen zwemmen. V1-V2-V3  
 I find that everyone must can swim.  
 “In my opinion, everyone should be able to swim.”
- b. moet zwemmen kunnen V1-V3-V2  
 must swim can
- c. kunnen moet zwemmen V2-V1-V3  
 can must swim
- d. kunnen zwemmen moet V2-V3-V1  
 can swim must
- e. zwemmen moet kunnen V3-V1-V2  
 swim must can
- f. zwemmen kunnen moet V3-V2-V1  
 swim can must

Barbiers et al. (2018) assume that these verb clusters are built by means of the operation of binary merge. If that is indeed the case, then sentences (6a), (6b), (6e), and (6f) are possible verb clusters in Dutch and sentence (6c) and (6d) are not. Binary merge allows for these four orders only:  $[VP_1 V_1 [VP_2 V_2 VP_3]]$ ,  $[VP_1 [VP_2 V_2 VP_3] V_1]$ ,  $[VP_1 V_1 [VP_2 VP_3 V_2]]$ ,  $[VP_1 [VP_2 VP_3 V_2] V_1]$ . In syntactic tree structure the four verb clusters look like this:

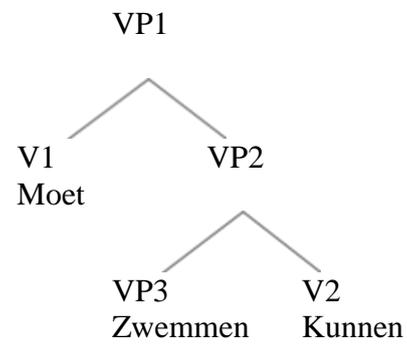
(7) a.

V1-V2-V3



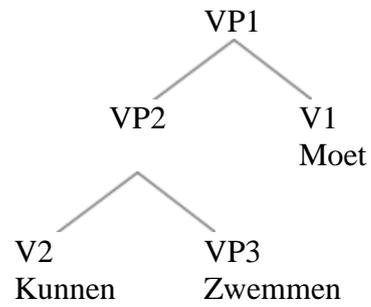
b.

V1-V3-V2



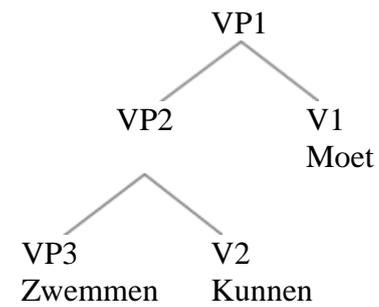
c.

V2-V3-V1



d.

V3-V2-V1



The frequency of these verb clusters varies across Dutch dialects. Both the V2-V1-V3 and the V2-V3-V1 order are absent in every dialect. V1-V2-V3 is present everywhere except for in the province Friesland. V3-V2-V1 occurs only in the north of the Netherlands. V3-V1-V2 is present throughout almost all provinces of the Netherlands, but it is never the only occurring order. If V3-V1-V2 is present, V1-V2-V3 also is. V1-V3-V2 is the least frequent order and mostly occurs in the east of the county, but is never the only occurring order. It always occurs together with the V1-V2-V3 or/and the V3-V1-V2 order. Barbiers et al. (2018) hypothesised that, if binary merge was the underlying builder of syntactic structures, Dutch natives from all parts of the Netherlands would always prefer sentence (6a), (6b), (6e), and (6f) over (6c) and (6d). They tested this by asking Dutch participants to rank the six verb clusters as in (6). All six test sentences started with “Ik vind dat iedereen” and was followed by one of the six logically possible verb orders. That way, only the verb clusters differed in the test sentences. Participants were asked to rank the sentences 1 (highest) to 6 (lowest) on grammatical acceptability, and it was not allowed to rank two or more sentences with the same score. The results of the experiment were as predicted: the (according to binary merge) non-occurring verb orders V2-V1-V3 and V2-V3-V1 were always judged to be the worst. The participants who participated in this study were from different parts of the Netherlands and their L1-dialects thus varied. Even though all participants had been exposed to different verb clusters because of their dialects, they judged V2-V1-V3 and V2-V3-V1 to be the worst. Barbiers et al. (2018) propose binary merge to be the explanation for this result, which is argued to be part of universal grammar by the Nativists. It thus seems to be the case that the intuitions native Dutch people have about verb clusters is underlyingly governed by the constraint binary merge. Dutch people seem to know more about verb clusters than they receive through their input, which contributes evidence to the idea of the poverty of the stimulus. The poverty of the stimulus argument states that the input which children receive to acquire every feature of their language is not rich enough.

People seem to have more grammatical knowledge of languages as would be expected from their input, as Barbiers et al. (2018) showed. The argument is considered evidence for underlying innate principles which are possibly present in universal grammar. These innate principles form the innate linguistic knowledge.

The current study builds on the idea that there are underlying principles to language for which there is no direct evidence in the input. The same can be the case for the NSR-related TS and SA-effect. Native speakers of Standard English might have innate knowledge about the NSR and judge the TS and SA-effect because of underlying constraints, which are not at all present in their input. The first step is to see if speakers of Standard English are sensitive to the NSR. If they are there must be an underlying principle at work, because information about the NSR from the input is non-existent. The idea of existing constraints which are not present in the input that children receive adds to the UG-debate, because this linguistic knowledge has to come from innate principles if it does not come from anything else (input). If native speakers of Standard English are sensitive towards the NSR, this study provides data which can contribute to this debate. This study is different from for example Barbiers et al. (2018), because participants will be tested on a grammatical feature which does not exist in their input at all. Barbiers et al. (2018) tested variations on a verb cluster that exists throughout the Netherlands.

### **2.3 Hoendervangers, 2016**

Hoendervangers (2016) studied whether non-NSR speakers (native speakers of Standard English and native speakers of Dutch) were sensitive to the NSR-related TS and SA-effect. She thus tested if speakers who do not have the NSR in their L1 would prefer sentences which show the TS or the SA-effect over sentences that do not. She based her methodology on Barbiers et al. (2015) and used a grammaticality ranking task to test if participants preferred NSR-sentences over non-NSR sentences. Participants were given four sentences and were asked to rank them

1 (most acceptable) to 4 (least acceptable). An example from Hoendervangers' test items can be found in (8):

- (8) a. My brothers usually goes to the market on Tuesday. (TS+/SA+)  
 b. Usually my brothers goes to the market on Tuesday. (TS+/SA-)  
 c. They usually goes to the market on Tuesday. (TS-/SA+)  
 d. Usually they goes to the market on Tuesday. (TS-/SA-)

(8a) does not violate either the TS or the SA-constraint; (8b) violates the SA-constraint, because the subject and the verb are adjacent; (8c) violates the TS-constraint, because the subject is pronominal; and (8d) violates both the TS and the SA-constraint.

Hoendervangers' (2016) results suggested that the participants showed sensitivities to both the TS and SA-constraint, because they preferred the sentences which show the NSR-related constraints. Hoendervangers (2016) then concluded that the NSR-constraints have to be governed by general underlying grammatical properties that go beyond the input, because speakers of non NSR-dialects are sensitive to the NSR without being exposed to the NSR in their input.

This study differs from Hoendervangers' (2016) because this study does not use a grammaticality ranking task with sentences which show both the TS and SA-effect, but it forces participants to choose between two sentences which only show one of the two constraints (either the TS or SA-constraint). This way, if there is a result, the reason for the result is more transparent. Only one of the NSR-constraints can be the cause for the decision which the participants make. Hoendervangers (2016) used sentences with the TS-effect and the SA-effect in the same sets of four test sentences, and even in the same test sentence (see example sentence (8a)). By doing this, it is hard to conclude which constraint made the participant prefer one

sentence over another. That is why this study does not test both the TS and SA-effect in one test sentence, but only shows one of the effects per test sentence. The TS and the SA-effect are tested with different test items, which creates clearer and more reliable results. Secondly, Hoendervangers (2016) did not use a pre-test, but this study does. She interpreted her results as if they show effects caused by the TS and SA-effect, but this need not be the case. A pre-test is needed to ensure that participants do not prefer the NSR-sentences for completely different reasons than for the TS or SA-effect. In other words, it is quite possible that participants preferred “The girls sings” over “They sings” not because of the NSR, but for example because “The girls” and “sings” both end in an -s and “They” does not. It could also be the case that participants preferred a lexical subject over a pronominal subject because a pronominal subject needs to refer back to a previously mentioned subject, and a lexical subject does not. This is because a lexical subject provides a reader or listener with a lot more information about the subject than a pronominal subject. Hoendervangers (2016) did not control for this. If processes like these are the cause for the decisions of the participants, then the results from Hoendervangers (2016) cannot be interpreted as if they say anything about the NSR. The same is true for the SA-effect, as adverbs have rather limited positions in English. Strong evaluatives (e.g. unfortunately, amazingly, sadly), for example, are always preferred in initial position (Ernst, 2009). So, native speakers of English might ignore the -s on the verb and follow their instincts on adverb placement instead, which makes for a test which tests adverb placement instead of the NSR. This would make for unreliable results and conclusions about sensitivities towards the NSR. A pre-test can rule out all other factors which can influence participants, and provide for an unbiased experimental test<sup>6</sup>; a test which tests preferences towards the NSR instead of other processes and/or intuitions.

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<sup>6</sup> The terms “experimental-”, “real-”, and “actual-” test are used interchangeably. The experimental tests are sometimes referred to as (just) test(s), when there is no need for further explanation.

## 2.4 Slegers, 2017

Slegers (2017) built on the research done by Hoendervangers (2016) and also investigated sensitivities towards the NSR. He found flaws in her methodology and conducted a more reliable research by changing a ranking task into a grammatical judgement test. He did not test native speakers of Standard English and Dutch, however, but he tested native speakers of Danish. He chose to examine Danish because, opposed to English and Dutch, this language lacks agreement. This means that “there is no subject-verb agreement variation if the subject changes position or nature, because there is no agreement to vary with” (Slegers, 2017, p. 24). It was hypothesised that if speakers of a language without agreement (such as Danish) show a sensitivity towards the NSR-related TS and SA-effect, the presence of agreement in the L1 cannot be the cause for that sensitivity. If agreement could be ruled out as the cause, the argument made by Hoendervangers (2016) that the NSR is governed by underlying principles would be made stronger. After testing native speakers of Danish, Slegers (2017) concluded that the participants showed sensitivities towards the TS and SA-effect. He then argued that agreement cannot be the cause of the sensitivity, but innate constraints are. Like this, he provided an argument in favour of constraints which exist without input.

It seems as if Slegers (2017) used a significant part of his thesis to explain why Hoendervangers' (2016) methodology was not reliable, but he did consider her results valid and based his research on her results and conclusions. He assumed that the native speakers of Dutch and English were indeed sensitive to the NSR-related TS and SA-effect, and used this result to conclude that sensitivity towards the NSR is not caused by the existence of agreement in a language. Slegers (2017) even speaks of successfully replicating Hoendervangers' (2016) results in his conclusion. He, however, missed a crucial step. After criticising and altering the methodology used by Hoendervangers (2016), native speakers of Dutch and English should be tested again with the new methodology before testing a different population. This is needed to

check whether or not Hoendervangers' (2016) results are reliable or not. If her results can be replicated using a different method, it is safer to assume that her results and conclusions are correct. Only then new research and conclusions can be based on her work. That is why this study tests native speakers of Standard English, using a methodology which is similar to Slegers' (2017).

### **3. Designing the current study**

As mentioned before, Hoendervangers (2016) did not design a pre-test, and this made her results rather unreliable. That is why this study uses a pre-test before testing participants on the NSR. Unlike the experimental test, the pre-test should not show any NSR-related effects. Where the NSR allows for an -s on the verb, there will not be an -s on the verbs of the test sentences in the pre-test. By testing the preferences for normal (grammatical) sentences, it is possible to create an experimental test which is not influenced by other potential processes, such as rhyme, alliterations, or preferences/constraints from the L1 (Standard English). An unbiased pre-test must be designed before a test can be made which has all verbs marked with an -s (and thus shows the TS and SA-constraint). ‘Unbiased’ here refers to a test which does not show a primary preference towards either of the test items. Apart from the -s on the verbs the pre-test is the same as the actual test, so only the NSR-constraints (either the TS or SA effect) are responsible for the outcome of the tests.

Three tests were designed for this study: a pre-test for the TS-condition, a test for the TS-condition, and a test for the SA-condition. The pre-test for the SA-condition was designed by Derksen and Nederveen (2018).

#### **3.1 Pre-test Type of Subject condition**

Preferences towards a nominal or a pronominal subject might primarily exist, even without the NSR-constraints. That is why the number of regular and irregular plurals should be controlled for. Almost all lexical plurals in English end in an -s and the verb does too. If there are only regular plurals in the test, there might be a bias towards lexical plurals simply because they end on an -s. Irregular plurals like “women”, “sheep”, and “children” have to counterbalance the regular plurals.

Participants might also prefer a lexical subject over a pronominal subject because a lexical subject provides a reader with more information. In order for the pronominal subject “they” to carry specific information about who “they” are, this subject needs to refer back to earlier mentioned people. To make sure that lexical subjects are not preferred over pronominal subjects just because pronominal subjects have to refer back to something, context sentences have to be added to the test items. These context items are then followed by two sentences for the participants to choose from, one of which has a lexical subject and the other the pronominal subject “they”. These one or two context sentences at the beginning of the test item introduce a lexical subject. This makes it clear to the reader who “they” are, and like this the lexical subject is not more informative than the pronominal subject. Consider (9), (10), and (11). Note that the examples do not have an -s on the verbs because this is the pre-test.

(9). <No context information>

- a. The men like to fight. (1)
- b. They like to fight. (0)

(10). These men are very strong.

- c. The men like to fight. (1)
- d. They like to fight. (0)

(11). These men are very strong. The wrestling competition is next week.

- e. The men like to fight. (1)
- f. They like to fight. (0)

If the test items are presented without context like in (9), it is hypothesised that participants prefer (9a) over (9b) simply because “The men” is more informative than “They”. A context sentence as in (10) introduces the lexical subject before the participants are forced to choose between “The men” or “They”. It is hypothesised, however, that participants prefer (10d) over (10c), because repetition of the subject is not necessary. To solve the problem of repetition a second context sentence has to be added, as in (11). The subject of the second context sentence serves as a slight distraction from the first lexical subject. This makes both (11e) and (11f) pragmatically correct and it is expected that participants will not strongly prefer one over the other. As can be seen in (9), (10), and (11) the items are valued either 1 or 0. To see if the pre-test is unbiased every item is valued either 1 or 0 and the mean score of the test has to be calculated. If the test does not show a bias the mean score should be around .5 and not significantly differ from .5 ( $p > .05$ ).

Derksen and Nederveen (2018) designed such a pre-test for both the TS and SA-condition. Their TS pre-test was not successful, however, because the 14 test items which they designed showed a strong bias towards pronominal subjects (bias towards 0) in initial position ( $M = .34$ ). It was not possible to alter the test and take items out to make the overall test unbiased, because the original pre-test consisted of only 14 items. Alterations would leave too few items in the real test. The bias towards pronominal subjects can be accounted for after analysis of the test items: very few of the test items’ distraction sentences (second context sentence) had an animate subject. Almost all distraction sentences had inanimate subjects, which makes it plausible that native English participants refer back to the first sentence with the pronominal subject “they” (examples of these sentences can be found below). If the second subject that readers encounter is not a person, there is no one between the first lexical subject (first context sentence) and the sentence of the participants’ choosing (third sentence) which could possibly be referred back to with “they”. This leaves only one logical answer for participants, which is

the pronominal subject. It is hypothesised that if the subject of the second sentence is inanimate, native speakers of Standard English will always prefer a pronominal subject after the context sentences. The opposite is also true: if the subject of the second sentence is animate, participants will prefer a lexical subject after the context sentences. This hypothesis is confirmed when looking at the test items used by Derksen and Nederveen (2018). Examples (12), (13), (14), and (15) are four of the 14 test items of the test, and these items demonstrate the expected effect ( $M_{(12)}=.31$ ;  $M_{(13)}=.19$ ;  $M_{(14)}=.67$ ;  $M_{(15)}=.53$ ). The test items in examples (14) and (15) were the only test items in the test with an animate subject in the second context sentence, and these were the only test items for which participants preferred a lexical subject in first position. The test items in (12) and (13) did not have an interfering animate subject, and participants preferred a lexical subject over a pronominal subject. All 14 test items and results of this pre-test can be found in Appendix E.

- (12) My feet are always cold. Weirdly enough even during the summer.
- A. My feet need at least three layers of socks to be warm. (1)
  - B. They need at least three layers of socks to be warm. (0)
- (13) The dogs seem to be having a great time. It is raining terribly, but...
- A. The dogs love running around. (1)
  - B. They love running around. (0)
- (14) These bacteria easily cause an epidemic. Many people are already struck.
- A. The bacteria spread rapidly. (1)
  - B. They spread rapidly. (0)
- (15) My teeth need a lot of care. Going to the dentist is expensive, but ...
- A. My teeth look good now. (1)
  - B. They look good now. (0)

It is predicted that counterbalancing the number of animate and inanimate subjects in the second context sentences makes for an unbiased test. That is why a new pre-test has to be designed, which has more than 14 items and has both animate and inanimate subjects in the second context sentences.

### **3.2 Pre-test Subject Adjacency condition**

All adverbs used in the SA-test are clause-oriented adverbs (e.g. politically, moreover, luckily), because these adverbs modify a clause instead of a VP. Clause-oriented adverbs are less closely associated with the VP, and thus less likely to be positioned in or adjacent to the VP. They are positioned rather high in the sentence structure and are thus preferred in initial or central position. Consider (16).

- (16) a. Politically, the country is unstable.  
b. Luckily, they watched TV until dinnertime.

These are thus suitable for a test in which the adverbs sit in first or second position. This is, however, rather challenging for the current study because the adverbs in the SA-constraint do not appear in first but in second position, and most clause-oriented adverbs are strong evaluatives which are preferred strongly in first position (Ernst, 2009). The adverbs used in the pre-test, therefore, have to be chosen carefully. If the adverbs in the test are too strongly preferred initially, participants might prefer adverbs in first position because of their intuitions on adverb placement instead of their intuitions towards the NSR. That is why the adverbs used in the test cannot be strong evaluatives because these are automatically preferred in first position. The preference for strong evaluatives which natives have might be too strong to

'compete' with the SA-constraint, and then the test would only show adverb preferences, instead of preferences towards the NSR. A pre-test is necessary to see which adverbs can be used for the test. As in the TS pre-test, this test needs test items valued at 1 or 0 to see whether or not there is a bias towards either adverbs in first or in second position. Again, a context item will be given first so that the pronominal subject refers back to an earlier mentioned subject. Participants are forced to choose between a sentence with an adverb between the pronominal subject and the verb (valued 1) and a sentence with an adverb initially, followed by the pronominal subject and the verb. An unbiased test would have a mean of around .5, which does not significantly differ from .5 ( $p > .05$ ).

The pre-test which Derksen and Nederveen (2018) designed had 36 items ( $M = .43$ ,  $p = .006$ ). All items and results of this pre-test can be found in Appendix F. This test showed a slight bias toward adverbs in first position, but as there were 36 items, it was possible to slightly alter the test. All items with a mean score below .15 or above .85 were deleted to create a set of items with more similar scores. After the deletion of test item 4 ( $M = .94$ ), 8 ( $M = .08$ ), 10 ( $M = .89$ ), 14 ( $M = .14$ ), 24 ( $M = .11$ ), 26 ( $M = .11$ ), 28 ( $M = .14$ ), and 40 ( $M = .08$ ), the mean score of the test was close to .5 and did not significantly differ from .5 ( $M = .47$ ,  $p = .22$ ,  $SD = .16$ ). The remaining 28 items were checked by L. Hendriks (personal communication, 2019) to make sure that the final version of the test did not contain any strong evaluatives. She concluded that no further items had to be removed, so these 28 items made an unbiased set to use for the test in the current study.

## 4. Method

### 4.1 Participants

Three different groups of 30 participants each took the tests. Gender and age in years of the participants per test can be found in Table 1:

Table 1: *Gender and average age of the participants*

	N	Male	Female	Gender unspecified	M <sub>age</sub>
Pre-TS	30	12	18	-	22.5
SA	30	5	24	1	23.3
TS	30	12	18	-	24.4

All participants were between the ages of 18 and 40, from the UK, and their L1 was English. All participants reported not to have any literacy difficulties, and their level of education had to be College A-level, Graduate, Undergraduate, or Doctorate to participate. To make sure that none of the participants were familiar with the NSR or had any advanced knowledge of linguistics, participants who studied English Language, or Languages could not take part in the experiment. To make sure that none of the participants had the NSR as part of their L1, participants could only participate if their UK area of birth and current UK area of residence was one of the following: East Midlands (England), West Midlands (England), East of England, South East England, or South West England.<sup>7</sup> All participants were recruited through Prolific ([www.prolific.ac](http://www.prolific.ac)).

### 4.2 Materials

All of the test items are referred to as either option A or B in this thesis, because this is the way in which the items were created in Qualtrics (Qualtrics, Provo, UT, 2005). The TS pre-test

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<sup>7</sup> East Midlands, England: Derbyshire and Nottinghamshire, Leicestershire, Rutland and Northamptonshire, Lincolnshire; West Midlands, England: Herefordshire, Worcestershire and Warwickshire, Shropshire and Staffordshire, West Midlands; East of England: East Anglia, Bedfordshire and Hertfordshire, Essex; South East, England: Berkshire, Buckinghamshire, and Oxfordshire, Surrey, Sussex, Kent, Hampshire and Isle of Wight; South West, England: Gloucestershire, Wiltshire and Bristol/Bath area, Dorset and Somerset, Cornwall and Isles of Scilly, Devon.

options A always started with a lexical subject, and the options B started with a pronominal subject.<sup>8</sup> Option A in the experimental tests always conformed to the NSR-constraints, unlike option B which did not. Every example test item in this thesis thus shows this pattern. This consistency in order for option A and B is not something that the participants could experience during the test, because the answers to the test items were randomised.

*Test 1: Pre-test Type of Subject condition.* The pre-test for the Type of Subject condition consisted of 32 test items and 26 filler items. All 32 test items were designed specifically for this study and most of the fillers were taken from Slegers (2017). All test items consisted of four parts. The first sentence introduced the lexical plural subject, and the second sentence served as a delicate distraction from the lexical subject in the first sentence. These two sentences together created the context information. Two different sentences to choose between (A or B) were given after the two context sentences. One of the options (A) always had the same lexical plural as the first context sentence for a subject, and the other option (B) always started with the pronominal subject “They”. The pre-test was not designed to test the NSR-constraints, but to create an unbiased test on which the experimental test could be based. The context sentences’ answers of the pre-test thus did not include the -s on the verb. Each option A (lexical subject) was valued 1 and each option B (pronominal subject) was valued 0. The subjects of the distraction sentences were half animate subjects and half inanimate subjects. The distraction sentences never repeated the lexical subject from the first sentence, and never referred to the lexical subject from the first sentence in any way. Two examples of test items (from the actual test) can be found below:

(17) PL-T-01 These men are very strong. The wrestling competition is next week.

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<sup>8</sup> The SA pre-test was designed by Derksen and Nederveen in 2018, but the test was designed in the same way as the three tests for the current study. The test was designed in Qualtrics (Qualtrics, Provo, UT, 2005) and the options A always started with a pronominal subject and options B started with an adverb.

- A. The men like to fight. (1)
- B. They like to fight. (0)
- (18) PL-T-02 The women often go to the restaurant. The waiter who works there is very good looking.
- A. The women like to look at good looking men. (1)
- B. They like to look at good looking men. (0)

All items except for the ‘half-way-mark’ were randomised, and all of the items were given validation, randomisation of answers, and recoded values. A half-way-mark was added to the test(s) to let participants know when they had finished half of the test. This minimises the number of participants who do not finish the test. All test items were coded PL-T(...), and all the filler items were coded PA-C1(...), PA-C2(...), or PL-C1(...). This way, the test items were easy to distinguish from the fillers. The entire TS pre-test can be found in Appendix A. An example of a filler item (from the actual test) can be found below:

- (19) PA-C1-1 John and his friends are going to a concert. U2 is their favourite band.
- A. They love their latest record. (1)
- B. They loved their latest record. (0)

*Test 2: Test Subject Adjacency condition.* The pre-test for the Subject Adjacency condition was designed by Derksen and Nederveen in 2018. This test consisted of 36 test items and 50 filler items. This pre-test was successful and could thus be changed from pre-test to real test and be used for this study. The structure of the items was similar to the items for the TS pre-test: a context sentence followed by the options A and B. Option A always started with the pronominal subject “They” followed by an adverbial (SA-effect), and option B always started

with an adverbial followed by the pronominal subject “They”. All the possible answers to the test items’ context sentence (from the pre-test) were provided with an -s attached to the verb, which made for sentences which showed the NSR related SA-effect. All the adverbials in the test items were checked to make sure that there were not any strong evaluatives that could manipulate the results. Each option A (pronominal subject followed by adverbial) was valued 1 and each option B (adverbial followed by pronominal subject) was valued 0. An example of a test item (from the actual test) can be found below:

- (20) PA-T-1 My twin sisters like the same things.
- A. They apparently loves mustard a lot. (1)
- B. Apparently they loves mustard a lot. (0)

All items except for the half-way-mark were randomised, and all of the items were given validation, randomisation of answers, and recoded values. All test items were coded PA-T-(...) and the fillers were coded PA-C1-(...), PA-C2\_(...), PL-C1-(...), PL-C2-(...), or PL-T-(...). The entire SA test can be found in Appendix B. An example of a filler item (from the actual test) can be found below:

- (21) PA-C1-1 Most university staff doesn't bring lunch to work.
- A. The professors eat in the cafeteria every day. (1)
- B. The professors eat every day in the cafeteria. (0)

*Test 3: Test Type of Subject condition.* The pre-test was used as the base for this test. An -s was added to the verbs of the 32 test items (see Appendix C). Apart from the -s on the verbs,

this test was identical to the TS pre-test (for the filler items and the other questions, see Appendix A). An example from the test can be found in (21):

(22) The firefighters have to act quickly. The shopping centre is on fire, but luckily...

A. The firefighters knows what to do. (1)

B. They knows what to do. (0)

All three tests included the same general questions at the end. Participants were asked their first language, gender, age in years, current education, and if they had ever lived in a different area than East, West, or South England<sup>9</sup> for over one month. These general questions can also be found at the end of Appendix A and B.

### 4.3 Procedure

All of the participants received the test through Prolific ([www.prolific.ac](http://www.prolific.ac)) and took the test on their computer, tablet, or mobile phone. They were asked to complete the test in a quiet environment in order to be able to concentrate as well as possible. The tests took roughly 15 minutes, but participants were given a maximum of 30 minutes to complete the tests. It was not possible for participants to return to previous questions, because they had to answer intuitively instead of being able to reconsider their answers. All participants were paid a reward afterwards for participating in the experiment. Pre-screening the participants happened by using the pre-screening functions in Prolific ([www.prolific.ac](http://www.prolific.ac)). The participants did not have to fill out a questionnaire beforehand, but Prolific ([www.prolific.ac](http://www.prolific.ac)) made an automatic pre-selection of participants who met the requirements for these tests. All the pre-screening requirements can be found in Appendix D.

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<sup>9</sup> (1) Northern England (Cheshire, Cumbria, County Durham, Yorkshire, Manchester, Lancashire, Merseyside, Northumberland, Tyne and Wear, or Lincolnshire); (2) Scotland; (3) Belfast; (4) Appalachian mountain region, USA (western Pennsylvania, West Virginia, eastern Kentucky, eastern Tennessee, northern Alabama, or northern Georgia).

#### **4.4 Design & Analysis**

All of the tests were designed in Qualtrics (Qualtrics, Provo, UT, 2005). The tests were published on the internet using Prolific ([www.prolific.ac](http://www.prolific.ac)). Halfway during the tests, the participants received a notification that they had completed the first half of the test. After completing the test, participants were automatically sent back to Prolific ([www.prolific.ac](http://www.prolific.ac)) from Qualtrics (Qualtrics, Provo, UT, 2005), to complete the test and receive the reward for participating.

All results, as well as the SA pre-test results from Derksen and Nederveen (2018), were analysed in SPSS (IBM Corp., 2017). The means of the test items were calculated, and these means were used to run *t*-tests to analyse significance.

## 5. Results

The results of all three tests are displayed in Table 2.

Table 2: Means and Standard Deviations

	N	M	SD
Pre-test TS condition	30	.48	.20
Test TS condition	30	.62	.28
Test SA condition	30	.42	.14

*Test 1: Pre-test Type of Subject condition.* This pre-test was designed to create an unbiased test afterwards. All test items' answers with a lexical subjects were valued 1 and the items with pronominal subjects were valued 0. A total of 32 test items were analysed.

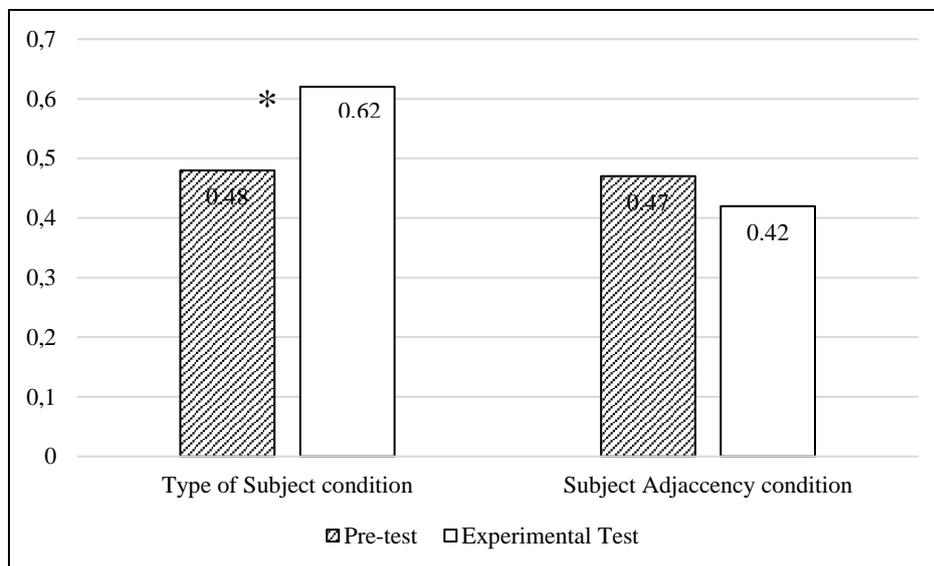
A *t*-test showed that the mean score of the pre-test did not significantly differ from .5 ( $p=.54$ ). This pre-test does not show a bias towards either lexical or pronominal subjects and can thus be used for the TS test without any alterations except for marking the verbs of the items with the -s.

*Test 2: Test Subject Adjacency condition.* The pre-test from 2018 showed a bias towards adverbs in first position (0), so some test items had to be taken out to create an unbiased test. The outliers PA-T-4/8/10/14/24/26/28/40 were taken out, because they showed a very strong bias towards either adverbs in first position (0) or in second position (1). All of the test items and their mean scores can be found in Appendix E. The deletion of these eight items made for a mean score close enough to .5 ( $M=.47$ ,  $p=.224$ ). This left a total of 28 test items for analysis in the new test (see Appendix B).

A *t*-test showed that the mean score of this test significantly differs from .5 ( $p=.004$ ). The results show a bias towards adverbials placed in first position.

*Test 3: Test Type of Subject condition.* As in the pre-test, all test items' answers with a lexical subjects were valued 1 and the items with pronominal subjects were valued 0. A total of 32 test items were analysed.

A t-test showed that the mean score of this test differed significantly from .5 ( $p=.02$ ) and from the mean score of the pre-test ( $p=.008$ ). The results show a bias towards lexical plurals as subjects. Figure 1 provides an overview of all the results, including the results of the pre-test of the SA condition (Derksen & Nederveen, 2018). The asterisk indicates a significant difference.



*Figure 1: Results pre-tests and experimental tests*

## 6. Discussion

This study was executed to see if Hoendervangers' (2016) results could be replicated by using a more watertight and reliable methodology. Hoendervangers (2016) used a ranking task in which each item consisted of four sentences to rank, and one of the four the test sentences displayed both the NSR-related TS and SA-effect. She wanted to test participants' preferences towards the two NSR-constraints, but as her test items contained more than one variable and because she did not control her test items for possible biases, her results might not say anything about the constraints of the NSR. The items of the tests in the current study had only one variable in each of the test items (the -s on the verb) for either the TS or the SA-condition, and participants were forced to choose the sentence of their preference out of only two possible answers. Slegers (2017) conducted such a more reliable research, but he tested native speakers of Danish (to examine the effect of the absence of agreement) instead of native speakers of Standard English, as Hoendervangers (2016) did. To fill this 'research gap' between Hoendervangers (2016) and Slegers (2017), the target language of this study was Standard English. To see whether or not speakers of Standard English showed sensitivities towards the NSR-related TS and SA-effect, three tests were conducted: one pre-test without the -s on the verbs (TS-condition) and two tests with the -s on the verbs (TS and SA condition). The TS pre-test was compared to the TS-test, and the SA-pre-test (Derksen & Nederveen, 2018) was compared to the SA-test to see if the -s on the verbs would trigger significant sensitivities towards the NSR. The results suggest that native speakers of Standard English are sensitive towards the TS-effect, but not towards the SA-effect.

I propose three possible explanations for the non-significant SA-condition results. Firstly, clause-oriented adverbs have rather limited positions in English. As mentioned in Section 3.2, clause-oriented adverbs are often preferred in first or central position. It follows from this that native speakers of English can have strong intuitions about adverb placement.

This study did not use any strong evaluatives in the test to minimise the number of adverbs which are strongly preferred in initial position. It was hypothesised that the sentences which did not show the SA-effect (the items valued 0) would not be preferred over the SA-effect sentences (valued 1) just because of the nature of the adverbs. As the test was designed by highly proficient, but not native, speakers of English, it is possible that the adverbs used for the SA-test were still too much preferred in first position by native speakers of English to compete with the -s on the verbs of the SA-sentences. It is possible that this test examined adverb preferences instead of sensitivities towards the NSR. A new SA-test without adverbs which could be (strongly) preferred in initial position could possibly shed more light on the results of the current study.

Secondly, the TS-constraint seems to be the most stable factor of the NSR, because this constraint was always present in NSR-dialects in Middle English and the SA-constraint was sometimes absent (as mentioned in Section 2.1). Belfast English is a modern example of this, as this variety of English has singular concord (which is similar to the NSR-related TS-effect) but it does not have a feature similar to the SA-effect. It is plausible that the occurrence of the SA-constraint declined because it was already weaker than the TS-constraint. New varieties of English might still share this core feature which is the TS-constraint. This explains why native speakers of Standard English would show a sensitivity towards the TS-effect but not towards the SA-effect.

Lastly, Slegers (2017) found that native speakers of Danish showed sensitivities towards the TS and SA-effect. Why is it the case that speakers of Danish show different sensitivities than speakers of Standard English? One could argue that the difference between the SA-results of English and Danish are due to the fact that Danish is a 'verb second' (V2) language and English is not. V2 languages have two potential subject positions outside the VP (specCP and specTP) and sensitivities towards the NSR might be due to this existence of

multiple potential subject positions. A subject does not have to sit in specCP, but it can and thus can specCP be considered to be a potential subject position. These potential subject positions can account for the difference between the SA-condition results from Slegers (2017) and the results from the current study can be accounted for. Speakers of Danish might experience the same intuitions towards the NSR as speakers of NSR-dialects, because of the existence of two potential subject positions. Middle English also had these VP-external subject positions (see example (5)). These potential subject positions might be the ‘underlying constraint’ which causes the sensitivity. English is not a V2 language and might therefore show different results than Danish. To examine whether or not the hypothesis about V2 languages having intuitions about the NSR because of multiple potential subject positions is correct, more V2 languages will have to be studied. C. Freriksen (2019)<sup>10</sup> conducted a very similar research to this current study, but with native speakers of Dutch instead of native speakers of English. Dutch is, just like Danish, a V2 language. She also examined sensitivities towards the NSR-related TS and SA-effect and used pre-tests and real tests. If both native speakers of Dutch and Danish show sensitivities where native speakers of English do not, it could be the case that the intuitions about the NSR do indeed stem from their L1 being a V2 language. Her results showed a significant result for the TS-condition ( $M=.61, p=.04$ ), and a non-significant result for the SA-condition ( $M=.45, p=.178$ ). This indicates that native speakers of Dutch only show a sensitivity towards the TS, but not towards the SA-effect. Freriksen’s (2019) experiment, however, might not be as reliable as for example Slegers’ (2017) study or the current study. During testing, the verbs marked with the -s appeared to be a problem for the participants (personal communication, 2019). Many of her participants provided feedback on the experiment and pointed out that ‘there were mistakes in the test.’ Verbs marked with a 3<sup>rd</sup> person SG -s in plural context are indeed ungrammatical in Standard English, but the participants were instructed to

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<sup>10</sup> C. Freriksen wrote an unpublished bachelor thesis, but in this thesis I will refer to her as Freriksen (2019).

choose the sentences of their preference intuitively. Many of her participants did not finish the tests because they felt like there were too many grammatical errors in them. This resulted in a struggle to find enough participants for the study. It would not be too extreme to assume that the participants who did finish the tests ( $N=17$  for TS-condition and  $N=15$  for SA-condition) ignored the -s on the verbs and judged the sentences without expressing their intuitions towards the NSR, because they seemed convinced that the -s on the verbs was an unfortunate mistake in Freriksen's (2019) tests. If this is indeed the case, the conclusion that native speakers of Dutch are sensitive towards the TS-effect and not sensitive towards the SA-effect might not be correct. To see whether or not the results from Freriksen (2019) are reliable, Dutch participants should be tested again. The instructions for the participants could possibly be altered to be more elaborate and clearer. If Freriksen's (2019) results can be replicated with more participants and instructions which are clearer, it is safer to assume that native speakers of Dutch show a sensitivity towards the NSR and that this sensitivity might be due to Dutch being a V2 language.

It was not the case that native speakers of English showed no sensitivity towards the NSR at all. The participants showed a significant bias towards the TS-sentences without ever having had any input of this kind and without English being a V2 language. This is in line with the results from Hoendervangers (2016). As proposed in Section 2.1, it might be the case that Modern English also has underlying multiple potential subject positions available outside the VP, just like Middle English had (De Haas & Van Kemenade, 2015). These potential subject positions might form the constraint which triggers a sensitivity towards the NSR. Native speakers of Standard English who show a sensitivity towards the TS-effect suggest that the existence of these two potential subject positions could possibly be the cause of the sensitivity. If this is indeed the case, the argument by Kiss (1996) that Modern English has two subject positions outside the VP might be correct, and the existence of RefP might be true. The occurrence of RefP in Modern English is currently being researched by L. Hendriks (2019).

## 7. Conclusion

This research aimed to examine whether or not native speakers of Standard English are sensitive towards the NSR-related TS and SA-effect. Hoendervangers (2016) conducted a similar study, but her methodology was flawed in such a way that her conclusion might not be reliable. That is why this study examined native speakers of Standard English like Hoendervangers (2016) did, but using a methodology similar to Slegers' (2017).

Three tests were designed: a pre-test for the TS-condition, a real test for the TS-condition, and a real test for the SA-condition (as the pre-test for the SA-condition had already been designed by Derksen and Nederveen (2018)). A pre-test was necessary to rule out any other processes to be responsible for the results than the TS and the SA-constraint. The TS pre-test showed no bias towards either of the test items, so it served as a reliable base for the real test.

Participants were asked to choose the sentence of their preference for each of the test items. All test items always had short context sentences and after these two possible answers to choose from: one item which shows either the TS or the SA-effect, and one sentence which does not. All answers had to be given intuitively.

Hoendervangers (2016) confirmed her hypothesised that participants would prefer the NSR-items over the items which did not show the NSR-constraints. Native speakers of English were sensitive towards the NSR without having had any input of this kind. Based on the results of Barbiers et al. (2018), the hypothesis for this study was the same as Hoendervangers' (2016), but the methodology of Slegers (2017) was used for the experiment.

The results of this study showed that native speakers of Standard English were sensitive towards the TS-constraint of the NSR, but not towards the SA-constraint. This suggests that the participants prefer NSR-related TS-sentences without ever having had any input of this kind. The NSR might thus be governed by principles which go beyond the input.

The significant result of the TS-constraint suggests that Modern English might have two potential subject positions available outside the VP. These multiple subject positions have been proposed earlier by Kiss (1996). The existence of these VP-external subject positions possibly form the underlying constraint that causes the sensitivity towards the NSR. The significant results also suggest that the TS-constraint is indeed the stable core of the NSR, and that new varieties of English such as e.g., Modern English and Belfast English have lost the SA-constraint but not (intuitions towards) the TS-constraint.

The non-significant result of the SA-constraint can have several causes. Firstly, it is possible that the intuitions which native speakers of Standard English have about adverb placement are too strong to be overruled by another constraint. This constraint being the NSR-related SA-constraint. When taking into account Slegers' (2017) results on native speakers of Danish and Freriksen's (2019) results on native speakers of Dutch, the idea that the NSR is governed by innate constraints grows stronger. Native speakers of Danish and Dutch also show sensitivities towards NSR-constraints.

All in all, this study showed that native speakers of Standard English are sensitive to at least one of the NSR-related constraints. This suggests that the NSR might be governed by underlying principles which go beyond the input.

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## Appendix A

### Pre-Test Type of Subject Condition

NSR - Pre-Test - English - Without s - TS condition - 27-3-2019 (Veerle)

Thank you for participating in this study!

This survey is part of a study about the perception of English sentences by native speakers of standard British English. The study is carried out by the department of English Language and Culture at Radboud University in Nijmegen.

Please note that you are only allowed to participate if the following statements are applicable to your situation: You are a native speaker of English; You are between 18-40 years old; You study or have studied at university (Bachelor or Master); You have never studied a language or linguistics in your higher education (university-level); You do not suffer from dyslexia nor any other reading disability.

Filling out the survey will take approximately 15 minutes. Please fill it out in an environment where you can concentrate. Your responses are completely anonymous. If you have any questions concerning your participation in this survey and/or the outcomes of the study, do not hesitate to contact us.

Thank you for your valuable contribution to our research!

Kind regards,

The research team

Contact:

f.wilms@student.ru.nl

Please enter your Prolific ID:

Text2 In the following section, you will be presented with pairs of 2 sentences. Sometimes these two sentences are accompanied by some context sentences. Please choose the sentence of your preference out of each pair. Note that the differences between the two sentences may be minimal. Please provide your answers intuitively.

PL-T-01 These men are very strong. The wrestling competition is next week.

- g. The men like to fight. (1)
- h. They like to fight. (0)

PL-T-02 The women often go to the restaurant. The waiter who works there is very good looking.

- A. The women like to look at good looking men. (1)
- B. They like to look at good looking men. (0)

PL-T-03 The sheep scare easily. The weather can get really bad this time of the year.

- A. The sheep run away quickly. (1)
- B. They run away quickly. (0)

PL-T-04 The puppies are very enthusiastic. My brother is a great lover of animals.

- A. The puppies play all day long. (1)
- B. They play all day long. (0)

PL-T-05 The firefighters have to act quickly. The shopping centre is on fire, but luckily...

- C. The firefighters know what to do. (1)
- D. They know what to do. (0)

PL-T-06 My cousins are a lot younger than I am. My aunt wants everyone to get along.

- A. My cousins prefer to play without me. (1)
- B. They prefer to play without me. (0)

PL-T-07 The plants are dying. The heat wave has lasted for a week now.

- A. The plants need water. (1)
- B. They need water. (0)

PL-T-08 The cows are sick. The vet has to do something quickly, because...

- A. The cows need to produce milk for the farmer. (1)
- B. They need to produce milk for the farmer. (0)

PL-T-09 The children do not know what to do anymore. The party is very boring, but not yet over.

- A. The children want to go home. (1)
- B. They want to go home. (0)

PL-T-10 The media companies only care about attention. Gossip is popular everywhere around the world.

- A. The media companies spread rumours. (1)
- B. They spread rumours. (0)

PA-C1-1 John and his friends are going to a concert. U2 is their favourite band.

- A. They love their latest record. (1)
- B. They loved their latest record. (0)

PA-C1-2 Sam and Frodo are on an important mission. They have to find a ring.

- A. It is a difficult task. (1)
- B. It was a difficult task. (2)

PA-C1-3 Nick has fallen in love with Cecile. It happened at a conference.

- A. They bond quickly. (1)
- B. They bonded quickly. (0)

PA-C1-4 Where should I go to escape the cold during Christmas break?

- A. The temperatures are highest by the sea in winter. (1)
- B. The temperatures are highest in winter by the sea. (0)

PA-C1-5 The harbour is full of ships this weekend, but...

- A. We dance all night long. (1)
- B. We danced all night long. (0)

PA-C1-6 Most people get their groceries whenever they need them.

- A. My friends always buy their food at the market for the whole week. (1)
- B. My friends always buy their food for the whole week at the market. (0)

PA-C1-7 Many students in my school consider moving to England.

- A. My classmates plan on leaving for London next summer. (1)
- B. My classmates plan on leaving next summer for London. (0)

PA-C1-8 Here's a fun fact you might not know:

- A. In Switzerland it is illegal to own just one guinea pig. (1)
- B. It is illegal to own just one guinea pig in Switzerland. (0)

PA-C1-10 The author considered staying at home, but...

- A. ... his readers want to see him at the signing today. (1)
- B. ... his readers want to see him today at the signing. (0)

PL-T-12 These cooks are very good. The restaurant is really popular.

- A. The cooks love to prepare all kinds of dishes. (1)
- B. They love to prepare all kinds of dishes. (0)

PL-T-11 My tattoos are very colourful. Many people are jealous of the back piece.

- A. My tattoos look better than those of others. (1)
- B. They look better than those of others. (0)

PL-T-13 My sisters are overweight. The doctor is pessimistic about the future.

- A. My sisters eat too much candy. (1)
- B. They eat too much candy. (0)

PL-T-14 The Christmas decorations are hanging in the tree. The living room looks very pretty now, but...

- A. The Christmas decorations break easily. (1)
- B. They break easily. (0)

PL-T-15 My colleagues are a lot of fun. The chief often brings lunch for the entire the office.

- A. My colleagues like to work with me. (1)
- B. They like to work with me. (0)

PL-T-16 Many people like to go out. The clubs in town have very strict rules.

- A. The people drink too much alcohol. (1)
- B. They drink too much alcohol. (0)

PL-T-17 The fish are swimming in the lake. Many fishermen go fishing on a boat.

- A. The fish swim away as fast as they can. (1)
- B. They swim away as fast as they can. (0)

PL-T-18 The mice eat their way through the roof. The house becomes more unstable every day.

- A. The mice hide when people try to catch them. (1)
- B. They hide when people try to catch them. (0)

PL-T-19 The bosses seem to be stressed. Many customers are unhappy with the service of the company.

- A. The bosses work hard to please everyone. (1)
- B. They work hard to please everyone. (0)

PL-T-20 The geese are walking in the sun. Summer time can get really hot outside.

- A. The geese find water to cool down in. (1)
- B. They find water to cool down in. (0)

Q301 You have completed the first half of this section. One half to go!

PA-C2-2 There must be a hole in my wallet.

- A. My coins suddenly disappear whenever I go out. (1)
- B. My coins disappear suddenly whenever I go out. (0)

PA-C2-3 The elderly need more rest than younger people.

- A. My grandparents usually sleep in the afternoon. (1)
- B. Usually my grandparents sleep in the afternoon. (0)

PA-C2-4 No wonder the sea level is rising.

- A. The icecaps rapidly melt due to global warming. (1)
- B. The icecaps melt rapidly due to global warming. (0)

PA-C2-6 Something looks odd in here.

- A. The chairs obviously belong in the other room. (1)
- B. The chairs belong in the other room obviously. (0)

PA-C2-7 The match has been going on for an hour now.

- A. The players briefly pause the game to get a drink. (1)
- B. The players pause the game briefly to get a drink. (0)

PA-C2-9 It's dangerous to drive during winter.

- A. Cars unavoidably crash on slippery roads. (1)
- B. Cars crash unavoidably on slippery roads. (0)

PA-C2-10 My books aren't very old, but I mostly read outside and...

- A. .... book covers slowly fade in the sun. (1)
- B. ... book covers fade slowly in the sun. (0)

PL-T-21 These cards are the most important thing during this game. This man can win a lot of money.

- A. The cards need to make a full house. (1)
- B. They need to make a full house. (0)

PL-T-22 These beetles are often kept as pets. The terrarium does not have to be very large.

- A. The beetles need only fruit and fresh leaves. (1)
- B. They need only fruit and fresh leaves. (0)

PL-T-23 These thieves need to be found. The police officer has been looking all day.

- A. The thieves steal from every store. (1)

B. They steal from every store. (0)

PL-T-24 These pizzas are difficult to prepare. The temperature of the oven has to be just right.

A. The pizzas burn quickly. (1)

B. They burn quickly. (0)

PL-T-25 These candles are of good quality. My neighbour is a fan of decorations.

A. These candles make an addition to every interior. (1)

B. They make an addition to every interior. (0)

PL-T-26 Cars are very expensive. Especially BMWs, but that is fair because...

A. These cars drive faster than all others. (1)

B. They drive faster than all others. (0)

PL-T-27 These flowers make a nice romantic gesture. Almost all women like such a present, because...

A. The flowers smell good. (1)

B. They smell good. (0)

PL-T-28 The years seem to fly by. Life is too short to experience everything.

A. The years go by way too fast. (1)

B. They go by way too fast. (0)

PL-T-29 The doors in this building are special. Disabled people can travel by themselves here, because...

A. the doors open automatically. (1)

B. they open automatically. (0)

PL-T-30 My feet did not look pretty. The fungal nail was treated, and...

A. My feet look good now. (1)

B. They look good now. (0)

PL-C1-1 Susie has tried a pair of sandals. She'd rather have slippers, so she asked the shopkeeper to...

A. ... take the sandals back. (1)

B. ... take back the sandals. (0)

PL-C1-2 Harry likes driving his car. When he drives alone, he...

A. ... turns the radio on. (1)

B. ... turns on the radio. (0)

PL-C1-3 John is very shy. Because of this, he doesn't dare to...

A. ... ask Emma out. (1)

B. ... ask out Emma. (0)

PL-C1-4 There was a big summer party at the park. All of my friends thought it was warm, but I wanted to...

A. ... leave my coat on. (1)

B. ... leave on my coat. (0)

PL-C1-5 My cousin arrived late. He experienced some delay, so I had to...

- A. ... pick John up at the airport. (1)
- B. ... pick up John at the airport. (0)

PL-C1-6 It was already 11pm, and John wanted to sleep. That is why he asked his roommate to...

- A. ... switch the light off. (1)
- B. ... switch off the light. (0)

PL-C1-7 The family is going through a difficult time. After the funeral, I decided to...

- A. ... cheer the children up. (1)
- B. ... cheer up the children. (0)

PL-C1-8 My little sister is really cute. She likes to play in the garden and...

- A. ... dress her dolls up. (1)
- B. ... dress up her dolls. (0)

PL-C1-9 There was an awkward moment yesterday. My colleague...

- A. ... gave the surprise party away by accident. (1)
- B. ... gave away the surprise party by accident. (0)

PL-C1-10 Julie was so happy when she finally graduated. Her parents could barely...

- A. ... hold their emotions back. (1)
- B. ... hold back their emotions. (0)

PL-T-31 The ice cubes are on the table. The sun is hottest at this time during the day.

- A. The ice cubes melt in the sun. (1)
- B. They melt in the sun. (0)

PL-T-32 These socks are my favourite. My grandmother knits all kinds of clothing.

- A. The socks make my feet warm. (1)
- B. They make my feet warm. (0)

Text4 Those were all the sentences! Only a few questions left.

Q1 What is/are your first language(s)?

- A. English (1)
- B. Other: (3) \_\_\_\_\_

Q5 What is your gender?

- A. Male (1)
- B. Female (2)
- C. Other (3)

Q6 What is your age in years?

---

Q7 What is the level of education you are currently enrolled in? If not enrolled in education at the moment, please indicate the highest level of education you have received.

- A. Primary school (1)
- B. Secondary school (2)
- C. High school (3)
- D. Vocational training (4)
- E. College (5)
- F. University Bachelor (6)
- G. University Master (7)
- H. Doctorate degree (8)
- I. Other (9)

Q5b Have you ever lived in one of the following areas? Please only count stays of over 1 month.

- A. Northern England (Cheshire, Cumbria, County Durham, Yorkshire, Manchester, Lancashire, Merseyside, Northumberland, Tyne and Wear, or Lincolnshire) (1)
- B. Scotland (2)
- C. Belfast (3)
- D. Appalachian mountain region, USA (western Pennsylvania, West Virginia, eastern Kentucky, eastern Tennessee, northern Alabama, or northern Georgia) (4)
- E. Not applicable (5)

Text5 That's it! Thank you for your valuable contribution to our research.

For questions and/or comments about this survey, please contact us at [f.wilms@student.ru.nl](mailto:f.wilms@student.ru.nl)

## Appendix B

### Test Subject Adjacency Condition

NSR - Test - English - With s on SA condition - 25-3-2019 (Veerle)

Start of Block: Introduction

Thank you for participating in this study!

This survey is part of a study about the perception of English sentences by native speakers of standard British English. The study is carried out by the department of English Language and Culture at Radboud University in Nijmegen.

Please note that you are only allowed to participate if the following statements are applicable to your situation: You are a native speaker of English; You are between 18-40 years old; You study or have studied at university (Bachelor or Master); You have never studied a language or linguistics in your higher education (university-level); You do not suffer from dyslexia nor any other reading disability.

Filling out the survey will take approximately 15 minutes. Please fill it out in an environment where you can concentrate. Your responses are completely anonymous. If you have any questions concerning your participation in this survey and/or the outcomes of the study, do not hesitate to contact us.

Thank you for your valuable contribution to our research!

Kind regards,

The research team

Contact:

f.wilms@student.ru.nl

Please enter your Prolific ID:

Text2 In the following section, you will be presented with pairs of 2 sentences. Sometimes these two sentences are accompanied by some context sentences. Please choose the sentence of your preference out of each pair. Note that the differences between the two sentences may be minimal. Please provide your answers intuitively.

PA-T-1 My twin sisters like the same things.

- A. They apparently loves mustard a lot. (1)
- B. Apparently they loves mustard a lot. (0)

PA-T-2 John's parents would like to spend more time with their son.

- A. They evidently works hard every day. (1)
- B. Evidently they works hard every day. (0)

PA-T-3

My students do not like everything they have to do.

- A. They of course hates exams. (1)
- B. Of course they hates exams. (0)

PA-T-4 I never see my neighbour's dogs at night.

- A. They probably sleeps indoors. (1)
- B. Probably they sleeps indoors. (0)

PA-T-5 Tigers don't need to survive on their own.

- A. They generally hunts in pairs. (1)
- B. Generally they hunts in pairs. (0)

PA-T-7 Children have lots of free time in their pre-school years.

- A. They typically goes to school at age 4. (1)
- B. Typically they goes to school at age 4. (0)

PA-T-8 The girls found a shop with only sweet stuff.

- A. They fortunately likes candy. (1)
- B. Fortunately they likes candy. (0)

PA-T-9 These plants won't do well in your apartment.

- A. They actually needs a bit more sunlight. (1)
- B. Actually they needs a bit more sunlight. (0)

PA-T-10 The boys won't be able to join us today.

- A. They usually goes to church on Sundays. (1)
- B. Usually they goes to church on Sundays. (0)

PA-T-11 The employees are happy with the new board.

- A. They undoubtedly agrees with this policy. (1)
- B. Undoubtedly they agrees with this policy. (0)

PA-T-12 Such traffic plans are a risky undertaking.

- A. They inevitably causes disturbances. (1)
- B. Inevitably they causes disturbances. (0)

PA-T-14 I teach my daughters to stand up for themselves.

- A. They hopefully grows into independent women. (1)
- B. Hopefully they grows into independent women. (0)

PA-T-15 It is not clear what the ministers in the new government are up to.

- A. They normally announces their plans in September. (1)
- B. Normally they announces their plans in September. (0)

PA-T-16 Buses between the seaside and the city run frequently.

- A. They officially leaves every 10 minutes. (1)
- B. Officially they leaves every 10 minutes. (0)

PA-T-17 Computers are highly recommended for this kind of work.

- A. They essentially works fast and easily. (1)
- B. Essentially they works fast and easily. (0)

PA-T-18 The actors do not show a lot of affection for each other on screen.

- A. They unquestionably hates each other in real life. (1)
- B. Unquestionably they hates each other in real life. (0)

PA-T-19 I didn't understand these out-of-the-blue questions at first.

- A. They certainly makes sense in context. (1)
- B. Certainly they makes sense in context. (0)

PA-T-20 The attacks were condemned by the public

- A. They arguably poses a great threat to the country. (1)
- B. Arguably they poses a great threat to the country. (0)

PA-C1-1 Most university staff doesn't bring lunch to work.

- A. The professors eat in the cafeteria every day. (1)
- B. The professors eat every day in the cafeteria. (0)

PA-C1-2 I don't like to have my pets with me when I'm in bed, so...

- A. ... the cats sleep on the sofa at night. (1)
- B. ... the cats sleep at night on the sofa. (2)

PA-C1-3 We had singer-songwriters performing on the square last week.

- A. The bands play in this bar next Tuesday. (1)
- B. The bands play next Tuesday in this bar. (0)

PA-C1-4 Where should I go to escape the cold during Christmas break?

- A. The temperatures are highest by the sea in winter. (1)
- B. The temperatures are highest in winter by the sea. (0)

PA-C1-5 The harbour is full of ships this weekend, but...

- A. .... these boats sail to England on Monday. (1)
- B. ....these boats sail on Monday to England. (0)

PA-C1-6 Most people get their groceries whenever they need them.

- A. My friends always buy their food at the market on Tuesdays. (1)
- B. My friends always buy their food on Tuesdays at the market. (0)

PA-C1-7 Many students in my school consider moving to England.

- A. My classmates want to live in London next year. (1)
- B. My classmates want to live next year in London. (0)

PA-C1-8 Here's a fun fact you might not know:

- A. Dolphins swim in shallow water during winter. (1)
- B. Dolphins swim during winter in shallow water. (0)

PA-C1-10 The author considered staying at home, but...

- A. ... his readers want to see him at the signing today. (1)
- B. ... his readers want to see him today at the signing. (0)

PA-C2-2 There must be a hole in my wallet.

- A. My coins suddenly disappear whenever I go out. (1)

B. My coins disappear suddenly whenever I go out. (0)

PA-C2-3 The elderly need more rest than younger people.

A. My grandparents usually sleep in the afternoon. (1)

B. My grandparents sleep in the afternoon usually. (0)

PA-C2-4 No wonder the sea level is rising.

A. The icecaps rapidly melt due to global warming. (1)

B. The icecaps melt rapidly due to global warming. (0)

PA-C2-6 Something looks odd in here.

A. The chairs obviously belong in the other room. (1)

B. The chairs belong in the other room obviously. (0)

PA-C2-7 The match has been going on for an hour now.

A. The players briefly pause the game to get a drink. (1)

B. The players pause the game briefly to get a drink. (0)

PA-C2-9 It's dangerous to drive in winter.

A. Cars unavoidably crash on slippery roads. (1)

B. Cars crash unavoidably on slippery roads. (0)

PA-C2-10 My books aren't very old, but I mostly read outside and...

A. .... book covers slowly fade in the sun. (1)

B. ... book covers fade slowly in the sun. (0)

PA-T-21 These soft drinks are not good for your health.

A. They no doubt contains a lot of artificial ingredients. (1)

B. No doubt they contains a lot of artificial ingredients. (0)

PA-T-22 Aaron and John love James Bond movies.

A. They regrettably finds the cinema closed on their day off. (1)

B. Regrettably they finds the cinema closed on their day off. (0)

PA-T-23 The neighbours do not strike me as Christians.

A. They maybe believes in another religion. (1)

B. Maybe they believes in another religion. (0)

PA-T-24 My friends all love to swim a lot.

A. They luckily lives close to the coast. (1)

B. Luckily they lives close to the coast. (0)

PA-T-25 Italians do not consume a lot of beer on a yearly basis.

A. They perhaps likes wine much better. (1)

B. Perhaps they likes wine much better. (0)

PA-T-26 The two lawyers are looking forward to the trial.

A. They in fact believes that they will win this case. (1)

B. In fact they believes that they will win this case. (0)

PA-T-27 These birds are known for their monogamous behaviour.

- A. They typically stays together their whole lives. (1)
- B. Typically they stays together their whole lives. (0)

PA-T-28 Alice and Denise would love to be part of this singing contest.

- A. They unfortunately lacks the required talent. (1)
- B. Unfortunately they lacks the required talent. (0)

PA-T-29 Three police officers arrived at the scene.

- A. They hopefully recognizes how delicate the situation is. (1)
- B. Hopefully they recognizes how delicate the situation is. (0)

Q265 You have completed the first half of this section. One half to go!

PA-T-30 The customers were told that they have to show their passports.

- A. They frankly fails to see why this is necessary. (1)
- B. Frankly they fails to see why this is necessary. (0)

PA-T-31 Many kids are overweight these days.

- A. They honestly eats too much. (1)
- B. Honestly they eats too much. (0)

PA-T-32 The technicians don't like to exercise, but...

- A. ... they occasionally runs to catch the train. (1)
- B. ... occasionally they runs to catch the train. (0)

PA-T-34 The team members practiced all summer.

- A. They predictably looks forward to the new season. (1)
- B. Predictably they looks forward to the new season. (0)

PA-T-35 The Dutch boys look ridiculous.

- A. They traditionally wears orange on King's Day. (1)
- B. Traditionally they wears orange on King's Day. (0)

PA-T-36 These old men don't look very healthy to me.

- A. They quite likely drinks vodka every day. (1)
- B. Quite likely they drinks vodka every day. (0)

PA-T-37 The brothers drive very recklessly.

- A. They most likely makes use of their car insurance all the time. (1)
- B. Most likely they makes use of their car insurance all the time. (0)

PA-T-39 The professors are attending a conference.

- A. They conventionally wears a suit for their own lecture. (1)
- B. Conventionally they wears a suit for their own lecture. (0)

PA-T-40 Some friends won tickets for a heavy-metal concert.

- A. They ironically thinks that kind of music is terrible. (1)
- B. Ironically they thinks that kind of music is terrible. (0)

PL-C1-1 Susie has tried a pair of sandals. She'd rather have slippers, so she asked the shopkeeper to...

- A. ... take the sandals back. (1)
- B. ... take back the sandals. (0)

PL-C1-2 Harry likes driving his car. When he drives alone, he...

- A. ... turns the radio on. (1)
- B. ... turns on the radio. (0)

PL-C1-3 John is very shy. Because of this, he doesn't dare to...

- A. ... ask Emma out. (1)
- B. ... ask out Emma. (0)

PL-C1-4 There was a big summer party at the park. All of my friends thought it was warm, but I wanted to...

- A. ... leave my coat on. (1)
- B. ... leave on my coat. (0)

PL-C1-5 My cousin arrived late. He experienced some delay, so I had to...

- A. ... pick John up at the airport. (1)
- B. ... pick up John at the airport. (0)

PL-C1-6 It was already 11pm, and John wanted to sleep. That is why he asked his roommate to...

- A. ... switch the light off. (1)
- B. ... switch off the light. (0)

PL-C1-7 The family is going through a difficult time. After the funeral, I decided to...

- A. ... cheer the children up. (1)
- B. ... cheer up the children. (0)

PL-C1-8 My little sister is really cute. She likes to play in the garden and...

- A. ... dress her dolls up. (1)
- B. ... dress up her dolls. (0)

PL-C1-9 There was an awkward moment yesterday. My colleague...

- A. ... gave the surprise party away by accident. (1)
- B. ... gave away the surprise party by accident. (0)

PL-C1-10 Julie was so happy when she finally graduated. Her parents could barely...

- A. ... hold their emotions back. (1)
- B. ... hold back their emotions. (0)

PL-C2-1 Romy went to the movies yesterday. The new James Bond had just been released.

- A. Romy really likes the movie. (1)
- B. Romy really liked the movie. (0)

PL-C2-2 Benjamin is in need of a haircut, but he finds a hairdresser too expensive.

- A. Therefore he does it himself. (1)
- B. Therefore he did it himself. (0)

PL-C2-3 Mary made tea for the kids. The kids were still playing outside so she had to call them.

- A. Mary hates to see the tea get cold. (1)
- B. Mary hated to see the tea get cold. (0)

PL-C2-4 Alex had tidied up the room. It was a complete mess.

- A. Alex feels really happy with himself. (1)
- B. Alex felt really happy with himself. (0)

PL-C2-5 The boys are playing football in the yard. Sundays are always centred around sports.

- A. The boys really like to play football. (1)
- B. The boys really liked to play football. (0)

PL-C2-6 Tom, get in your seat! The principal arrives soon.

- A. By the way, do these books belong to you? (1)
- B. By the way, did these books belong to you? (0)

PL-C2-7 Margaret took my arm, I don't know how it happened.

- A. We dance all night long. (1)
- B. We danced all night long. (0)

PL-C2-8 Nick has fallen in love with Cecile. It happened at a conference.

- A. They bond quickly. (1)
- B. They bonded quickly. (0)

PL-C2-9 Sam and Frodo are on an important mission. They have to find a ring.

- A. It is a difficult task. (1)
- B. It was a difficult task. (0)

PL-C2-19 John and his friends are going to a concert. U2 is their favourite band.

- A. They love their latest record. (1)
- B. They loved their latest record. (0)

PL-T-1 My feet are always cold. Weirdly enough even during the summer.

- A. My feet need at least three layers of socks to be warm. (1)
- B. They need at least three layers of socks to be warm. (0)

PL-T-2 The dogs seem to be having a great time. It is raining terribly, but...

- A. the dogs love running around. (1)
- B. they love running around. (0)

PL-T-3 These bacteria easily cause an epidemic. Many people are already struck.

- A. The bacteria spread rapidly. (1)
- B. They spread rapidly. (0)

PL-T-4 The trees were planted 15 years ago. The forest looks beautiful now.

- A. The trees grow taller every year. (1)
- B. They grow taller every year. (0)

PL-T-5 Look at the children! The party is a success.

- A. The children like candy. (1)
- B. They like candy. (0)

PL-T-6 The women in this town rarely come here. The shopping centre is always empty.

- A. The women prefer busier places. (1)
- B. They prefer busier places. (0)

PL-T-7 The businessmen always seem in a hurry. Wall Street is a good place for making money.

- A. The businessmen work around the clock. (1)
- B. They work around the clock. (0)

PL-T-8 My grandchildren make me feel young again. Not everyone is as lucky as I am.

- A. My grandchildren visit every Sunday. (1)
- B. They visit every Sunday. (0)

PL-T-9 The farmers are going through a tough time. The demand for produce grows every year, and ...

- A. the farmers need to work very hard. (1)
- B. they need to work very hard. (0)

PL-T-10 The girls are shopping. The weather has suddenly changed, so ...

- A. the girls need new shoes. (1)
- B. they need new shoes. (0)

PL-T-11 Those schools normally have strict schedules. The weather is very hot for this time of year, so ...

- A. the schools close early today. (1)
- B. they close early today. (0)

PL-T-12 These spokeswomen are very important to our organisation. One mistake can be fatal.

- A. The spokeswomen need to tread carefully. (1)
- B. They need to tread carefully. (0)

PL-T-13 These shoes look very good on John. Money is not an issue for him.

- A. The shoes seem to be made of expensive leather. (1)
- B. They seem to be made of expensive leather. (0)

PL-T-14 My teeth need a lot of care. Going to the dentist is expensive, but ...

- A. my teeth look good now. (1)
- B. they look good now. (0)

Text4 Those were all the sentences! Only a few questions left.

Q1 What is/are your first language(s)?

- A. English (1)
- B. Other: (3) \_\_\_\_\_

Q5 What is your gender?

- A. Male (1)
- B. Female (2)
- C. Other (3)

Q6 What is your age in years?

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Q7 What is the level of education you are currently enrolled in? If not enrolled in education at the moment, please indicate the highest level of education you have received.

- A. Primary school (1)
- B. Secondary school (2)
- C. High school (3)
- D. Vocational training (4)
- E. College (5)
- F. University Bachelor (6)
- G. University Master (7)
- H. Doctorate degree (8)
- I. Other (9)

Q5b Have you ever lived in one of the following areas? Please only count stays of over 1 month.

- A. Northern England (Cheshire, Cumbria, County Durham, Yorkshire, Manchester, Lancashire, Merseyside, Northumberland, Tyne and Wear, or Lincolnshire) (1)
- B. Scotland (2)
- C. Belfast (3)
- D. Appalachian mountain region, USA (western Pennsylvania, West Virginia, eastern Kentucky, eastern Tennessee, northern Alabama, or northern Georgia) (4)
- E. Not applicable (5)

Text5 That's it! Thank you for your valuable contribution to our research.

For questions and/or comments about this survey, please contact us at [f.wilms@student.ru.nl](mailto:f.wilms@student.ru.nl)

## Appendix C

### Test Type of Subject Condition – test items

NSR - Test - English - With s - TS condition - 25-5-2019 (Veerle) - Copy of Pre-Test

PL-T-01 These men are very strong. The wrestling competition is next week.

- i. The men likes to fight. (1)
- j. They likes to fight. (0)

PL-T-02 The women often go to the restaurant. The waiter who works there is very good looking.

- C. The women likes to look at good looking men. (1)
- D. They likes to look at good looking men. (0)

PL-T-03 The sheep scare easily. The weather can get really bad this time of the year.

- C. The sheep runs away quickly. (1)
- D. They runs away quickly. (0)

PL-T-04 The puppies are very enthusiastic. My brother is a great lover of animals.

- C. The puppies plays all day long. (1)
- D. They plays all day long. (0)

PL-T-05 The firefighters have to act quickly. The shopping centre is on fire, but luckily...

- E. The firefighters knows what to do. (1)
- F. They knows what to do. (0)

PL-T-06 My cousins are a lot younger than I am. My aunt wants everyone to get along.

- C. My cousins prefers to play without me. (1)
- D. They prefers to play without me. (0)

PL-T-07 The plants are dying. The heat wave has lasted for a week now.

- C. The plants needs water. (1)
- D. They needs water. (0)

PL-T-08 The cows are sick. The vet has to do something quickly, because...

- C. The cows needs to produce milk for the farmer. (1)
- D. They needs to produce milk for the farmer. (0)

PL-T-09 The children do not know what to do anymore. The party is very boring, but not yet over.

- C. The children wants to go home. (1)
- D. They wants to go home. (0)

PL-T-10 The media companies only care about attention. Gossip is popular everywhere around the world.

- C. The media companies spreads rumours. (1)
- D. They spreads rumours. (0)

PL-T-12 These cooks are very good. The restaurant is really popular.

- C. The cooks loves to prepare all kinds of dishes. (1)
- D. They loves to prepare all kinds of dishes. (0)

PL-T-11 My tattoos are very colourful. Many people are jealous of the back piece.

- C. My tattoos looks better than those of others. (1)
- D. They looks better than those of others. (0)

PL-T-13 My sisters are overweight. The doctor is pessimistic about the future.

- C. My sisters eats too much candy. (1)
- D. They eats too much candy. (0)

PL-T-14 The Christmas decorations are hanging in the tree. The living room looks very pretty now, but...

- C. The Christmas decorations breaks easily. (1)
- D. They breaks easily. (0)

PL-T-15 My colleagues are a lot of fun. The chief often brings lunch for the entire the office.

- C. My colleagues likes to work with me. (1)
- D. They likes to work with me. (0)

PL-T-16 Many people like to go out. The clubs in town have very strict rules.

- C. The people drinks too much alcohol. (1)
- D. They drinks too much alcohol. (0)

PL-T-17 The fish are swimming in the lake. Many fishermen go fishing on a boat.

- C. The fish swims away as fast as they can. (1)
- D. They swims away as fast as they can. (0)

PL-T-18 The mice eat their way through the roof. The house becomes more unstable every day.

- C. The mice hides when people try to catch them. (1)
- D. They hides when people try to catch them. (0)

PL-T-19 The bosses seem to be stressed. Many customers are unhappy with the service of the company.

- C. The bosses works hard to please everyone. (1)
- D. They works hard to please everyone. (0)

PL-T-20 The geese are walking in the sun. Summer time can get really hot outside.

- C. The geese finds water to cool down in. (1)
- D. They finds water to cool down in. (0)

PL-T-21 These cards are the most important thing during this game. This man can win a lot of money.

- C. The cards needs to make a full house. (1)
- D. They needs to make a full house. (0)

PL-T-22 These beetles are often kept as pets. The terrarium does not have to be very large.

- C. The beetles needs only fruit and fresh leaves. (1)
- D. They needs only fruit and fresh leaves. (0)

PL-T-23 These thieves need to be found. The police officer has been looking all day.

- C. The thieves steals from every store. (1)
- D. They steals from every store. (0)

PL-T-24 These pizzas are difficult to prepare. The temperature of the oven has to be just right.

- C. The pizzas burns quickly. (1)
- D. They burns quickly. (0)

PL-T-25 These candles are of good quality. My neighbour is a fan of decorations.

- C. These candles makes an addition to every interior. (1)
- D. They makes an addition to every interior. (0)

PL-T-26 Cars are very expensive. Especially BMWs, but that is fair because...

- C. These cars drives faster than all others. (1)
- D. They drives faster than all others. (0)

PL-T-27 These flowers make a nice romantic gesture. Almost all women like such a present, because...

- C. The flowers smells good. (1)
- D. They smells good. (0)

PL-T-28 The years seem to fly by. Life is too short to experience everything.

- C. The years goes by way too fast. (1)
- D. They goes by way too fast. (0)

PL-T-29 The doors in this building are special. Disabled people can travel by themselves here, because...

- C. the doors opens automatically. (1)
- D. they opens automatically. (0)

PL-T-30 My feet did not look pretty. The fungal nail was treated, and...

- C. My feet looks good now. (1)
- D. They looks good now. (0)

PL-T-31 The ice cubes are on the table. The sun is hottest at this time during the day.

- C. The ice cubes melts in the sun. (1)
- D. They melts in the sun. (0)

PL-T-32 These socks are my favourite. My grandmother knits all kinds of clothing.

- C. The socks makes my feet warm. (1)
- D. They makes my feet warm. (0)

## Appendix D

### Pre-screening

1. Age: 18 - 40
2. Nationality: UK
3. First Language: English
4. Literacy Difficulties: no
5. Were you raised monolingual? Yes
6. Current level of education: Graduate, Undergraduate, Doctorate
7. Subjects of study: only excluded options are English Language and Languages, included Classics and English Literature
8. Highest attained education, allowed options: College A-levels (because they are at the same level that our students are when they enter university, according to AvK), Graduate, Undergraduate, Doctorate
9. UK area of birth: allowed options -
  - East Midlands, England (Derbyshire and Nottinghamshire, Leicestershire, Rutland and Northamptonshire, Lincolnshire)
  - West Midlands, England (Herefordshire, Worcestershire and Warwickshire, Shropshire and Staffordshire, West Midlands)
  - East of England (East Anglia, Bedfordshire and Hertfordshire, Essex)
  - South East, England (Berkshire, Buckinghamshire, and Oxfordshire, Surrey, Sussex, Kent, Hampshire and Isle of Wight)
  - South West, England (Gloucestershire, Wiltshire and Bristol/Bath area, Dorset and Somerset, Cornwall and Isles of Scilly, Devon)
10. Current UK area of residence: allowed options -
  - East Midlands, England (Derbyshire and Nottinghamshire, Leicestershire, Rutland and Northamptonshire, Lincolnshire)
  - West Midlands, England (Herefordshire, Worcestershire and Warwickshire, Shropshire and Staffordshire, West Midlands)
  - East of England (East Anglia, Bedfordshire and Hertfordshire, Essex)
  - South East, England (Berkshire, Buckinghamshire, and Oxfordshire, Surrey, Sussex, Kent, Hampshire and Isle of Wight)
  - South West, England (Gloucestershire, Wiltshire and Bristol/Bath area, Dorset and Somerset, Cornwall and Isles of Scilly, Devon)

## Appendix E

### Results pre-test Type of Subject condition (Derksen & Nederveen, 2018)

#### *Descriptive Statistics Lexicality Condition*

Test sentence	N	Minimum 0	Maximum 1	M	SD
My feet are always cold. Weirdly enough even during the summer.	36	They need at least three layers of socks to be warm	My feet need at least three layers of socks to be warm	0,31	0,467
The dogs seem to be having a great time. It is raining terribly, but...	36	they love running around	the dogs love running around	0,19	0,401
These bacteria easily cause an epidemic. Many people are already struck.	36	They spread rapidly	The bacteria spread rapidly	0,67	0,478
The trees were planted 15 years ago. The forest looks beautiful now.	36	They grow taller every year	The trees grow taller every year	0,44	0,504
Look at the children! The party is a success.	36	They like candy	The children like candy	0,36	0,487
The women in this town rarely come here. The shopping centre is always empty.	36	They prefer busier places	The women prefer busier places	0,17	0,378
The businessmen always seem in a hurry. Wall Street is a good place for making money.	36	They work around the clock	The businessmen work around the clock	0,39	0,494
My grandchildren make me feel young again. Not everyone is as lucky as I am.	36	They visit every Sunday	My grandchildren visit every Sunday	0,31	0,467
The farmers are going through a tough time. The demand for produce grows every year, and ...	36	the farmers need to work very hard	they need to work very hard	0,33	0,478
The girls are shopping. The weather has suddenly changed, so ...	36	the girls need new shoes	They need new shoes	0,08	0,280
Those schools normally have strict schedules. The weather is very hot for this time of year, so ...	36	They close early today	the schools close early today	0,33	0,478

These spokeswomen are very important to our organisation. One mistake can be fatal.	36	They need to tread carefully	The spokeswomen need to tread carefully	0,31	0,467
These shoes look very good on John. Money is not an issue for him.	36	They seem to be made of expensive leather	The shoes seem to be made of expensive leather	0,39	0,494
My teeth need a lot of care. Going to the dentist is expensive, but ...	36	They look good now	my teeth look good now	0,53	0,506
Valid N (listwise)	36				

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## Appendix F

### Results pre-test Subject Adjacency condition (Derksen & Nederveen, 2018)

#### *Descriptive Statistics Adverbial Condition*

Test Sentence	N	Minimum 0	Maximum 1	M	SD
My twin sisters like the same things.	36	Apparently they love mustard a lot.	They apparently love mustard a lot.	0,25	0,439
John's parents would like to spend more time with their son.	36	Evidently they work hard every day	They evidently work hard every day	0,33	0,478
My students do not like everything they have to do.	36	Of course they hate exams	They of course hate exams	0,56	0,504
I never see my neighbour's dogs at night.	36	Probably they sleep indoors	They probably sleep indoors	0,94	0,232
Tigers don't need to survive on their own.	36	Generally they hunt in pairs	They generally hunt in pairs	0,56	0,504
Children have lots of free time in their pre-school years.	36	Typically they go to school at age 4	They typically go to school at age 4	0,56	0,504
The girls found a shop with only sweet stuff.	36	Fortunately they like candy	They fortunately like candy	0,08	0,280
These plants won't do well in your apartment.	36	Actually they need a bit more sunlight	They actually need a bit more sunlight	0,81	0,401
The boys won't be able to join us today.	36	Usually they go to church on Sundays	They usually go to church on Sundays	0,89	0,319
The employees are happy with the new board.	36	Undoubtedly they agree with this policy	They undoubtedly agree with this policy	0,53	0,506
Such traffic plans are a risky undertaking.	36	Inevitably they cause disturbances	They inevitably cause disturbances	0,58	0,500
I teach my daughters to stand up for themselves.	36	Hopefully they grow into independent women	They hopefully grow into independent women	0,14	0,351
It is not clear what the ministers in the new government are up to.	36	Normally they announce their plans in September	They normally announce their plans in September	0,58	0,500
Buses between the seaside and the city run frequently.	36	Officially they leave every 10 minutes	They officially leave every 10 minutes	0,36	0,487

Computers are highly recommended for this kind of work.	36	Essentially they work fast and easily	They essentially work fast and easily	0,39	0,494
The actors do not show a lot of affection for each other on screen.	36	Unquestionably they hate each other in real life	They unquestionably hate each other in real life	0,67	0,478
I didn't understand these out-of-the-blue questions at first.	36	Certainly they make sense in context	They certainly make sense in context	0,83	0,378
The attacks were condemned by the public	36	Arguably they pose a great threat to the country	They arguably pose a great threat to the country	0,39	0,494
These soft drinks are not good for your health.	36	No doubt they contain a lot of artificial	They no doubt contain a lot of artificial ingredients	0,47	0,506
Aaron and John love James Bond movies.	36	Regrettably they find the cinema close.	They regrettably find the cinema closed on their day off	0,31	0,467
The neighbours do not strike me as Christians.	36	Maybe they believe in another religion	They maybe believe in another religion	0,17	0,378
My friends all love to swim a lot.	36	Luckily they live close to the coast	They luckily live close to the coast	0,11	0,319
Italians do not consume a lot of beer on a yearly basis.	36	Perhaps they like wine much better	They perhaps like wine much better	0,28	0,454
The two lawyers are looking forward to the trial.	36	In fact they believe that they will win this	They in fact believe that they will win this case	0,11	0,319
These birds are known for their monogamous behaviour.	36	Typically they stay together their whole lives	They typically stay together their whole lives	0,58	0,500
Alice and Denise would love to be part of this singing contest.	36	Unfortunately they lack the required talent	They unfortunately lack the required talent	0,14	0,351
Three police officers arrived at the scene.	36	Hopefully they recognize how delicate th...)	They hopefully recognize how delicate the situation is	0,17	0,378
The customers were told that they have to show their passports.	36	Frankly they fail to see why this is necessary	They frankly fail to see why this is necessary	0,22	0,422

Many kids are overweight these days.	36	Honestly they eat too much	They honestly eat too much	0,42	0,500
The technicians don't like to exercise, but...	36	... occasionally they run to catch the train	(... they occasionally run to catch the train	0,50	0,507
The team members practiced all summer.	36	Predictably they look forward to the new season	They predictably look forward to the new season	0,33	0,478
The Dutch boys look ridiculous.	36	Traditionally they wear orange on King's Day	They traditionally wear orange on King's Day	0,33	0,478
These old men don't look very healthy to me.	36	Quite likely they drink vodka every day	They quite likely drink vodka every day	0,78	0,422
The brothers drive very recklessly.	36	Most likely they make use of their...)	They most likely make use of their car insurance all the time	0,78	0,422
The professors are attending a conference.	36	Conventionally they wear a suit for their...)	They conventionally wear a suit for their own lecture	0,36	0,487
Some friends won tickets for a heavy-metal concert.	36	Ironically they think that kind of music i...)	They ironically think that kind of music is terrible	0,08	0,280
Valid N (listwise)	36				

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