

HEN versus ZE

A research on the semantic distinction between 3rd person plural pronouns *hen* and *ze*

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Inhoud

| | |
|---|----|
| 1. Theoretical framework | 5 |
| 1.1 Introduction | 5 |
| 1.2 Theoretical background..... | 6 |
| 1.2.1 The pronominal system of Dutch | 6 |
| 1.2.2 3rd person pronouns throughout the years | 7 |
| 1.3 Acquisition of personal pronouns | 9 |
| 1.3.1 Difficulties with the acquisition of pronouns | 9 |
| 1.3.2 Relative complexity..... | 11 |
| 1.4 Summary | 14 |
| 2. Research Question and Hypothesis | 14 |
| 3. Methodology | 15 |
| 3.1 Introduction | 15 |
| 3.2 Subjects | 15 |
| 3.2.1 Children..... | 15 |
| 3.2.2 Adults | 15 |
| 3.3 Design and procedure HEN-EXP..... | 16 |
| 3.3.1 Puppet and Set up..... | 19 |
| 3.3.2 TVJ..... | 21 |
| 3.3.3 Practice story | 21 |
| 3.3.4 First story..... | 23 |
| 3.3.5 Second story | 26 |
| 3.3.6 Third story | 28 |
| 3.3.7 T/F, filler and OF items..... | 30 |
| 4. Results | 32 |
| 4.1 Control Conditions | 32 |
| 4.2 Child Test Conditions..... | 34 |

| | |
|---|----|
| 4.2.1 ZF | 34 |
| 4.2.2 ZA..... | 34 |
| 4.2.3 HF..... | 35 |
| 4.3 Adult Test Conditions | 36 |
| 4.3.1 ZF | 37 |
| 4.3.2 ZA..... | 37 |
| 4.3.3 HF..... | 38 |
| 4.3.4 HF Utrecht adults | 39 |
| 4.3.5 Sex..... | 40 |
| 5. Discussion | 40 |
| 5.1 Interpretation of Results | 40 |
| 5.2 New Hypothesis | 41 |
| 5.2 Follow-up, suggested improvements and additions | 42 |
| 6. Conclusion..... | 44 |
| 7. Works cited | 46 |
| 8. Appendix | 50 |
| 8.1 Dutch pronoun paradigm..... | 50 |
| 8.2 Data | 50 |
| Legend..... | 50 |
| Table 1. Results HEN-EXP children..... | 50 |
| Table 2.1 Results HEN-EXP adults | 52 |
| Table 2.2 Results HEN-EXP adults from Utrecht and surrounding areas | 53 |
| Table 3.1 Control data of child subjects with unexpected HF TVJ | 54 |
| Table 3.2 Test data of child subjects with unexpected HF TVJ..... | 54 |
| Table 3.3 Test data of adult subjects with unexpected HF TVJ..... | 55 |
| Table 4.1 Data F control-items child HEN-EXP..... | 56 |
| Table 4.2 Data T control-items child HEN-EXP | 57 |

| | |
|---------------------------------|----|
| 8.3 Materials..... | 58 |
| 8.3.1 Practice story | 58 |
| 8.3.2 Suzanne | 64 |
| 8.3.3 Tom | 67 |
| 8.3.4 Moeder | 69 |
| 8.3.5 Filler items..... | 73 |
| 8.3.6 Puppet answer sheet | 82 |
| 8.3.7 Adult answer sheet | 83 |

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1. Theoretical framework

1.1 Introduction

A linguistic *hot topic* in the present-day Dutch society is the subjectival use of the objectival 3rd plural pronoun *hun* in sentences such as (1) (Cornips 47-48).

(1) Hun hebben de kleren nog niet naar het politie-bureau gebracht

(1) *They [ACC] have not brought the clothes to the police station*

Discounted as language deterioration by language purists and welcomed as an interesting linguistic phenomenon by many linguists, this ongoing shift in the Dutch pronominal system has led to many discussions and a surge in linguistic research into this topic. The Dutch pronominal system, however, has other features worth investigating at a time that seems to be a turning point in the Dutch language as far as personal pronouns are concerned.

The research described in this thesis deals with one of these features: the semantic distinction between the two Dutch 3rd person plural pronouns: *ze* and *hen*. Although both personal pronouns can be used in the same syntactical functions, the use of the reduced pronoun *ze* is more diverse. Whereas *hen* can only have a human antecedent, *ze* can refer to humans, animals or objects (Haeseryn 247-8). This discrepancy between *hen* and *ze* can be brought down to the semantic feature [human], with *hen* being restricted to a [+human] context (Bagha 1416). Sentences (2) and (3) give an example of this feature of Dutch:

(2) Waar zijn je broertjes? *Where are your brothers? [+ human]*

a. Ik heb ze niet gezien *I have not seen them [+/- human]*

b. Ik heb hen niet gezien *I have not seen them [+ human]*

(3) Waar zijn de boeken? *Where are the books? [- human]*

a. Ik heb ze niet gezien *I have not seen them [+/- human]*

b. *Ik heb hen niet gezien *I have not seen them [+ human]*

With the brothers in (2) being [+human], both answers a. and b. are correct. Question (3), however, refers to books, inanimate things, and thus contains a [-human] antecedent. Answer a. is still correct, since *ze* can refer to a [-human] unit. Answer b., on the other hand, is

incorrect, due to a mismatch between the [+human] feature of *hen* and the [-human] feature of *boeken*.

This thesis deals with the sensitivity to and comprehension of this semantic distinction between *hen* and *ze* by Dutch children and adults. This first chapter reviews the theoretical background that stands at the basis of this study. Chapter 2 contains the hypothesis which was made on the basis of this theoretical background, followed by an overview of the methodology used in the experiment in chapter 3. Thereafter will follow a summary and discussion of the generated results, which will be linked to the hypothesis posed at the start.

1.2 Theoretical background

1.2.1 The pronominal system of Dutch

The Dutch language distinguishes between 9 categories of pronouns¹ of which the personal pronoun is one (Haeseryn 230). The personal pronouns themselves are then subdivided by person (1st, 2nd and 3rd), number (singular, plural), syntactic function (subject-form, non-subjectform), emphasis (full, reduced), formality (formal, informal) and gender (male, female, neuter), leading to a total of about 24 phonologically distinguishable personal pronouns² in the Dutch pronoun "paradigm" (see appendix 7.1) (Haeseryn 236; Wales 13). There is no "regular inflection system" that helps speakers of Dutch derive the various pronouns in the paradigm, although some forms are "analy[z]able into elements," such as the initial letter *j*-seems to define the 2nd person pronouns (Howe 18-20).

As Wales points out, a personal pronoun has a "stylistic function" in that it "substitute[s] for a noun or noun phrase" and so prevents "repetition of [that] noun or NP" (1-2). The sentence below, in which *Babar* is replaced by the pronoun *he*, is an example of such a substitution:

(4) "Babar grew fast. Soon *he* was playing with the other baby elephants. *He* was one of the nicest of them. (qtd. in Wales 2).

¹ personal pronouns, reflexive pronouns, reciprocal pronouns, possessive pronouns, demonstrative pronouns, interrogative pronouns, relative pronouns, indefinite pronouns and exclamatory pronouns.

² ik, 'k, mij, me, jij, je, jou, u, hij, hem, ie, 'm, zij, ze, haar, d'r, het, 't, wij, we, ons, jullie, hen, hun. Some forms fulfil multiple functions.

Substitutions can be either "endophoric" or "exophoric," which means the object or person that is referred to may either be specified in the text in which the pronoun occurs or it may not (qtd. in Wales 2).

1.2.2 3rd person pronouns throughout the years

In 1625 van Heule prescribed de/(pre)scribes the grammar of Dutch and the distinction between different pronouns such as “zy” and “hen” for the first time (35). His paradigm shows a clear distinction between pronouns by number and case. The pronoun “zy” (over time degenerated into “ze”) is used when needing a “noemer,” or nominative case, 3rd person plural pronoun. “Hun” is used for “gever” (dative case) and “ofnemer” (ablative) and “hen” is “aenklager,” or accusative case. Heule was the first grammarian to prescribe the artificial distinction between the dative and accusative 3rd person plural pronouns *hun* and *hen* which still leads to much confusion by speakers of Modern Dutch (Howe 219)³.

Fig. 1 Copy and transcript of Christiaan van Heule's *De Nederduytsche Grammatica ofte Spraec-konst* (1625)

Merk.

By onze Voorouders / zo heeft men *Du*¹⁾ gebruykt in de plaetse van *Gy*, ende het wordeken *Gy*, beteykende zo veel als *Gy lieden* tegenwoordich doet / dit gebruyk verhaelt²⁾ de Beroemden³⁾ Aldegonde in zijne Psalmen / waer in hy ook getracht heeft / die woorden tot haer out gebruyk te brengen / ende alhoewel zulx in reden gegront is / ende de noot zulx in onze Taaele wel vereyscht / zo wort dit als verworpen / buyten het gebruyk gelaten.⁴⁾

Wij hebben hier boven *Gy lij* gestelt in de plaetse daer men *Gy lieden* is gewoon te zeggen / om dat het woort *Gy lieden* zeer lang by de Werkwoorden *valt / ende om dat *Gy lij* ook by de Oude Nederlanders gebruykt is geweest.⁵⁾ * Siet Pontus de Heviter.

| | Eenvoudig. | Veelvoudig. |
|----|------------------------------|-------------------------------|
| N. | <i>Hy IPSE</i> ⁶⁾ | <i>Zy ofte Zylieden IPSI.</i> |
| B. | <i>Zijns, Zijnes</i> | <i>Haerer</i> |
| G. | <i>Hem</i> | <i>Hun</i> ⁷⁾ |
| A. | <i>Hem</i> | <i>Hen</i> ⁷⁾ |
| O. | <i>Van hem</i> | <i>Van hun.</i> |

Siet Pontus de Heviter.

Eenvoudig. Veelvoudig.

| | | |
|--|-------------------------|------------------------------|
| | N. Hy. Ipse | Zy ofte Zylieden Ips. |
| | B. Zijns, Zijnes | Haerer |
| | G. Hem | Hun |
| | A. Hem | Hen |
| | O Van hem | Van hun, |

Enige Geleerde wille hier in de plaetse van

³ This thesis will only focus on the 3rd person plural pronoun in accusative case (*hen*).

Fig. 2 Dutch personal pronouns according to van Heule's grammar from 1625

| | Eenvoudig (<i>singular</i>) | | Veelvoudig (<i>plural</i>) | |
|--------------------------|--------------------------------|-----------------------------------|--------------------------------|-----------------------------------|
| | Mannelicken (<i>male</i>) | Vrouwelicken (<i>female</i>) | Mannelicken (<i>male</i>) | Vrouwelicken (<i>female</i>) |
| Noemer (<i>nom</i>) | hy | zy | zy(lieden) | zy(lieden) |
| Baerer (<i>gen</i>) | zijns | haer(e)s/heures | haerer/hunner | heurer |
| Gever (<i>dat</i>) | hem | haer/heur | hun | heur(l) |
| Aenklager (<i>acc</i>) | hem | haer/heur | hen | heur(l) |
| Ofnemer (<i>abl</i>) | van hem | van haer/heur | van hun | heur(l) |

Heule, Christiaan Van. *De Nederduytsche Grammatica Ofte Spraec-konst*. Ed. Willem Johannes Hubertus. Caron. Groningen: J.B. Wolters, 1953. Print

Since 1625, the Dutch language has gone through some major changes, such as the disappearance of endings on adjectives (Weerman 249-60). Those major changes also come forward when comparing van Heule's system of pronouns to the current Dutch pronominal system depicted below.

Fig. 3 3rd person pronouns in Modern Dutch

| | | Singular | | Plural | |
|-------------------|----------------|--------------|---------------|-------------|-------------|
| | | Male | Female | Male | Female |
| Subject | full | hij | zij | zij | zij |
| | reduced | ie/die | ze | ze | ze |
| Possessive | full | zijn/van hem | haar/van haar | hun/van hen | hun/van hen |
| | reduced | z'n/ze | 'r/d'r | 'r/d'r | 'r/ d'r |
| Ind.Object | full | hem/aan hem | haar/aan haar | hun/aan hen | hun/aan hen |
| | reduced | | | ze | ze |
| Object | full | hem | haar | hen/hun | hen/hun |
| | reduced | 'm | 'r/d'r | ze | ze |
| Ablative | | - | - | - | - |

Haeseryn, Walter. "Het Persoonlijk Voornaamwoord." *Algemene Nederlandse Spraakkunst*. 2nd ed. Groningen: M. Nijhoff, 1997. 242-290. Print.

Donaldson, B. C. *Dutch: A Comprehensive Grammar*. London: Routledge, 1997. 54 - 66. Print.

The loss of the ablative case, "ofnemer" by Heule, is the first obvious difference between the two pronominal systems. Other losses that have been suffered are the female plural inflections and the replacement of the four cases by function-based names such as Subject for

Nominative. However, besides these three discrepancies, the different pronouns in the Dutch pronominal system have stayed remarkable stable over the last 387 years, with only some minor changes in spelling⁴ and loss of the genitive marker -s.

The Dutch pronominal system seems not only to have lost some of its characteristics, but also to have gained one. Whereas Heule's system does not mention any reduced pronouns, the ANS mentions an unstressed form for almost every pronominal form. We, however, cannot assume that there were no reduced pronouns in the spoken language in 1625 and it is more likely that Heule probably just did not record them in his grammar. Nevertheless, the significant distinction between full objective pronoun *hen* and the reduced pronoun *ze*, found in the modern pronominal system, seems to be of recent realization. Haeseryn does point out that the non-subjectival, stressed pronoun *hen* can only be used to refer to people, whereas the reduced form *ze* can have the same syntactical functions as *hen* with the addition of reference to anything besides people, but it is difficult to pinpoint when this distinction made its entrance into the Dutch language (247-8). In 1967, Vooy's and Schönfeld mention a similar feature of Dutch very shortly in their grammatical description of the Dutch language saying that the "less emphasized" form *ze* is the "only possible form to indicate things" (87). From this description, however, one could deduce that their notion of the *hen/ze* distinction is slightly different from the modern division. The reduced pronoun *ze* seems to be restricted to things only, unlike now, and Vooy's and Schönfeld do not mention the restricted use of the pronoun *hen* at all.

To conclude, although the pronoun forms *ze* and *hen* have been around since (probably well before) 1625, the semantic distinction between these two 3rd person plural pronouns that exists in Modern Dutch seems to be the result of a recent change.

1.3 Acquisition of personal pronouns

1.3.1 Difficulties with the acquisition of pronouns

General problems recognized in first language acquisition, such as the "poverty of the stimulus" and the lack of "negative evidence" in the language input, also play a role in the acquisition of pronouns and make a smooth acquisitional process more difficult (Laurence 217, Wijnen 224). In addition, some aspects of personal pronouns are very complex and are expected to pose a problem for a young child trying to acquire its language.

⁴ spelling changes: *y* → *ij* and *ae* → *aa*

1.3.1.1 General problems

A well-known problem in first language acquisition is the lack of "negative evidence" in the input that children have to deal with (Wijnen 224). This insufficiency of the input also plays a role in the acquisition of the distribution of the pronouns *ze* and *hen* in Dutch. As explained in the introduction, the pronoun *ze* can be used in all contexts, both [+human] and [-human]. A child will thus hear this pronoun being used in both contexts. The pronoun *hen*, on the other hand, can only be used in a [+human] context and a child will consequently only hear the pronoun *hen* being used in that particular context. However, without negative evidence, stating that the pronoun *hen* is not grammatical in a [-human] context, a child runs into a "subset problem" and might over-generalize *hen* on the basis of deduction and extend the pronoun to the same contexts in which *ze* is used (Manzini 414). Subsequently, due to the absence of "concrete reason to think that this last is *not* [correct] (...) [the child] should continue in [its] erroneous belief that the string is grammatical" (Cowie 18). After all, a child is not able to draw any conclusions based on the fact that it has *not* heard something in a particular context, but only on what it *has* heard.

Linguists such as Snyder, however, propose the theory that children are "conservative" learners and that they wait for clear evidence in their input before they construct a grammatical rule (4). The learnability problem caused by the lack of negative evidence is thus circumvented by this learning strategy and prevents children from using *hen* in a context in which they have not heard it. When taking a look at how this theory might work in practice though, another problem arises. If children base the use of *hen* on their linguistic input they are unlikely to acquire the semantic distinction between *hen* and *ze* at all. Three corpora of the Dutch language, compiled by de Rooij, Uit den Boogaart en De Jong, all show that the pronoun *hen* is hardly or even never used in spoken language⁵. This "poverty of the stimulus" therefore seems to counteract a learning strategy based on input such as the conservative learning strategy suggested by Snyder (Laurence 217-8).

1.3.1.2 Context

Pronouns hardly ever come alone. As explained in section 1.2, a pronoun is used to substitute another noun and therein is linked to an antecedent, as in sentence (5).

⁵ Number of occurrences of *hen* in the three corpora of Dutch: de Rooij: 0 in 12.000 words, Uit den Boogaart: 3 in 120.000 words, de Jong: 0 in 120.000 words.

Principle A: proximal versus non-proximal

"This principle establishes a boundary between two areas in the positional structure with S and A on one side and O₁ and O₂ on the other"⁷

Principle B: speaker versus non-speaker

"This principle introduces a distinction that makes a further differentiation within (...) the first principle of contrast. Within the two basic reference points there is a preference for the speaker's own position (...) [which] has as its consequence that naming the speaker should be less complex than naming the addressee on the one hand and naming a connection from the speaker's position should be less complex than from the addressee's position, on the other"⁸

Principle C: singular versus non-singular

"This principle assumes that naming a single person is less complex than naming a conjunction of two people, especially if the conjunction is or can be expressed with a single word"

In their research, Deutsch and Pechmann found the following emergence of German pronouns:

Fig 4. Order of emergence of German pronouns in the speech of German first language learners

| | German pronoun | reference | person/number | English pronoun |
|---|------------------|---|---|-----------------|
| 1 | mir/dir | S/A | 1 st p. sg/2 nd p. sg | me/ you (sg) |
| 2 | uns ₃ | S + A + O ₁ + O ₂ | 1 st p. pl (incl.) | us (group) |
| 3 | uns ₁ | S + A | 1 st p. pl (prox.) | us (me + you) |
| 4 | uns ₂ | S + O | 1 st p pl (n-prox.) | us (me + him) |
| 5 | euch | A + O | 2 nd p. pl | you (pl) |
| 6 | ihr | O ₁ | 3 rd p. sg. M | him |
| 7 | ihm | O ₂ | 3 rd p. sg. F | her |
| 8 | ihnen | O ₁ + O ₂ | 3 rd p. pl | they |

Deutsch, Werner, and Thomas Pechmann. "Ihr, Dir, or Mir? On the Acquisition of Pronouns in German Children." *Cognition* 6 (1978): 164. Print

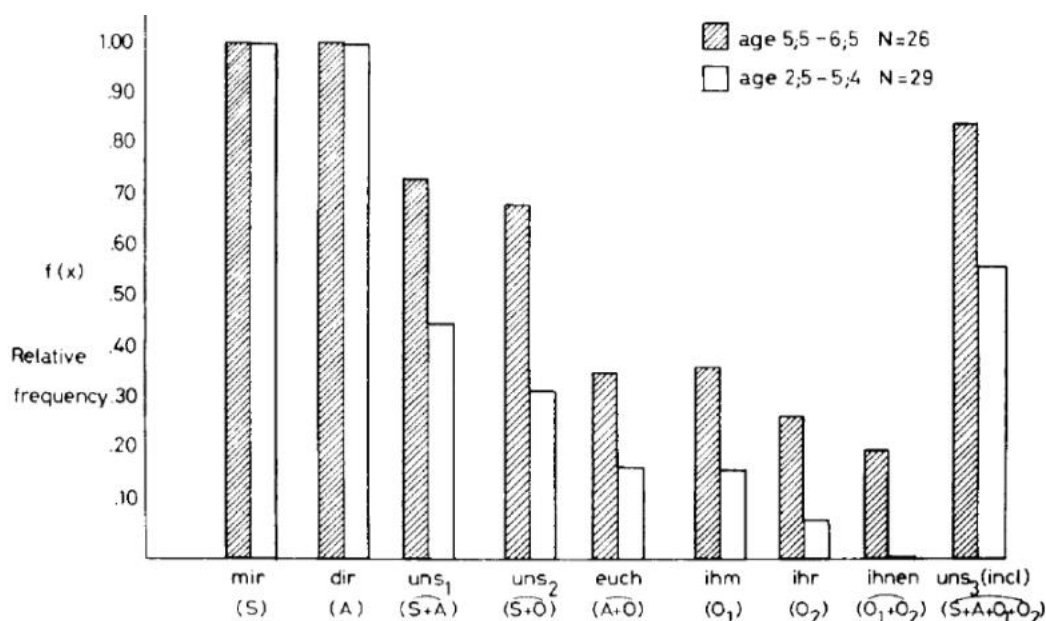
⁷ Deutsch and Pechmann used the abbreviations S and A for Speaker and Addressee, whereas O₁ and O₂ are used to indicate two listening entities, a male (1) and female (2) listener, in addition to the speaker and the addressee.

⁸ compare principle B to Charney's theory on "speech roles" discussed in paragraph 1.3.1.2 (509)

When taking a look at their results, we can see a clear relation between the emergence of pronouns and reference to the speaker. The first four pronouns that are acquired all contain a reference to the speaker, whereas the three last pronouns only contain a third person reference. In addition, the data show that proximity to the speaker, Principle B, is of importance to the complexity of a pronoun. This is reflected in the order in which the two different forms of *us* are acquired: first S + A, then S + O. Thirdly, although singularity seems to play a role in the acquisition of German pronouns, it is apparently secondary to Principle A and B, seeing that singular 3rd person pronouns are only acquired after the 2nd person plural pronoun *euch*, but before the plural 3rd person pronoun *ihnen*. When taking a look at figure 5, we can see that the youngest age-group (2;5 - 5;4) hardly ever use this final pronoun in a correct way and, although the performance improves for the following age group (5;5 - 6;5), the use of the pronoun *ihnen* remains problematic (164).

Although Deutsch's and Pechmann's experiment dealt with production and not with comprehension, the fact that the 3rd person plural pronouns are produced latest shows a clear difference in complexity and support their theory of principles A, B and C. In addition, since "there is an association between [a] child's capacity to produce an item and its availability for comprehension", we might assume that the ordering in which children start to produce the different pronouns is parallel or at least similar to their comprehension (Clark 43).

Fig. 5 Relative frequency of correct responses in both age groups



1.4 Summary

The paragraphs above have aimed at giving an overview of the Dutch pronominal system and the difficulties a first language learner might run into in its acquisition of pronouns. Section 1.2 gave a general view on the pronouns in Dutch, including a historical outline of the development of the 3rd person plural pronouns. The theoretical framework continued with a review of the various obstacles children have to overcome when acquiring pronouns such as the lack of negative evidence in the child input, poverty of the stimulus, speech roles and the relative complexity of 3rd person plural pronouns. All the researches and theories that were referred to in the sections above seem to support the idea that the acquisition of language is a very daunting task and that the acquisition of pronouns specifically forms a major hurdle in the child's transition from first language learner to native speaker.

2. Research Question and Hypothesis

Based on the linguistic articles described in the first chapter and the data that have been the result of previous research into the acquisition of personal pronouns, the subjects of this research, children aged 4 to 6, are *not* expected to be fully aware of the semantic distinction between the 3rd person plural pronouns *hen* and *ze*. They will, instead, probably overgeneralize the use of the pronoun *hen* to the same contexts and conditions as *ze* and use both pronouns interchangeably. Knowledge regarding the use of the pronoun *ze* is expected despite some errors in younger children (age 4) that are still in the process of acquiring all pronouns (Wells 261). Adults, having fully acquired their mother tongue, should not have any problems with either pronoun and with the semantic distinction between them.

3. Methodology

3.1 Introduction

The research of this thesis consisted of two executions of the HEN-experiment, one with children and one with adults. Both subject-groups were tested on their knowledge of the human-feature distinction between the pronouns *hen* and *ze*.

3.2 Subjects

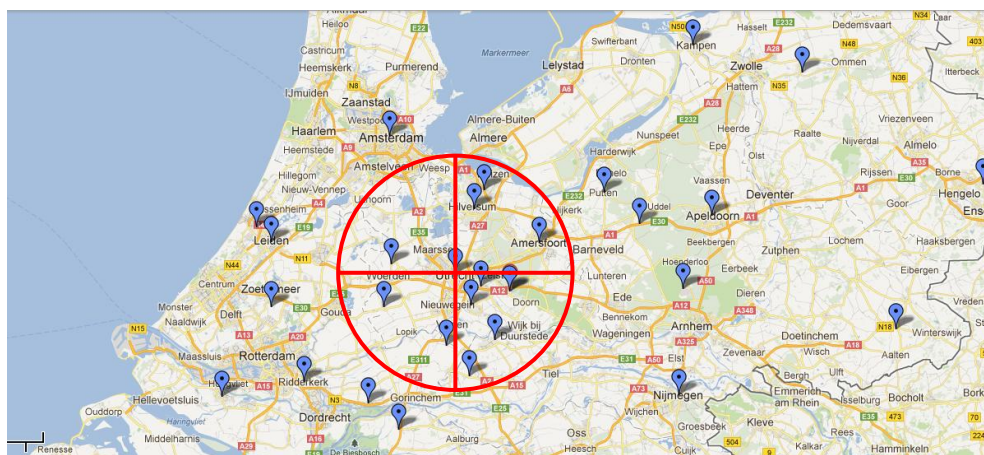
3.2.1 Children

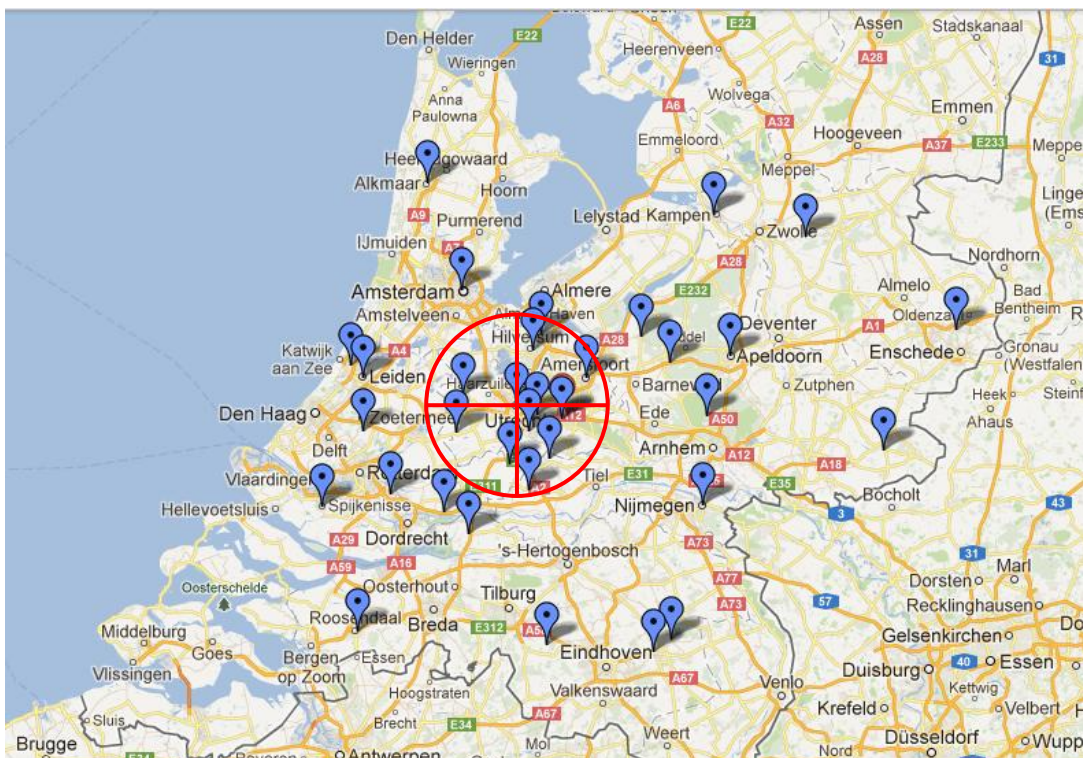
The group of young subjects consisted of pupils of De Marke, a primary school located in Amersfoort Vathorst. Some of these pupils, around 4 out of 50 subjects, were excluded from the experiment due to anxiety to take part in the experiment or failure to complete the introductory part of the experiment, leading to a total of 46 subjects with a mean age of 5;6 (ages ranging between 4;0 and 6;11). The boy-girl ratio was 60% - 40%.

3.2.2 Adults

The group of adult subjects was originally added to act as a control group and consisted of 20 subjects with a mean age of 46 (ranging between 26 and 83) with a sex division of 36% - 64% (man-women). In a later state of the research, the group of adult subjects was expanded to 66 subjects. The entire adult group consisted of employees of the Hogeschool Utrecht, mainly from the educational and IT department, and friends and family of the researchers. The 66 subjects had a mean age of 39 (ages ranging between 19;3 and 83), were fairly evenly distributed in sex (53% - 47%), consisted for 98,48% out of L1 speakers of Dutch and for 92% out of non-dialect speakers. Of the 66 adult subjects, 36 had been born and raised in or around Utrecht (see figure 6).

Fig. 6 geographical distribution of adult test subjects and determination of Utrecht-area





3.3 Design and procedure HEN-EXP

The subjects were tested on their knowledge of 3rd person plural object pronouns *ze* and *hen* and specifically on their knowledge of the [+/-human] and [+human] features of those pronouns. The experiment looked into three different aspects of the 3rd p. pl. pronouns:

- comprehension of the pronoun *ze*
- [+human] and [-human] preference for the pronoun *ze*
- [-human] restriction on the pronoun *hen*

These three aspects were linked to three test-items in the experiment:

Test-conditions

ZF *Ze False*

Testing the judgment of a **false statement** containing *ze* with an **ambiguous reference**.

Context: Main character *Suzanne* has three sisters and has hid three pieces of candy behind the couch.

Introductory question: Wat is er met de snoepjes of de zusjes gebeurd?
What happened to the candy or the sisters?

Test sentence: Ze heeft ze in de mand gelegd.
She put them in the basket.

The pronoun *ze* in the test sentence can refer to the [+human] sisters or the [-human] pieces of candy and is therefore *ambiguous*. For both possible references *ze* is false.

ZA *Ze Ambiguous*

Testing the judgment of an **ambiguous statement** containing *ze* with an **ambiguous reference**.

Context: Main character *Tom* has send his two friends into the tent and his two dogs into the house.

Introductory question: Wat is er met de honden of met de twee vrienden van Tom gebeurd?
What happened to the dogs or the friends of Tom?

Test sentence: Hij heeft ze het huis ingestuurd.
He send them into the house.

The pronoun *ze* in the test sentence can refer to the [+human] friends or the [-human] dogs and is therefore *ambiguous*. For the [+human] references *ze* is false, for the [-human] reference *ze* is true.

HF *Hen False*

Testing the judgment of a **false statement** containing *hen* with an **unambiguous reference**.

Context: Main character *Moeder* has placed her two sons in the car and her two grocery bags in her bike.

Introductory question: Wat is er met de boodschappen of de kinderen gebeurd?
What happened to the grocery bags or the children?

Test sentence: Ze heeft ze in de bakfiets gezet.
She put them in the bike.

The pronoun *hen* in the test sentence can only refer to the [+human] boys and is therefore *unambiguous*. The test sentence is *false* for this reference.

The three parts of which the experiment consisted each attended to one of these conditions.

In addition to the three test-conditions discussed above, the experiment consisted of several control-conditions, allowing the researchers to keep track of their subjects overall competence and focus. The following control conditions were built into the experiment (also see 3.3.7):

Control Conditions

T *Truth*

Testing the subject's competence regarding the judgment of a **true statement**

F *Falsity*

Testing the subject's competence regarding the judgment of a **false statement**

OF *or-question*

Testing the subject's competence regarding the judgment of an answer to an **or-question**⁹

Both the adults and children are expected to be able to judge a simple F or T statement. The control conditions should therefore not pose any problems. In addition, according to the hypothesis, the adults are expected to have full control of their native language and should be able to answer according to grammar on the ZF and HF test conditions. The children, on the other hand, should be able to correctly judge the ZF item, but are expected to encounter difficulties when having to judge the final HF condition.

The stories which made up the HEN-experiment were interchanged with stories of another experiment, the ÉÉN-experiment. This experiment acted as a diversion from the HEN-experiment and also provided some of the control-items, in addition to several filler-

⁹ example of an *or*-question: "What happened to the boys *or* the groceries?"

items. These filler-items were, however, not of importance to this particular study and will therefore not be discussed in this thesis.¹⁰

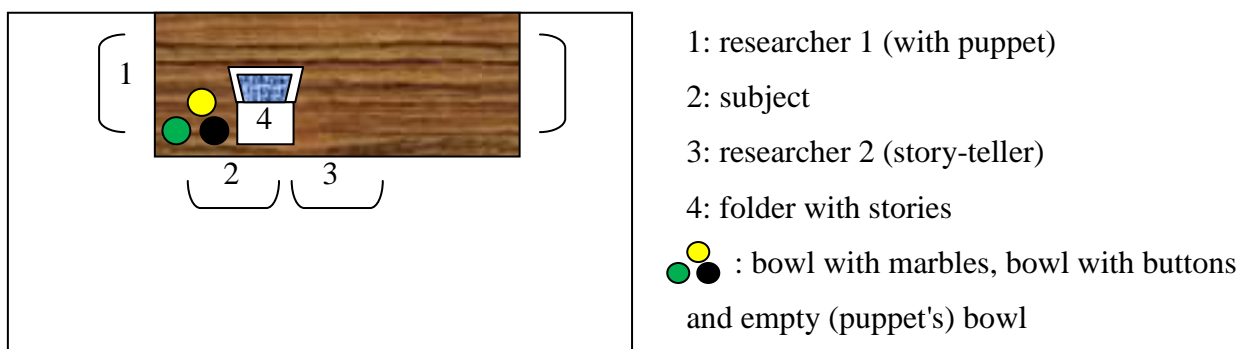
3.3.1 Puppet and Set up

3.3.1.1 Children

To gather data on the linguistic knowledge of young children regarding the [+/-human] distinction between *ze* and *hen* the research had to be set up in a way that it would correspond to the children's perception of the environment, would not cause them any anxiety and would keep their attention and focus throughout the entire experiment (Punch 324-325). As Punch points out, a child might not answer according to its competence for several reasons: "to avoid talking about a painful subject; to say what they think the researcher wants to hear; or through fear, shame or a desire to create favorable impressions" (325). To try and avoid a situation in which a child might feel the need to act differently than in a non-research setting, the research was set up using "interactive and game-based techniques", such as a puppet and short picture stories (Kellet 17). The puppet, *Drakie*, was first introduced in class. The researchers explained who *Drakie* was, that the puppet needed to learn to pay more attention and that they would like the children to help him with that. The researchers also introduced the method of research in class, with a very short picture story and TVJ-task (see 3.3.2 and 3.3.3 for additional info).

After this joint introduction the children would be tested individually. Inside the teacher's lounge, the location where the individual experiments were performed, the researchers had a table set up as follows:

Fig. 7 HEN-EXP set-up for children subjects



¹⁰ For a discussion of the ÉÉN experiment, see Huisman "De interpretatie van enkele kwantor-negatie zinnen door taalverwervende kinderen" (2012)

The subject was placed in between the two researchers, with the puppet-researcher on the left and the story-teller on the right. The puppet was placed in such a way that it could not see the pictures in the folder held by the story-teller. In front of the subject were 4 items: a folder that contained all the stories, a bowl with marbles, bowl with buttons and an empty bowl. The story-teller would hold the folder in such a way that only one, the relevant, picture was visible at a time. The adjacent page would show the script which was used by the story-teller to hold on to the correct structure of the research in each different run. The three bowls on the table were used for the TVJ-task (see 3.3.2). The subject was placed at the table in such a way that it faced the blank wall and had the least distraction possible.

Once the subject was seated, the story-teller would recapitulate what was already explained in class. After this brief introduction, the experiment would start off with a practice story (see 3.3.3) to let the child get used to the method of research. If the child needed a lot of coaching during the first practice story, the researchers would follow it up with a second practice-run. The objective was to get the child to answer without any coaching at all. If a child failed to answer the "true" and "false" control items correctly and without coaching during at least one of the practice stories, he or she was excluded from the rest of the research.

3.3.1.2 Adults

Since adults, unlike children, are used to being tested, there is no need to adapt the research in the same way as when performing the experiment with children. The presence of *Drakie* the puppet was, for instance, rendered unnecessary and omitted. In addition, the adults are expected to be able to perform a TVJ-task and judge the value a simple false of true statement. This made the addition of the practice stories, control-, and filler-items and judging aids, such as marbles and buttons, superfluous.

Each adult subject was asked to take a seat at a table, opposite the researcher, who held the folder containing the stories. Similar to the experiment with children, the adults were presented with only one relevant picture at a time. At the end of the story, the researcher would pose a question about its content, the same as in the child experiment, and would immediately present an accompanying answer to that particular question (the answer which would normally be given by the puppet). The adults were then asked to judge the value of the answer given by the researcher with either *true* or *false* and write their answer on an answer-sheet (see 8.3.7).

3.3.2 TVJ

3.3.2.1 Children

A very useful technique in child research is a "structured interview" which consists of "a series of predetermined closed questions" (Kellett 16). Especially when dealing with a large subject group, as was the case in this research, and the results of different groups have to be compared afterwards (Kellett 16). In line with these views on child research, the comprehension of the 3rd person plural pronouns *ze* and *hen* was tested with the use of three picture stories and several predetermined Truth-Value-Judgment (TVJ-)tasks.

During and at the end of each picture-story, the story-teller would ask the puppet to make a statement about the story that had just been told to check whether it was paying attention, the alleged objective of the experiment. The child's task was to judge the statement made by the puppet by either providing positive or negative feedback. To ensure an unambiguous answer from the test-subjects, the researcher introduced a bowl of marbles and a bowl of black buttons at the start of the experiment. Each time a subject judged the puppet's statement to be correct, he/she was asked to place a marble in the puppet's bowl. Each time it judged the statement to be incorrect, it was asked to place a black button in the puppet's bowl. This way, the children were unable to avoid giving a definite answer, which would lead to clearer, more absolute results. The researcher that controlled the puppet recorded the child judgments on an answer sheet (see 8.3.6).

3.3.1.2 Adults

The adults were also presented with a couple of TVJ-tasks. As explained earlier, adults do not need help when performing such a task, so there was no need to retain the use of marbles and buttons. The adults were simply presented with an answer sheet with room for three *true/false* judgments. At the end of each story, the story-teller would pose a question and immediately provide an accompanying answer, merging the script of the story-teller and the puppet into one. The adult subjects were then asked to judge the provided answer.

3.3.3 Practice story

3.3.3.1 Children

In order to get the children used to the method of research and "build rapport with the research subjects," the researchers implemented an introductory/practice story at the start of

the experiment (Punch 328). This way, the researchers could coach the different subjects in the performance of the TVJ-tasks and create a safe environment.

At the start of the practice story, the researcher in the role of the story-teller described the first picture in the folder and provided some minor context to the story. The following page shows the start of the practice story¹¹, which is about a girl, her dog and a swing. This practice story contained one item for each of the control conditions described in the introduction (T, F, OF). The items were arranged in such a way that their difficulty increased with each item, "false statements being more difficult to evaluate than true statements" (Nieuwland 1213). Coaching by the researchers was allowed and usually employed one or more of the following strategies:

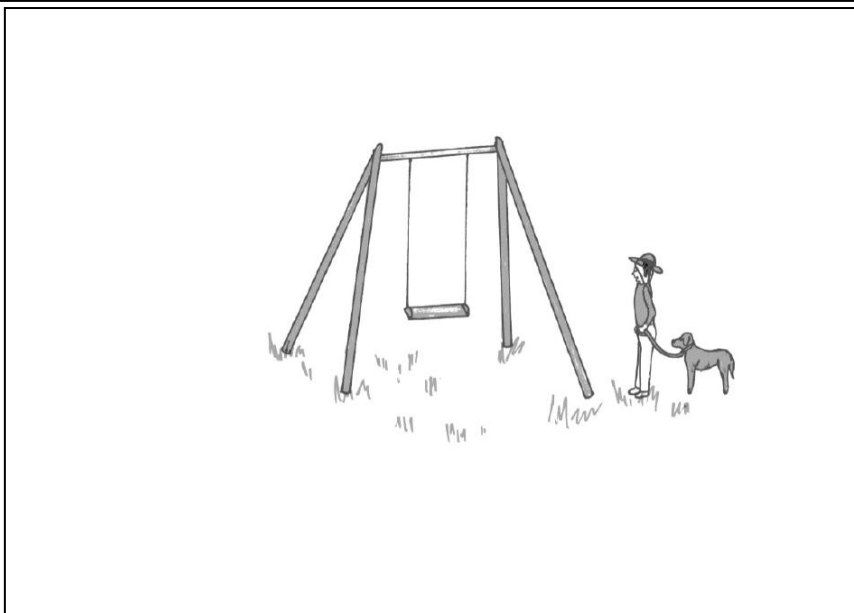
1. leafing through the previous pages and/or returning to the picture that is relevant to the question
2. pointing at relevant items in the picture
3. repetition of the puppet's statement
4. clarifying and dissecting the puppet's statement¹²

If a child grasped the method of research quickly and hardly needed any coaching during the practice story, the researchers continued with the first test story (see 3.3.4). However, if a child could not perform the TVJ-task independently and relied too much on the researcher's coaching, the first practice story was followed by a second story. This second practice story, again, contained all control items with the exception of a T control. For a subject to pass the second practice story, and be allowed to take part in the rest of the experiment, it had to act adult-like under all control conditions without any coaching from the researchers. If a subject failed to meet this requirement, the researchers would wrap up the experiment quickly and return the child to the classroom.

¹¹ the original pictures were in full color.

¹² "so if the puppet says he did NOT take the birds, and he DID take them, than the statement is"

Fig. 8 First picture of the HEN-EXP practice story



Researcher: Drakie, wij kijken nu naar een plaatje met een schommel. En er is ook een meisje. Het meisje heeft haar hond meegenomen naar de schommel. Ze heeft ook een hoed op. Ze gaat schommelen.

Drakie, we are looking at a picture with a swing-set. There is also a girl in the picture. She has taken her dog along to the swing-set. She is also wearing a hat. She is going to swing.

3.3.3.2 Adults

Because adults, unlike children, are already expected to be able to understand and answer the different control conditions, these conditions did not have to be implemented in the adult research. The two introductory stories were therefore replaced by a simple and short instruction on how the research would proceed.

3.3.4 First story

3.3.4.1 Children

The first story aimed to test the ZF condition, the children's and adults' ability to correctly judge a false statement using the reduced plural pronoun *ze*. The use of *ze* when a 3rd person plural pronoun is needed is always correct, since it places no restriction on its antecedent. This story was built into the experiment to see whether children would confuse the grammatical use of *ze* in a sentence like "ze heeft *ze* in de mand gelegd," when talking about three pieces

of candy, with the incorrectness of the sentence within the context of the story and, as a consequence, misjudge the sentence.

The story consisted of 6 pictures that told the story of Suzanne, who celebrates her birthday by playing a birthday game with her three sisters. The story contained two test-phases: one at the start of the story and one at the end. The first test-phase contained a T and an F/OF control and was implemented to make sure the child was paying attention to the story. Figure 9 shows an example of test phase 1. The second test-phase contained another T control condition and ended with the ZF item. The question used to introduce the ZF condition was an OF question (see 3.3.7) To make the experiment more fluent, the researchers added an extra picture after the test-item, to give the story a more natural ending.

According to the hypothesis the children are expected to perform well in this first part of the experiment. If they have passed the introductory part of the story, the subjects should have no problems with judging the two T control conditions and the F condition. Since the children are also expected to understand the use of *ze* and because the test item is false for both the [+human] and the [-human] reference, the children are not expected to have any problems with the ZF condition either.

3.3.4.2 Adults

The adult experiment contained the same story as the one used for the children's experiment. However, since there was no need for any control items, the first test-phase was deleted and the second test-phase consisted of only the ZF test-item. In addition, the final, superfluous, picture was taken out to shorten the experiment.

Since the *ze/hen* distinction was not of importance to this story, the test item being false for both [+human] and [-human] conditions, the adults should not regard the ZF item to be different than any other F item. They are therefore expected not to encounter any problems and respond correctly.

Fig. 9 First picture of the HEN-EXP: ZF condition story



Researcher: Dit is Suzanne. Suzanne is jarig en ze is een spel aan het spelen met haar drie zusjes. Drakie, kun je ons vertellen wat er met Suzanne aan de hand is?
This is Suzanne. It's Suzanne's birthday and she is playing a game with her three sisters. Drakie, can you tell us what is going on with Suzanne?

Puppet: Puppet T → Suzanne is jarig
It's Suzanne's birthday

<subject judges puppet's statement by placing either a marble or button in puppet's bowl>

Researcher: Heel goed! En wat kun je nog meer vertellen over Suzanne of haar zusjes?
Well done! And what more can you tell us about Suzanne or her sisters?

Puppet: Puppet F (...OF...) → Suzanne heeft vier zusjes
Suzanne has four sisters

<subject judges puppet's statement by placing either a marble or button in puppet's bowl>

Researcher: Jammer Drakie, dat is niet goed.
Too bad Drakie, that is not correct

3.3.5 Second story

3.3.5.1 Children

The second story was implemented to find out more about children's preference towards the reference of the plural pronoun *ze*, the ZA condition. This short story consisted of only two pictures and contained one T item and one F item in addition to the ZA test-item. As with the first story, the conditions were divided over two test-phases, with the control-items being presented in the first phase and the test-item at the end of the story. The context was constructed in such a way that ZA test sentence (6) was ambiguous and could be interpreted in two ways. If a subject judged the statement to be false, he had perceived the pronoun *ze* as an anaphor to the [+human] entities in the story. However, if he judged the statement to be true, he had identified an anaphoric relationship between the pronoun *ze* and the [-human] entities.

(6) Tom heeft *ze* het huis ingestuurd

(6) *Tom send them into the house*

a. false → *ze* refers to [+human]

b. true → *ze* refers to [-human]

Therefore, depending on the subject's answer, their preference for the reference of the pronoun *ze* could be deducted.

Since there is no evidence yet that children have a specific preference for either reference of meaning for *ze*, the expected outcome is close to a 50/50 division between truth and false judgments. However, there are two factors that could influence this outcome. Children have been known to show a "tendency to answer 'yes' when they are posed yes-no questions by adults" (Moriguchi 431). This "yes-bias" predicts that some children, perhaps confused by the ambiguity of the statement, will prefer a truth judgment over a false judgment. This should be reflected in the results by a higher percentage of truth judgments. However, a second factor might influence the children in the opposite direction, counteracting the yes-bias effect. As the picture below shows, the pragmatics of the experiment might have an effect on the subjects' judgments. The test-sentence (6) talks about Tom sending the dogs *into* the house. Although the truth of this statement is proved during the story, the picture does not show the dogs actually *inside* the house. The boys, on the other hand, are inside of something, only it is not a house but a tent. This pragmatic discrepancy between the story and

the picture might cause children to perceive the ZA item as another ZF item, both [+/-human] entities are *not* in the house, and influence them towards a F judgment.

If the pragmatic factor is of a stronger influence than the yes-bias, the expected results will show a slight preference for the F judgment. The two factors could also cancel each other out, again leading to a 50/50 division.

Fig. 10 Second picture of the HEN-EXP: ZA condition story



3.3.5.1 Adults

The adult experiment was, again, very similar to the child experiment expect for the deletion of the control condition.

The results will again show a preference for either the T or F judgment, but the factors that are of influence in the child experiment are also expected to be of some importance here. Although usually attributed to children, Moriguchi points out that the yes-bias is also found in adults, may it be for other reasons than in children (439). In addition, adults are also expected to be influenced by the visual information of the picture. The results will show whether adults show a strong preference for either the [+human] or [-human] reference and how strongly they are influenced by yes-bias and pragmatics.

3.3.6 Third story

3.3.6.1 Children

The third story was the most crucial and contained the main test-sentence of the entire experiment: the HF test condition. Like in the second story, the subject's answer would directly show in which way he or she regarded the tested pronoun. This time, however, the test-sentence (7) contained the full 3rd person plural pronoun *hen* instead of *ze*.

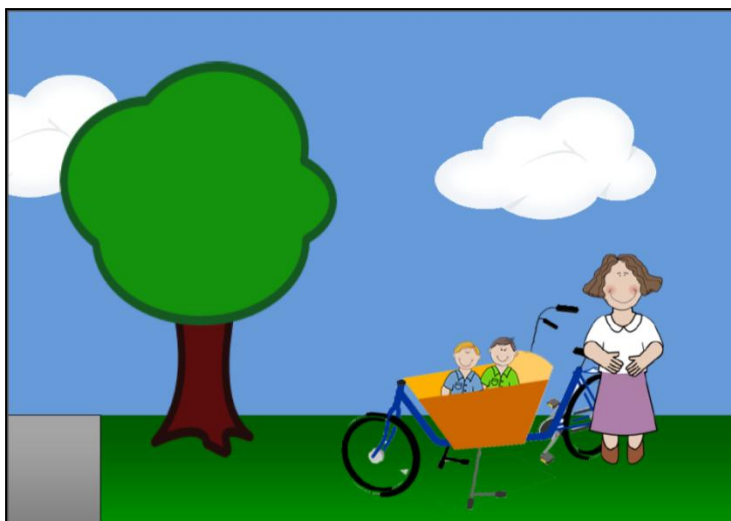
(7) Moeder heeft hen in de auto gezet

- | | | |
|----------|---------------------------------|-----------------------|
| a. true | → <i>hen</i> refers to [-human] | → unexpected behavior |
| b. false | → <i>hen</i> refers to [+human] | → expected behavior |

This last story was presented to the different child subjects in two versions¹³. After having performed the first version of the experiment on several children, the researchers concluded that a correct answer could come forth not just out of competence, but also by the pragmatics of the story and the pictures, i.e. the subjects were helped in their answer by the way the story was set up and the visual information they were presented with during the TVJ-task. The picture on the following page shows the final picture of the third story, version 1. At the end of the story, when test-sentence (7) is produced, the subject is looking at a picture in which the boys are sitting in the freight bike and not in the car. If the subject is not really paying attention to the puppet's statement, not hearing the word *hen*, but simply presumes the sentence to be about the entities in the picture, it will come to the expected answer (*false*), but not based on its linguistic knowledge. To be able to draw conclusions on children's linguistic competence, the researchers devised a second version of the story in which the pragmatics conflicted with the correct (or expected) answer, i.e. if the subject presumed the statement to be about the entities in the picture, this would lead it to an incorrect *truth* judgment (see fig. 12). Consequently, if a child responded correctly, it had ignored the picture and relied solely on its linguistic knowledge.

¹³ 10 subjects were presented with version 1, the other 36 with version 2.

Fig. 11 Final picture of the HEN-EXP: HF condition story version 1



Researcher: Zelf gaat mama met de bakfiets naar huis. Ze zet haar twee zoons voorin de bak van de bakfiets en ze fietst naar huis. Ok, Drakie, kun je vertellen wat er met de boodschappen of de kinderen is gebeurd?

Mother takes the freight bicycle back home. she puts her two sons in the front of the freight bike and rides home. Now, Drakie, can you tell us what happened to the groceries or the children?

Drakie: Ze heeft hen in de auto gezet.

She put them [+human] in the car

Fig. 12 Final picture of the HEN-EXP: HF condition story version 2



Researcher: Zelf gaat mama met de bakfiets naar huis. Ze zet de twee boodschappentassen voorin de bak van de bakfiets en ze fietst naar huis. Ok, Drakie, kun je vertellen wat er met de boodschappen of de kinderen is gebeurd?

Drakie: Ze heeft hen in de bakfiets gezet.

She put them [+human] in the freight bicycle

3.3.6.1 Adults

The adult subjects were only presented with the second version of the final story. In addition, as with the other two stories, the control condition was deleted. In accordance with the hypothesis, adults are expected to know the *ze/hen* distinction and should therefore have no problems with this final test item. The expected answer is therefore *false*.

3.3.7 T/F, filler and OF items

3.3.7.1 T/F and filler items

The complete experiment was actually an execution of two separate researches in one, the HEN-EXP described here and the ÉÉN-EXP. The two researches were very similar in design, TVJ task with picture-stories, and were therefore easy to combine. The experiment was set up in such a way that the test-items of one of the experiment acted as filler-items for the other and vice versa. Some of the control-items also coincided. Both stories included several simple false/true-statements that were implemented to see if each subject understood the (TVJ)task it was asked to perform and was paying attention to the experiment. This resulted in a total of 4 F control items for falsity and 6 T control items for truth, spread throughout the experiment.

3.3.7.2 OF questions

When taking another look at test sentence (6), repeated below, one can see that, depending on the context of the story, the sentence can be ambiguous. However, in the design of this experiment each statement is introduced by a question posed by one of the researchers. If this question was formed like in sentences (8) a. or b., this ambiguity would be dissolved immediately. To preserve the possible ambiguity of the test-sentence, the preceding question would also have to be two-fold, for instance, as question (9).

(6) Tom heeft ze het huis ingestuurd

(6) *Tom send them into the house*

(8) a. Wat kun je vertellen over de vrienden van Tom?

a. *What can you tell me about Tom's friends?*

b. Wat kun je vertellen over de honden van Tom?

b. *What can you tell me about Tom's dogs?*

(9) Wat kun je vertellen over de vrienden OF de honden van Tom?

(9) *What can you tell me about Tom's friends OR his dogs?*

By implementing these OF-sentences in the experiment, the intended ambiguity was maintained and, again, would force the subjects to base their answer solely on their linguistic knowledge. To train and check the children in their understanding of OF-sentences like (9), these sentences were also implemented in the practice story. Some of the other T and F control conditions were preceded by an OF question, such as the F3 control in the first story of this experiment.

Researcher: "Wat kun je vertellen over Suzanne OF haar zusjes?"
What can you tell me about Suzanne OR her sisters?

Puppet F3: "Suzanne heeft 4 zusjes"
Suzanne has 4 sisters

4. Results

The following paragraphs will give a summary of the data that was gathered by means of the HEN-experiment.

4.1 Control Conditions

Except for some individual cases, all children have shown to possess the knowledge and competence to reject a false statement and accept a true statement, as was expected. The average score for the false statements was 0.99 (with 0 being incorrect and 1 being correct) and for the true statements 0.95. The Control Conditions T and F were therefore passed by all children. The two tables below show the absolute numbers of correct responses for each F and T item. Some of the subjects were excluded for the second experiment that this research consisted of. The control items F1, F2, T1 and T2 therefore have a lower number of responses.

The results show the subjects responded slightly better when presented with a false statement than with a true statement, but only marginally.

Fig. 13 Number and percentage of correct responses for the F control conditions

| N ^o | Control Sentence | N | N Correct | % |
|----------------|--|----|-----------|-------|
| F1 | Het meisje heeft de ballen tegen het dak gegooid | 43 | 42 | 97,67 |
| F2 | Hij heeft de papiertjes in de prullenbak gedaan | 43 | 43 | 100 |
| F3 | Suzanne heeft 4 zusjes | 46 | 45 | 97,83 |
| F4 | De honden zitten in de tent | 46 | 46 | 100 |
| Average | | | | 98,99 |

Fig. 14 Number and percentage of correct responses for the T control conditions

| N ^o | Control Sentence | N | N Correct | % |
|----------------|------------------------------------|----|-----------|-------|
| T1 | De theedoeken zaten in een mandje | 43 | 38 | 88,37 |
| T2 | De jongen had een emmer meegenomen | 43 | 42 | 97,67 |
| T3 | Suzanne is jarig | 46 | 45 | 97,83 |
| T4 | Twee zuurtjes en een lollie | 46 | 44 | 95,65 |
| T5 | Tom heeft 2 vrienden | 46 | 44 | 95,65 |
| T6 | De vrachtwagen is rood | 46 | 43 | 93,48 |
| Average | | | | 94,78 |

The table below shows an overview of the data for the control conditions.

Fig. 15 Overview of the score for the F and T control conditions

| N | Mean age | Age range | F | | T | |
|----|----------|------------|------|----------|------|----------|
| | | | Mean | Range | Mean | Range |
| 46 | 5;6 | 4;0 - 6;11 | 0.99 | 0.75 - 1 | 0.95 | 0.67 - 1 |

The items F3, T5 and T6, in addition to being F and T control, also acted as OF control items. Although T6 received a somewhat lower score than average, it is not the lowest and seems to be more an effect of some individual difficulties than of a general problem of children with OF questions.

The lower success-rate for T1 might be explained by the statement that was made by the puppet. Although the researcher changed the statement into "De theedoeken zaten in een mandje" after a few runs, the original statement was "Het meisje heeft theedoeken meegenomen in een wasmand." Both statements were as true in reference to the story, but the latter might have been confusing in combination with the final picture of the story (see below), which the children were looking at when they were presented with this T item. This confusion between the statement being true, because the girl had brought the towels in a basket at the start of the story, and the ending of the story, the girl leaving without the towels, can probably account for the 88,37% score for the T1 item.

Fig. 16 Final picture of the ÉÉN-EXP filler story



4.2 Child Test Conditions

4.2.1 ZF

As explained in the design and procedure section, the children that passed the control conditions were allowed to take part in the entire research because they met the basic requirement for the experiment: being able to correctly judge a true and a false statement. As the paragraph above showed, all the 46 child subjects passed this test. The subjects also proved to be able to correctly judge a statement that was made following a OF-question. These findings support the expectation that the subjects should also be able to respond adult-like to the first test condition (ZF).

The table below shows the data for the ZF test condition.

Fig. 17 Number and percentage of correct responses for the ZF test conditions (child subjects)

| N | Mean age | Age range | N correct | % correct |
|----------|-----------------|------------------|------------------|------------------|
| 46 | 5;6 | 4;0 - 6;11 | 42 | 91,30 % |

Of the 46 subjects, as many as 42 subjects correctly judged the statement "Ze heeft ze in de mand gedaan" to be false. This proves that the children indeed have acquired some basic knowledge of the 3rd person pronoun *ze*. Although this test condition does not provide any information on the subjects' knowledge of the [+ human]/ [-human] distinction, it shows that they have understood the OF question and have tested the statement against at least one of the possible references (the candy and/or the sisters).

4.2.2 ZA

The second test condition, ZA, did not really test the subjects knowledge or competence of the *ze/hen* distinction, but was implemented to see if the children showed a clear preference for the reference of *ze* to be either [+ human] or [-human]. As explained in the design and procedure section (3.3.5) before, the test sentence, repeated as sentence (6), was ambiguous and the subject's answer would automatically reveal its reference of choice. In that section, the possible influences on the subject's answers, the "yes-bias" and the pragmatics of the picture story, were also touched upon.

(6) Tom heeft ze het huis ingestuurd

(6) *Tom send them into the house*

a. TVJ: false → *ze* refers to [+human]

b. TVJ: true → *ze* refers to [-human]

The table below again shows the results for this test item.

Fig. 18 Number and percentage of T and F judgments for the ZA test conditions (child subjects)

| N | Mean age | Age range | T | | F | |
|----|----------|------------|----|-------|----|-------|
| | | | N | % | N | % |
| 46 | 5;6 | 4;0 - 6;11 | 31 | 67,39 | 14 | 32,61 |

As the results show, the children seem to have a slight preference, 67,39%, for a T judgment and apparently let *ze* refer to the [-human] dogs in the story more often. It is unfortunately difficult to say what causes this slight preference. It could be that children prefer the pronouns *ze* and *hen* to be more in a complementary distribution than to let them both be used in a [+human] context and therefore prefer *ze* to refer to a [-human] context. However, it could also be possible that the subjects do not have a preference for the reference of *ze*. The higher number of T-responses could, for instance, also be accounted for by the aforementioned yes-bias.

4.2.3 HF

The final test condition, HF, was the main condition of this experiment. The subjects were not expected to be able to make correct judgments based solely on the semantic distinction between *ze* and *hen* and therefore expected to respond incorrectly to the test sentence "*ze* heeft *hen* in de bakfiets gezet," letting *hen* refer to the [-human] grocery bags and judging the statement to be true.

When taking a look at the data, however, it presents a completely different picture:

Fig. 19 Number and percentage of correct responses for the HF test conditions (child subjects)

| N | Mean age | Age range | N correct | % correct |
|----|----------|------------|-----------|-----------|
| 46 | 5;6 | 4;0 - 6;11 | 39 | 84,78 |

Of the 46 children that were allowed to take part in the experiment, 39 children responded correctly¹⁴ to the HF test sentence (10). The HF condition was build up in such a way that rejection could only be based on the subject's restricted reference of *hen* to the [+human] boys.

(10) Moeder heeft hen in de bakfiets gezet

a. *hen* refers to [-human] → true

b. *hen* refers to [+human] → false

The table below shows the data of the 6 child subjects that failed to respond correctly to the HF test condition (the data of the entire subject group in brackets).

Fig. 20 Overview of results of the *failed* child subjects

| N | Mean age | Age range | Controls | | ZF correct | | ZA | |
|-----------|--------------|---------------------------|----------------|----------------|------------|-----------------|---------------|---------------|
| | | | F | T | N | % | % T | % F |
| 6 (46) | 5;3 (5;6) | 4;0 - 6;0 (4;0 - 6;11) | 0.96 (0.99) | 1.00 (0.95) | 5 (42) | 83,33 (91,3) | 50 (67,39) | 50 (32,61) |

When looking at the data of the *fail* subjects, it becomes clear that there is no relation to age. These 6 subjects also passed the F and T control item which means their failure in the HF test item is also not accounted for by a lack of general knowledge. The data for the ZF and ZA test conditions seem to differ slightly from the data of the entire subject group, but the number of *fail* subjects is too small to allow any definite and strong conclusions to be made about this discrepancy.

4.3 Adult Test Conditions

At the start of the experiment, the adult subject group consisted of 20 subjects. This group was selected in order to be able to compare the child data with adult data. After having run the experiment with these 20 subjects, it was decided that additional data was needed. The adult subject group was therefore expanded to 66 subjects. The data that are summarized below are taken from the results of all 66 subjects.

¹⁴ A correct response entails the rejection of the test sentence

4.3.1 ZF

As was already explained in paragraph 3.3.3.2, adults are expected to be able to judge various true and a false statements. The adult test subjects were therefore not presented with and tested on the T and F control conditions. Consequently, there are no control data available for the adult subjects. Assuming, however, that adults are able to judge such a T or F statement, are not distracted or thrown off by an OF-question and know the syntactic and semantic features of the pronoun *ze*, the ZF test condition functions as a F control condition for the adult subject group.

The table below shows the adult data for the ZF condition:

Fig. 21 Number and percentage of correct responses for the ZF test conditions (adult subjects)

| N | Mean age | Age range | N correct | % correct |
|------------------|-----------------|------------------|------------------|------------------|
| 65 ¹⁵ | 39;1 | 19;3 - 83 | 64 | 98,46 |

As the data clearly show, and as was expected, the ZF condition did not cause any problems for the adult subjects. Except for one subject, who later indicated not to be paying attention at the start of the experiment, all adults correctly rejected the test sentence . These results show that adults are indeed able to correctly judge an OF-question and have a first language speaker knowledge of the pronoun *ze*.

4.3.2 ZA

As with the children, the ZA condition was not implemented in the adult experiment to gather data on knowledge, but instead aimed at uncovering a possible preference for the reference of the pronoun *ze* to either [-human] or [+human].

Fig. 22 Number and percentage of T and F judgments for the ZA test conditions (adult subjects)

| N | Mean age | Age range | T | | F | |
|----------|-----------------|------------------|----------|----------|----------|----------|
| | | | N | % | N | % |
| 66 | 39;1 | 19;3 - 83 | 43 | 65,15 | 23 | 34,85 |

¹⁵ One of the adult subjects was not tested on the ZF test condition

Like the children, the adults showed a slight preference for a T judgment of the test sentence, which means they preferred *ze* to have a [-human] reference. Although influences such as yes-bias and pragmatics are not expected to be as strong in adults as in they are in children, they are definitely still at play and may lead adults away from answering according to their linguistic knowledge . The fact that the ZA item is ambiguous and that there is thus no right or wrong answer might have confused adults and strengthened their yes-bias. It is therefore, unfortunately, not possible to make a absolute conclusion based on these date. However, the results are still interesting and seem to suggest a slightly more complementary distribution of the pronouns *ze* and *hen* than a purely grammatical point of view predicts.

4.3.3 HF

Since adults have long since acquired their first language, they are expected to master it fully. The adult subjects that took part in this experiment were therefore also expected to know the semantic *hen/ze* distinction and be able to respond correctly to the HF test condition. However, like with the child experiment, the results are somewhat different than expected:

Fig. 23 Number and percentage of correct responses for the HF test conditions (adult subjects)

| N | Mean age | Age range | N correct | % correct |
|--------------------------|---------------|---------------------------|------------|---------------|
| 66 (46) ¹⁶ | 39;1 (5;6) | 19;3 - 83 (4;0 - 6;11) | 33 (40) | 50 (86,96) |

The data in the table above show that as many as 33 adults incorrectly judged the HF statement to be true, resulting in a perfect 50/50 division between correct and incorrect answers. Figure 24 shows a summary of the data that belong to the groups of adults that passed and failed the HF condition. The final two columns show the percentage of adults that where brought up in or around Utrecht and the percentage of dialect-speakers.

Fig. 24 Overview of results of the *failed* adult subjects

| | N | Mean age | Age range | ZF correct | ZA | | RoB ¹⁷ Utrecht | Dialect |
|------|----|----------|-----------|------------------|------|------|---------------------------|---------|
| | | | | % | %T | %F | % | % |
| FAIL | 33 | 34;9 | 19;3 - 74 | 100 | 66,7 | 33,3 | 48,48 | 9,09 |
| PASS | 33 | 43;6 | 21;6 - 83 | 97 ¹⁸ | 63,6 | 36,4 | 60,61 | 6,06 |

¹⁶ the child data are added in between brackets for ease of comparison

¹⁷ Region of Birth

¹⁸ see 15

As the results show, there are no major differences between the group of adults that failed the HF condition and the group that passed. The mean and range of age are very similar for both groups. So are the results for the ZF and ZA test conditions. There seems to be a slight difference in the groups with regard to region of upbringing, but the absolute difference for RoB is only 4 subjects¹⁹.

4.3.4 HF Utrecht adults

The group of children that were studied all lived in Amersfoort, close to Utrecht. To be able to make a more evenly comparison, a group of 36 adult subjects were selected on the basis of their region of birth and upbringing: Utrecht. This way regional linguistic variables were eliminated. The table on the following page shows the data for the adult subjects from (around) Utrecht, together with the non-Utrecht and the child data.

When comparing the adult data from Utrecht to the data of the outer-Utrecht adult group, the former seem to have performed a little better in the HF condition. In addition, there is a contrast in ZA scores, with outer-Utrecht adults showing a clear preference for a T-judgment, or [-human] reference, unlike the Utrecht group that almost showed a 50/50 division in preference. Although the improved results of the Utrecht group for the HF condition cause a decrease in the discrepancy between the adult and child results for this test item, a difference of 31,4% is still significant enough to be noteworthy.

Fig. 25 Overview of data of the three subject groups: adults from (around) Utrecht, adults from outside the Utrecht area and children.

| | | Adults: Utrecht | Adults: non-Utrecht | Children |
|------------------|--------------------|------------------------|----------------------------|-----------------|
| N | | 36 | 30 | 46 |
| Mean Age | | 36;1 | 42;9 | 5;6 |
| Age Range | | 21;6 - 73 | 19;3 - 83 | 4;0 - 6;0 |
| Sex | % male - female | 61 - 39 | 43 - 57 | 59 - 41 |
| ZF | % correct | 97,22 | 100 | 91,30 |
| ZA | % T | 52,78 | 80 | 67,39 |
| | % F | 47,22 | 20 | 32,61 |
| HF | % correct | 55,56 | 43,33 | 86,96 |

¹⁹ N fail RoB Utrecht = 16, N pass RoB Utrecht = 20

4.3.5 Sex

This final summary of data shows the results for the Utrecht group divided by sex.

Fig. 26 Overview of data of the Utrecht adult subject group divided by sex

| | | MEN | WOMEN |
|------------------|-----------|-------------|--------------------|
| N | | 22 | 14 |
| Mean Age | | 33;4 | 40;4 ²⁰ |
| Age Range | | 22;5 - 55;4 | 21;6 - 73 |
| ZF | % correct | 95,45 | 100 |
| ZA | % T | 54,44 | 50 |
| | % F | 45,45 | 50 |
| HF | % correct | 45,45 | 71,43 |

Both Utrecht sub-groups are fairly evenly distributed for age, ZF results and ZA results. The results for the final test item, HF, are, however, quite far apart with a difference of 25,98%. This suggests that women from around Utrecht are far more sensitive to the *hen/ze* distinction than men from that same area.

5. Discussion

5.1 Interpretation of Results

The results summarized in chapter 3.4 clearly show that the child subjects passed the T and F control items for both the regular conditions as well as the items placed in an OF-question condition, as was expected. In addition, both the children and the adults correctly judged the ZF conditions and therein showed to possess knowledge of the use of the pronoun *ze* and emphasized their ability to correctly judge a false statement. For the ambiguous ZA items, both children and adults displayed a slight preference for a T judgment. This seems to indicate that all subjects had a preferred reference for *ze* to [-human] objects in the context. However, as stated before, external factors such as yes-bias and pragmatics need to be taken along in the equation. It is therefore not yet possible to make a definite statement about a *ze* reference partiality.

²⁰ The relatively high mean age for the women sub-group is mainly caused by one 73 year-old subject. When taking this subject out of the equation, the mean age already drops to 37;10

The results for the HF item are very surprising. Beforehand, the prediction was that adults, as fully developed native speakers of Dutch, would be aware of the semantic distinction between *ze* and *hen*. Children, on the other hand, were *not* expected to have acquired this distinction due to complexity of language acquisition in general and the acquisition of (3rd person plural) pronouns in particular. This final prediction was made based on previous research into language acquisition and pronominal systems. The picture presented by the results of this research, however, show a completely different, or even reversed, image. As discussed in paragraph 3.4.2.3, with an overwhelming 84,78% correct HF judgments, the child subjects showed a clear understanding of the [+human] restrictions of *hen*. With this finding, the original hypothesis of this thesis is invalidated. The remaining 15,22% of incorrect responses can easily be explained by the complexity of the pronominal system which was displayed by the theoretical framework and the young age of the subjects (chapter 1). The prediction that the *ze/hen* distinction was basic knowledge for adults was also invalidated by the results found through this experiment. As the data in 3.4.3.4 show, only 55%²¹ of the adult subjects gave a correct F judgment in response to the HF item. This 55%-45% division between T and F judgments seem to suggest that the *hen* pronoun is as ambiguous to adults as the *ze* pronoun with regard to its reference.

5.2 New Hypothesis

Based on the findings discussed above I would like to propose a renewed hypothesis:

The pronominal system of Dutch is currently subject to a linguistic change and is moving away from a system in which the distinction between various pronouns is based on syntactic features, such as case and gender, and moving towards a system which makes this distinction based on semantic features, such as [+/- human].

This hypothesis is in line with recent research conducted by Audring and by Beltman, who both found that "mono-lingual children choose the pronoun based on semantic characteristics of the noun; namely the features [+/- countable] and [+/- animate]" (Beltman 39). In addition, the hypothesis of language change is also supported by the finding discussed in 3.4.3.5. This

²¹ This percentage reflects the results of the Utrecht sub-group of adult subjects and was chosen to represent the entire adult subject group, because the characteristics of that sub-group correspond better to the characteristics of the child subjects and consequently contribute to a improved comparison. The success-rate of all adult subjects was 50% .

paragraph showed that women from (around Utrecht) seem to be far more sensitive to the [+human] restriction of *hen* than men (71,43% - 45,45%). As Labov showed in his 1966 study on raising in New York City, "women have been found to be in advance of men in most of the linguistic changes in progress studied by quantitative means" (Labov 280). If there is thus indeed a language change in progress, this change is very likely to show up in women first. The fact that this sensitivity to the [+human] restriction of *hen* shows up both in adult women subjects and child subjects seem to be additional proof of an ongoing linguistic change.

Another interesting finding that resulted from this study is the clear preference for [-human] reference of *ze* in outer-Utrecht adult subjects. 80% of adult subjects that were *not* from the Utrecht area favored a T judgment in the ZA condition. A possible explanation for this finding would be that the pronouns *ze* and *hen* are moving towards a more complementary distribution based on semantics, with *hen* referring only to [+human] and *ze* only to [-human]. When pairing the two findings of this research, increased sensitivity to *hen* restrictions and increased restriction on the use of *ze*, we might suspect a possible relation of causality; because more people are aware of the [+human] restriction of *hen*, they start to use only the pronoun *hen* in these contexts. Consequently, the pronoun *ze* is only used in [-human] contexts and over time comes restricted to only these contexts. Unfortunately, this hypothesis is not reflected in the data. Although evidence has been found that adults from (around) Utrecht are more sensitive to the *hen* restriction *and* evidence has been found that adults not from Utrecht have a [-human] preference for *ze*, there is no evidence for a possible link between these two findings. If both findings were a consequence of the same process, such as the rise of a complimentary distribution in 3rd person plural pronouns, we would expect to see an increased preference for [-human] reference of the pronoun *ze* in the same adults that developed a heightened sensitivity for the *hen* restriction. Evidence for such a connection has, unfortunately, not been found.

5.2 Follow-up, suggested improvements and additions

Based on the findings of this research, a new hypothesis has been proposed. In order to test this hypothesis and to gather more data on the knowledge of the *ze/hen* distinction among speakers and LA1 learners of Dutch it is necessary to perform a follow-up experiment. The second experiment can be similar to the current research in design and set-up. However, to gain more detailed and more tangible results, I suggest a few improvements to be implemented

The TVJ-task in the child experiment was conducted by means of marbles and buttons (positive and negative feedback). Although this research method worked really well and ensured absolute and clear data, it also caused the child subjects to be less vocal during the experiment and in their judgment. It was therefore more difficult to tell *how* a child had arrived at a certain answer and it decreased the linguistic feedback. Since children were no longer required to speak, they also stopped asking questions or explaining their answers. The TVJ-taks in a possible follow-up experiment should therefore preferably contain both the objects for absolute positive and negative feedback *and* require vocalization.

In section 3.3.1.2 the set-up for the adult experiment was discussed. Herein it was claimed that "adults do not develop anxiety when faced with an experiment" and that there was no need for an adaptation as was the case for the child experiment.²² However, during the execution of the adult research, most subjects showed clear signs of light anxiety, wondering whether they had *passed* right at the end of the experiment and wanting to know whether they had performed better or worse than a 4 year-old. This anxiety might thus have had an influence on their answers after all. In addition, the simplicity of the experiment, short children's stories, caused adults to expect a trap or trick question and often made them overthink the research and their answers instead of simply responding according to their (linguistic) intuition. In a possible follow-up, it might therefore be wise to make the adult experiment also more adjusted to its subjects.

Another adjustment that could be made in a follow-up experiment is the addition of more items for each test condition. In the set-up of this research, each condition was tested with only one item. In order to obtain more extensive data, each condition should preferably consist of at least three items or trials for each subject. This way, the effects of external influences, such as temporary loss of focus because of distractions, can be eliminated or at least diminished.

In addition to these improvements, there are some possible additions that might improve a follow-up experiment. The TVJ-task could, for instance, be accompanied by a Elicited Production task in order to test not only comprehension of the *ze/hen* distinction, but also production. A major issue herein is, of course, that a subject can always revert back to the use of pronoun *ze*, since that is correct in all contexts. Another addition could be the inclusion of more pronouns (varying in case and number). This way, the research will give a clearer overview of the pattern of emergence of the various pronouns and at what point the *hen/ze*

²² The child experiment contained the use of a puppet to try and decrease anxiety in the subjects.

distinction is acquired. One pronoun that would definitely be interesting to add is the 3rd person singular female pronoun, since it adheres to the same semantic distinction as *hen* and *ze*²³.

Another interesting addition would be the subjects' sensitivity to the [+human] feature of *hen* in a [+animacy] context. Perhaps children perceive a sharper contrast between [+human] and [-human] than between [+human] and [+animate], since [+animate] itself is a feature of [+human]. If that is the case, than subjects might struggle more with the correct reference of the pronoun *hen* in a [+animate] context than they do in a [-human] context. This could be achieved, for instance, by replacing the grocery bags in the final story, containing the HF condition, by dogs or cats.

Finally, it would be interesting to change the story containing the ZA condition in such a way that influences from yes-bias and pragmatics are eliminated or at least are made distinct and therefore observable. That way, more absolute conclusions can be made based on the gathered data.

6. Conclusion

To conclude, this thesis described, summarized and analyzed a research carried out on the semantic distinction between the 3rd person plural object pronouns *ze* and *hen*. This distinction entails a restriction on the possible reference of *hen* to [+human] contexts, whereas *ze* can be used in both [+human] as well as [-human] contexts. This research specifically looked at the knowledge of this distinction in children aged 4 - 6 and adults through means of 3 pictures stories and several TVJ-tasks and contained three main test conditions:

ZF *Ze False*

Testing the judgment of a **false statement** containing *ze* with an **ambiguous reference**

ZA *Ze Ambiguous*

Testing the judgment of an **ambiguous** statement containing *ze* with an **ambiguous reference**

²³ "The reduced non-subject form of the female singular '*r*' and '*d'r*' can only refer to people, the *ze* form to people and things" (Haeseryn 243).

HF *Hen False*

Testing the judgment of a **false statement** containing *hen* with an **unambiguous reference**.

The original hypothesis predicted that young children would not be aware of this semantic distinction due to the complexity of language acquisition and the Dutch pronominal system. They were expected to score well in the ZF condition, show no clear preference for the reference of the ZA item and would perform badly in the final, HF, condition. Adults, on the other hand were expected to perform well on both the ZF and the HF condition and also show no particular preference in the ZA condition. This hypothesis has, however, been invalidated by the findings of the research. Children showed a clear knowledge of the restriction on *hen*, whereas adults seemed to struggle with this semantic distinction between *hen* and *ze*, apparently allowing both pronouns in both [+/- human] contexts. This result has led to the formation of a renewed hypothesis that predicts a linguistic change from a syntactic based distinction between pronouns to a semantic based distinction. Additional research is needed to test this hypothesis and to gather more data on the use and knowledge of the *hen/ze* distinction.

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8. Appendix

8.1 Dutch pronoun paradigm

| | | | Subjective Case | | Objective Case | |
|----|----|---|-----------------|---------|----------------|---------|
| | | | Full | Reduced | Full | Reduced |
| 1p | Sg | | ik | 'k | mij | me |
| | Pl | | wij | we | ons | |
| 2p | Sg | T | jij | je | jou | je |
| | | V | u | | u | |
| | Pl | | jullie | | jullie | |
| 3p | Sg | M | hij | ie | hem | 'm |
| | | F | zij | ze | haar | (d)r |
| | | N | het | 't | het | 't |
| | Pl | | zij | ze | hen/hun | ze |

8.2 Data

Legend

| | |
|--|---|
| | Number of subjects |
| | Average |
| | Number of occurrences of 0 in the entire subject group |
| | Number of occurrences of T in the entire subject group (ZA) |
| | Percentage |
| | subject with incorrect judgment of HF |
| | Region of Birth of adult subject is Utrecht or the surrounding area |

Table 1. Results HEN-EXP children

sex: 0 = girl, 1 = boy; L1: 0 = mono-lingual, 1 = bilingual; V = version, ZF/HF: 0 = expected TVJ, 1 = unexpected TVJ; ZA: T = true, F = false; x = unclear/other; - = no answer

| ID | age | sex | L1 | V | ZF | ZA | HF |
|----|------|-----|----|---|----|----|----|
| 1 | 4,42 | 0 | 0 | 1 | 0 | T | 0 |
| 2 | 5,5 | 1 | 0 | 1 | 0 | T | 0 |
| 3 | 5,17 | 1 | 0 | 1 | 1 | T | 0 |
| 4 | 6,92 | 0 | 0 | 1 | 0 | F | 0 |
| 5 | 5,5 | 0 | 0 | 1 | 0 | T | 0 |

| | | | | | | | |
|----|------|-------|-------|---|-------|-----------------|-----------------|
| 6 | 5,83 | 1 | 0 | 2 | 0 | F | 0 |
| 7 | 6,42 | 0 | 0 | 2 | 0 | T | 0 |
| 8 | 4,08 | 1 | 0 | 2 | 0 | T | 0 |
| 9 | 4,83 | 0 | 0 | 2 | 0 | T | 0 |
| 10 | 5,25 | 1 | 0 | 1 | 0 | T | 0 |
| 11 | 5,92 | 0 | 0 | 1 | 0 | T | 0 |
| 12 | 5,08 | 1 | 0 | 1 | 0 | F | 0 |
| 13 | 4,83 | 1 | 0 | 1 | 0 | F | 0 |
| 14 | 6,66 | 1 | 0 | 1 | 0 | F | 0 |
| 15 | 6 | 1 | 0 | 2 | 0 | F | 1 |
| 16 | 6,08 | 0 | 0 | 2 | 0 | T | 0 |
| 17 | 5,08 | 1 | 0 | 2 | 0 | T | 1 |
| 18 | 5,75 | 1 | 0 | 2 | 0 | T | 1 |
| 19 | 6,5 | 0 | 0 | 2 | 0 | T | 0 |
| 20 | 5,58 | 0 | 0 | 2 | 1 | F | 1 |
| 21 | 5 | 1 | 0 | 2 | 1 | T | 0 |
| 22 | 5,5 | 1 | 0 | 1 | 0 | F | 0 |
| 23 | 5,4 | 0 | 0 | 2 | 0 | F | 0 |
| 24 | 5,33 | 1 | 0 | 2 | 1 | T | 0 |
| 25 | 4,75 | 0 | 0 | 2 | 0 | T | 0 |
| 26 | 5,83 | 1 | 0 | 2 | 0 | T | 0 |
| 27 | 4,66 | 1 | 0 | 2 | 0 | T | 0 |
| 28 | 4,75 | 0 | 0 | 2 | 0 | T | 0 ²⁴ |
| 29 | 6,08 | 0 | 0 | 2 | 0 | T | 0 |
| 30 | 5,17 | 1 | 0 | 2 | 0 | F | 0 |
| 31 | 6,08 | 0 | 0 | 2 | 0 | x ²⁵ | 0 |
| 32 | 4,66 | 0 | 0 | 2 | 0 | F | 0 |
| 33 | 5,92 | 1 | 0 | 2 | 0 | T | 0 |
| 34 | 6,33 | 1 | 0 | 2 | 0 | F | 0 |
| 35 | 6 | 0 | 0 | 2 | 0 | T | 0 |
| 36 | 5,17 | 1 | 0 | 2 | 0 | T | 0 |
| 37 | 5,17 | 1 | 0 | 2 | 0 | T | 1 ²⁶ |
| 38 | 5,58 | 1 | 0 | 2 | 0 | T | 0 |
| 39 | 6,08 | 1 | 0 | 2 | 0 | T | 0 |
| 40 | 5,92 | 1 | 0 | 2 | 0 | F | 0 |
| 41 | 4,58 | 1 | 0 | 2 | 0 | T | 0 |
| 42 | 6,08 | 0 | 0 | 2 | 0 | T | 0 |
| 43 | 6,33 | 1 | 0 | 2 | 0 | T | 0 |
| 44 | 5,42 | 0 | 0 | 2 | 0 | T | 0 |
| 45 | 4 | 0 | 0 | 2 | 0 | F | 1 |
| 46 | 5,83 | 1 | 1 | 2 | 0 | T | 0 |
| 46 | 5,50 | 19,00 | 45 | | 42 | 31 | 39 |
| | | 41,30 | 97,83 | | 91,30 | 67,39 | 84,78 |

²⁴ "de boodschappen wel, maar de jongens niet"

²⁵ "weet ik niet"

²⁶ "de jongens?" "dan is het fout"

Table 2.1 Results HEN-EXP adults

sex: 0 = female, 1 = male; L1: 0 = mono-lingual, 1 = bilingual; ZF/HF: 0 = expected TVJ, 1 = unexpected TVJ; ZA: T = True, F = False; x = unclear/other; - = unknown; RoB = Region of Birth, D = Dialect

| ID | age | sex | L1 | ZF | ZA | HF | RoB | D |
|----|-------|-----|----|----|----|----|-------------|---|
| 1 | 26 | 0 | 0 | 0 | T | 1 | Hardinxveld | 0 |
| 2 | 27 | 0 | 0 | 0 | T | 1 | Spijkenisse | 0 |
| 3 | 27 | 1 | 0 | 0 | T | 1 | Rijnsburg | 0 |
| 4 | 28 | 1 | 0 | 0 | T | 0 | Hardinxveld | 0 |
| 5 | 47 | 1 | 0 | 0 | T | 0 | Kampen | 0 |
| 7 | 55 | 1 | 0 | 0 | T | 0 | Ridderkerk | 0 |
| 8 | 59 | 0 | 0 | 0 | T | 0 | Ridderkerk | 0 |
| 9 | 73 | 0 | 0 | 0 | T | 0 | Utrecht | 0 |
| 10 | 74 | 0 | 0 | 0 | T | 1 | Hardinxveld | 0 |
| 11 | 83 | 0 | 0 | 0 | T | 0 | Ridderkerk | 0 |
| 12 | 38,66 | 0 | 0 | 0 | T | 0 | Gelderland | 0 |
| 13 | 39,42 | 0 | 0 | 0 | F | 1 | Brabant | 0 |
| 14 | 51,50 | 0 | 0 | 0 | F | 0 | A'foort | 0 |
| 15 | 41,08 | 0 | 0 | 0 | F | 1 | Utrecht | 0 |
| 16 | 54,75 | 1 | 0 | 0 | F | 1 | De Peel | 1 |
| 17 | 53,08 | 1 | 0 | 0 | T | 0 | Utrecht | 0 |
| 18 | 27,92 | 0 | 0 | 0 | T | 1 | Putten | 0 |
| 19 | 41,58 | 1 | 0 | 0 | T | 1 | Culemborg | 0 |
| 20 | 27,58 | 0 | 0 | 0 | T | 0 | t Gooi | 0 |
| 21 | 46,42 | 0 | 0 | 0 | T | 1 | Utrecht | 0 |
| 22 | 28,42 | 0 | 0 | 0 | T | 1 | Brabant | 0 |
| 23 | 37,92 | 0 | 0 | 0 | F | 0 | Achterhoek | 0 |
| 24 | 56,66 | 0 | 0 | 0 | T | 0 | Brabant | 0 |
| 25 | 53,17 | 0 | 0 | 0 | T | 0 | Roermond | 1 |
| 26 | 24,00 | 0 | 0 | 0 | T | 0 | M-NL | 0 |
| 27 | 39,33 | 1 | 0 | 0 | T | 1 | Z-O Brabant | 1 |
| 28 | ?? | 1 | 0 | 0 | T | 0 | Nieuwendijk | 1 |
| 29 | 46,75 | 0 | 0 | 0 | T | 1 | Z-O Brabant | 0 |
| 30 | 44,58 | 1 | 1 | 1 | F | 0 | Z-Holland | 0 |
| 31 | 30,42 | 1 | 0 | 0 | T | 1 | Helmond | 1 |
| 32 | 36,08 | 1 | 0 | 0 | F | 1 | Utrecht | 0 |
| 33 | 40,33 | 1 | 0 | 0 | T | 1 | N-NL | 0 |
| 34 | 48,75 | 0 | 0 | 0 | T | 1 | Alkmaar | 0 |
| 35 | 37,58 | 1 | 0 | 0 | T | 1 | Gooi | 0 |
| 36 | 42,92 | 1 | 0 | 0 | T | 0 | Utrecht | 0 |
| 37 | 23,66 | 1 | 0 | 0 | F | 1 | Utrecht | 0 |
| 38 | 30,42 | 1 | 0 | 0 | T | 0 | Oudewater | 0 |
| 39 | 49,08 | 1 | 0 | 0 | T | 0 | A'foort | 0 |
| 40 | 29,58 | 1 | 0 | 0 | F | 0 | Utrecht | 0 |
| 41 | 55,83 | 0 | 0 | 0 | F | 0 | Hilversum | 0 |
| 42 | 58,00 | 0 | 0 | 0 | F | 1 | N-Veluwe | 0 |
| 43 | 50,66 | 1 | 0 | 0 | F | 0 | Apeldoorn | 0 |
| 44 | 55,33 | 0 | 0 | - | T | 0 | Twente | 0 |
| 45 | 60,83 | 0 | 0 | 0 | T | 0 | Amsterdam | 0 |
| 46 | 26,25 | 1 | 0 | 0 | F | 0 | Utrecht | 0 |
| 47 | 21,92 | 0 | 0 | 0 | T | 1 | Leiden | 0 |

| | | | | | | | | |
|----|-------|-------|-------|-------|-------|-------|--------------|----|
| 48 | 22,58 | 1 | 0 | 0 | F | 1 | Veluwe | 0 |
| 49 | 27,66 | 1 | 0 | 0 | F | 1 | Utrecht | 0 |
| 50 | 23,17 | 0 | 0 | 0 | F | 0 | Utrecht | 0 |
| 51 | 21,5 | 1 | 0 | 0 | T | 0 | Nijmegen | 0 |
| 52 | 24,83 | 0 | 0 | 0 | F | 0 | Hei-en B'cop | 0 |
| 53 | 27 | 1 | 0 | 0 | T | 1 | Houten | 0 |
| 54 | 19,25 | 1 | 0 | 0 | T | 1 | Achterhoek | 0 |
| 55 | 21,5 | 0 | 0 | 0 | T | 1 | Driebergen | 0 |
| 56 | 55,33 | 1 | 0 | 0 | T | 1 | Bunnik | 0 |
| 57 | 27,17 | 1 | 0 | 0 | F | 0 | Utrecht | 0 |
| 58 | 25,83 | 0 | 0 | 0 | T | 1 | A'foort | 0 |
| 59 | 22,42 | 1 | 0 | 0 | F | 1 | Utrecht | 0 |
| 60 | 26,58 | 1 | 0 | 0 | F | 1 | A'foort | 0 |
| 61 | 60 | 0 | 0 | 0 | F | 0 | Rhenoy | 0 |
| 62 | 25,92 | 1 | 0 | 0 | T | 1 | Utrecht | 0 |
| 63 | 28 | 1 | 0 | 0 | F | 1 | Utrecht | 0 |
| 64 | 27 | 1 | 0 | 0 | T | 1 | Kamerik | 0 |
| 65 | 23,5 | 1 | 0 | 0 | T | 0 | A'foort | 0 |
| 66 | 27,83 | 1 | 0 | 0 | T | 0 | A'foort | 0 |
| 67 | 51,42 | 0 | 0 | 0 | F | 0 | Utrecht | 0 |
| 66 | 39,05 | 31 | 65 | 64 | 43 | 33 | 36 | 61 |
| | | 46,97 | 98,48 | 96,97 | 65,15 | 50,00 | 54,55 | 92 |

Table 2.2 Results HEN-EXP adults from Utrecht and surrounding areas

| ID | age | sex | L1 | V | ZF | ZA | HF | RoB | D |
|----|-------|-----|----|---|----|----|----|------------|---|
| 9 | 73 | 0 | 0 | 2 | 0 | T | 0 | Utrecht | 0 |
| 12 | 38,66 | 0 | 0 | 2 | 0 | T | 0 | Gelderland | 0 |
| 14 | 51,5 | 0 | 0 | 2 | 0 | F | 0 | A'foort | 0 |
| 15 | 41,08 | 0 | 0 | 2 | 0 | F | 1 | Utrecht | 0 |
| 17 | 53,08 | 1 | 0 | 2 | 0 | T | 0 | Utrecht | 0 |
| 19 | 41,58 | 1 | 0 | 2 | 0 | T | 1 | Culemborg | 0 |
| 20 | 27,58 | 0 | 0 | 2 | 0 | T | 0 | t Gooi | 0 |
| 21 | 46,42 | 0 | 0 | 2 | 0 | T | 1 | Utrecht | 0 |
| 26 | 24,00 | 0 | 0 | 2 | 0 | T | 0 | M-NL | 0 |
| 30 | 44,58 | 1 | 1 | 2 | 1 | F | 0 | Z-Holland | 0 |
| 32 | 36,08 | 1 | 0 | 2 | 0 | F | 1 | Utrecht | 0 |
| 35 | 37,58 | 1 | 0 | 2 | 0 | T | 1 | Gooi | 0 |
| 36 | 42,92 | 1 | 0 | 2 | 0 | T | 0 | Utrecht | 0 |
| 37 | 23,66 | 1 | 0 | 2 | 0 | F | 1 | Utrecht | 0 |
| 38 | 30,42 | 1 | 0 | 2 | 0 | T | 0 | Oudewater | 0 |
| 39 | 49,08 | 1 | 0 | 2 | 0 | T | 0 | A'foort | 0 |
| 40 | 29,58 | 1 | 0 | 2 | 0 | F | 0 | Utrecht | 0 |
| 41 | 55,83 | 0 | 0 | 2 | 0 | F | 0 | Hilversum | 0 |
| 46 | 26,25 | 1 | 0 | 2 | 0 | F | 0 | Utrecht | 0 |
| 49 | 27,66 | 1 | 0 | 2 | 0 | F | 1 | Utrecht | 0 |
| 50 | 23,17 | 0 | 0 | 2 | 0 | F | 0 | Utrecht | 0 |
| 52 | 24,83 | 0 | 0 | 2 | 0 | F | 0 | Heicop | 0 |
| 53 | 27,00 | 1 | 0 | 2 | 0 | T | 1 | Houten | 0 |
| 55 | 21,50 | 0 | 0 | 2 | 0 | T | 1 | Driebergen | 0 |
| 56 | 55,33 | 1 | 0 | 2 | 0 | T | 1 | Bunnik | 0 |

| | | | | | | | | | |
|----|-------|-------|-------|---|-------|-------|-------|------------|-----|
| 57 | 27,17 | 1 | 0 | 2 | 0 | F | 0 | Utrecht | 0 |
| 58 | 25,83 | 0 | 0 | 2 | 0 | T | 1 | A'foort | 0 |
| 59 | 22,42 | 1 | 0 | 2 | 0 | F | 1 | Utrecht | 0 |
| 60 | 26,58 | 1 | 0 | 2 | 0 | F | 1 | A'foort | 0 |
| 61 | 60,00 | 0 | 0 | 2 | 0 | F | 0 | Rhenoy | 0 |
| 62 | 25,92 | 1 | 0 | 2 | 0 | T | 1 | Utrecht | 0 |
| 63 | 28,00 | 1 | 0 | 2 | 0 | F | 1 | Utrecht | 0 |
| 64 | 27,00 | 1 | 0 | 2 | 0 | T | 1 | Kamerik | 0 |
| 65 | 23,50 | 1 | 0 | 2 | 0 | T | 0 | Amersfoort | 0 |
| 66 | 27,83 | 1 | 0 | 2 | 0 | T | 0 | Amersfoort | 0 |
| 67 | 51,42 | 0 | 0 | 2 | 0 | F | 0 | Utrecht | 0 |
| 36 | 36,06 | 14 | 35 | | 35 | 19 | 20 | | 36 |
| | | 38,89 | 97,22 | | 97,22 | 52,78 | 55,56 | | 100 |

Table 3.1 Control data of child subjects with unexpected HF TVJ

sex: 0 = girl, 1 = boy; LI: 0 = mono-lingual, 1 = bilingual; V = version, F/T/ZF/HF: 0 = expected TVJ, 1 = unexpected TVJ; ZA: T = true, F = false; x = unclear/other; - = no answer

| ID | F | | | | score | T | | | | | | score |
|----|---|---|---|---|-------|---|---|---|---|---|---|-------|
| | 1 | 2 | 3 | 4 | | 1 | 2 | 3 | 4 | 5 | 6 | |
| 15 | 0 | 0 | 0 | 0 | 1,00 | 0 | 0 | 0 | 0 | 0 | 0 | 1,00 |
| 17 | 0 | 0 | 0 | 0 | 1,00 | 0 | 0 | 0 | 0 | 0 | 0 | 1,00 |
| 18 | 0 | 0 | 0 | 0 | 1,00 | 0 | 0 | 0 | 0 | 0 | 0 | 1,00 |
| 20 | 0 | 0 | 1 | 0 | 0,75 | 0 | 0 | 0 | 0 | 0 | 0 | 1,00 |
| 37 | 0 | 0 | 0 | 0 | 1,00 | 0 | 0 | 0 | 0 | 0 | 0 | 1,00 |
| 45 | - | - | 0 | 0 | 1,00 | - | - | 0 | 0 | 0 | 0 | 1,00 |
| 6 | | | | | 0,96 | | | | | | | 1,00 |

Table 3.2 Test data of child subjects with unexpected HF TVJ

| ID | age | sex | V | ZF | ZA | HF |
|----|------|-------|-----|----|----|-----|
| 15 | 6 | 1 | 2 | 0 | F | 1 |
| 17 | 5,08 | 1 | 2 | 0 | T | 1 |
| 18 | 5,75 | 1 | 2 | 0 | T | 1 |
| 20 | 5,58 | 0 | 2 | 1 | F | 1 |
| 37 | 5,17 | 1 | 2 | 0 | T | 1 |
| 45 | 4 | 0 | 2 | 0 | F | 1 |
| 6 | 5,26 | 2 | 6 | 4 | 2 | 6 |
| | | 33,33 | 100 | 80 | 40 | 100 |

Table 3.3 Test data of adult subjects with unexpected HF TVJ

sex: 0 = girl, 1 = boy; L1: 0 = mono-lingual, 1 = bilingual; V = version, ZF/HF: 0 = expected TVJ, 1 = unexpected TVJ; ZA: T = True, F = False; x = unclear/other; - = unknown; RoB = Region of Birth, D = Dialect

| ID | age | sex | L1 | ZF | ZA | HF | RoB | D |
|----|-------|-------|----|-----|-------|----|---------------|-------|
| 1 | 26 | 0 | 0 | 0 | | T | 1 Hardinxveld | 0 |
| 2 | 27 | 0 | 0 | 0 | | T | 1 Spijkenisse | 0 |
| 3 | 27 | 1 | 0 | 0 | | T | 1 Rijnsburg | 0 |
| 10 | 74 | 0 | 0 | 0 | | T | 1 Hardinxveld | 0 |
| 13 | 39,42 | 0 | 0 | 0 | | F | 1 Brabant | 0 |
| 15 | 41,08 | 0 | 0 | 0 | | F | 1 Utrecht | 0 |
| 16 | 54,75 | 1 | 0 | 0 | | F | 1 De Peel | 1 |
| 18 | 27,92 | 0 | 0 | 0 | | T | 1 Putten | 0 |
| 19 | 41,58 | 1 | 0 | 0 | | T | 1 Culemborg | 0 |
| 21 | 46,42 | 0 | 0 | 0 | | T | 1 Utrecht | 0 |
| 22 | 28,42 | 0 | 0 | 0 | | T | 1 Brabant | 0 |
| 27 | 39,33 | 1 | 0 | 0 | | T | 1 Z-O Brabant | 1 |
| 29 | 46,75 | 0 | 0 | 0 | | T | 1 Z-O Brabant | 0 |
| 31 | 30,42 | 1 | 0 | 0 | | T | 1 Helmond | 1 |
| 32 | 36,08 | 1 | 0 | 0 | | F | 1 Utrecht | 0 |
| 33 | 40,33 | 1 | 0 | 0 | | T | 1 N-NL | 0 |
| 34 | 48,75 | 0 | 0 | 0 | | T | 1 Alkmaar | 0 |
| 35 | 37,58 | 1 | 0 | 0 | | T | 1 Gooi | 0 |
| 37 | 23,66 | 1 | 0 | 0 | | F | 1 Utrecht | 0 |
| 42 | 58,00 | 0 | 0 | 0 | | F | 1 N-Veluwe | 0 |
| 47 | 21,92 | 0 | 0 | 0 | | T | 1 Leiden | 0 |
| 48 | 22,58 | 1 | 0 | 0 | | F | 1 Veluwe | 0 |
| 49 | 27,66 | 1 | 0 | 0 | | F | 1 Utrecht | 0 |
| 53 | 27 | 1 | 0 | 0 | | T | 1 Houten | 0 |
| 54 | 19,25 | 1 | 0 | 0 | | T | 1 Achterhoek | 0 |
| 55 | 21,5 | 0 | 0 | 0 | | T | 1 Driebergen | 0 |
| 56 | 55,33 | 1 | 0 | 0 | | T | 1 Bunnik | 0 |
| 58 | 25,83 | 0 | 0 | 0 | | T | 1 A'foort | 0 |
| 59 | 22,42 | 1 | 0 | 0 | | F | 1 Utrecht | 0 |
| 60 | 26,58 | 1 | 0 | 0 | | F | 1 A'foort | 0 |
| 62 | 25,92 | 1 | 0 | 0 | | T | 1 Utrecht | 0 |
| 63 | 28 | 1 | 0 | 0 | | F | 1 Utrecht | 0 |
| 64 | 27 | 1 | 0 | 0 | | T | 1 Kamerik | 0 |
| 33 | 34,71 | 14 | | 33 | 22 | | 16 | 30 |
| | | 42,42 | | 100 | 66,67 | | 48,48 | 90,91 |

Table 4.1 Data F control-items child HEN-EXP

| ID | age | sex | L1 | V | F | | | | score |
|----|------|-------|-------|---|-------|-----|-------|-----|-------|
| | | | | | 1 | 2 | 3 | 4 | |
| 1 | 4.42 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 1 |
| 2 | 5.50 | 1 | 0 | 1 | 0 | 0 | 0 | 0 | 1 |
| 3 | 5.17 | 1 | 0 | 1 | 0 | 0 | 0 | 0 | 1 |
| 4 | 6.92 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 1 |
| 5 | 5.50 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 1 |
| 6 | 5.83 | 1 | 0 | 2 | 0 | 0 | 0 | 0 | 1 |
| 7 | 6.42 | 0 | 0 | 2 | 0 | 0 | 0 | 0 | 1 |
| 8 | 4.08 | 1 | 0 | 2 | 0 | 0 | 0 | 0 | 1 |
| 9 | 4.83 | 0 | 0 | 2 | 0 | 0 | 0 | 0 | 1 |
| 10 | 5.25 | 1 | 0 | 1 | 0 | 0 | 0 | 0 | 1 |
| 11 | 5.92 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 1 |
| 12 | 5.08 | 1 | 0 | 1 | 1 | 0 | 0 | 0 | 0,75 |
| 13 | 4.83 | 1 | 0 | 1 | 0 | 0 | 0 | 0 | 1 |
| 14 | 6.66 | 1 | 0 | 1 | 0 | 0 | 0 | 0 | 1 |
| 15 | 6.00 | 1 | 0 | 2 | 0 | 0 | 0 | 0 | 1 |
| 16 | 6.08 | 0 | 0 | 2 | 0 | 0 | 0 | 0 | 1 |
| 17 | 5.08 | 1 | 0 | 2 | 0 | 0 | 0 | 0 | 1 |
| 18 | 5.75 | 1 | 0 | 2 | 0 | 0 | 0 | 0 | 1 |
| 19 | 6.50 | 0 | 0 | 2 | 0 | 0 | 0 | 0 | 1 |
| 20 | 5.58 | 0 | 0 | 2 | 0 | 0 | 1 | 0 | 0,75 |
| 21 | 5.00 | 1 | 0 | 2 | 0 | 0 | 0 | 0 | 1 |
| 22 | 5.50 | 1 | 0 | 1 | 0 | 0 | 0 | 0 | 1 |
| 23 | 5.40 | 0 | 0 | 2 | 0 | 0 | 0 | 0 | 1 |
| 24 | 5.33 | 1 | 0 | 2 | 0 | 0 | 0 | 0 | 1 |
| 25 | 4.75 | 0 | 0 | 2 | 0 | 0 | 0 | 0 | 1 |
| 26 | 5.83 | 1 | 0 | 2 | 0 | 0 | 0 | 0 | 1 |
| 27 | 4.66 | 1 | 0 | 2 | 0 | 0 | 0 | 0 | 1 |
| 28 | 4.75 | 0 | 0 | 2 | 0 | 0 | 0 | 0 | 1 |
| 29 | 6.08 | 0 | 0 | 2 | 0 | 0 | 0 | 0 | 1 |
| 30 | 5.17 | 1 | 0 | 2 | 0 | 0 | 0 | 0 | 1 |
| 31 | 6.08 | 0 | 0 | 2 | 0 | 0 | 0 | 0 | 1 |
| 32 | 4.66 | 0 | 0 | 2 | 0 | 0 | 0 | 0 | 1 |
| 33 | 5.92 | 1 | 0 | 2 | 0 | 0 | 0 | 0 | 1 |
| 34 | 6.33 | 1 | 0 | 2 | 0 | 0 | 0 | 0 | 1 |
| 35 | 6.00 | 0 | 0 | 2 | 0 | 0 | 0 | 0 | 1 |
| 36 | 5.17 | 1 | 0 | 2 | 0 | 0 | 0 | 0 | 1 |
| 37 | 5.17 | 1 | 0 | 2 | 0 | 0 | 0 | 0 | 1 |
| 38 | 5.58 | 1 | 0 | 2 | 0 | 0 | 0 | 0 | 1 |
| 39 | 6.08 | 1 | 0 | 2 | 0 | 0 | 0 | 0 | 1 |
| 40 | 5.92 | 1 | 0 | 2 | 0 | 0 | 0 | 0 | 1 |
| 41 | 4.58 | 1 | 0 | 2 | 0 | 0 | 0 | 0 | 1 |
| 42 | 6.08 | 0 | 0 | 2 | 0 | 0 | 0 | 0 | 1 |
| 43 | 6.33 | 1 | 0 | 2 | 0 | 0 | 0 | 0 | 1 |
| 44 | 5.42 | 0 | 0 | 2 | - | - | 0 | 0 | 1 |
| 45 | 4.00 | 0 | 0 | 2 | - | - | 0 | 0 | 1 |
| 46 | 5.83 | 1 | 1 | 2 | - | - | 0 | 0 | 1 |
| 46 | 5,50 | 19,00 | 45 | | 42 | 43 | 45 | 46 | |
| | | 41,30 | 97,83 | | 97,67 | 100 | 97,83 | 100 | 0,99 |

Table 4.2 Data T control-items child HEN-EXP

| ID | age | sex | L1 | V | T | | | | | | score |
|----|------|-------|-------|---|-------|-------|-------|-------|-------|-------|-------|
| | | | | | 1 | 2 | 3 | 4 | 5 | 6 | |
| 1 | 4.42 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 1 |
| 2 | 5.50 | 1 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 1 |
| 3 | 5.17 | 1 | 0 | 1 | 1 | 0 | 0 | 0 | 0 | 0 | 0,83 |
| 4 | 6.92 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 1 | 0 | 0,83 |
| 5 | 5.50 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 1 |
| 6 | 5.83 | 1 | 0 | 2 | 0 | 0 | 0 | 0 | 0 | 0 | 1 |
| 7 | 6.42 | 0 | 0 | 2 | 0 | 0 | 0 | 0 | 0 | 0 | 1 |
| 8 | 4.08 | 1 | 0 | 2 | 1 | 0 | 0 | 0 | 0 | 1 | 0,83 |
| 9 | 4.83 | 0 | 0 | 2 | 0 | 0 | 0 | 0 | 0 | 0 | 1 |
| 10 | 5.25 | 1 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 1 |
| 11 | 5.92 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 1 |
| 12 | 5.08 | 1 | 0 | 1 | 0 | 0 | 0 | 1 | 0 | 0 | 0,83 |
| 13 | 4.83 | 1 | 0 | 1 | 0 | 1 | 0 | 0 | 0 | 0 | 0,83 |
| 14 | 6.66 | 1 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 1 |
| 15 | 6.00 | 1 | 0 | 2 | 0 | 0 | 0 | 0 | 0 | 0 | 1 |
| 16 | 6.08 | 0 | 0 | 2 | 1 | 0 | 0 | 0 | 0 | 0 | 0,83 |
| 17 | 5.08 | 1 | 0 | 2 | 0 | 0 | 0 | 0 | 0 | 0 | 1 |
| 18 | 5.75 | 1 | 0 | 2 | 0 | 0 | 0 | 0 | 0 | 0 | 1 |
| 19 | 6.50 | 0 | 0 | 2 | 0 | 0 | 0 | 0 | 0 | 0 | 1 |
| 20 | 5.58 | 0 | 0 | 2 | 0 | 0 | 0 | 0 | 0 | 0 | 1 |
| 21 | 5.00 | 1 | 0 | 2 | 0 | 0 | 0 | 0 | 0 | 0 | 1 |
| 22 | 5.50 | 1 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 1 |
| 23 | 5.40 | 0 | 0 | 2 | 0 | 0 | 0 | 0 | 0 | 0 | 1 |
| 24 | 5.33 | 1 | 0 | 2 | 0 | 0 | 0 | 1 | 0 | 0 | 0,83 |
| 25 | 4.75 | 0 | 0 | 2 | 0 | 0 | 0 | 0 | 0 | 1 | 0,83 |
| 26 | 5.83 | 1 | 0 | 2 | 0 | 0 | 0 | 0 | 0 | 0 | 1 |
| 27 | 4.66 | 1 | 0 | 2 | 0 | 0 | 0 | 0 | 0 | 0 | 1 |
| 28 | 4.75 | 0 | 0 | 2 | 1 | 0 | 0 | 0 | 0 | 0 | 0,83 |
| 29 | 6.08 | 0 | 0 | 2 | 0 | 0 | 0 | 0 | 0 | 0 | 1 |
| 30 | 5.17 | 1 | 0 | 2 | 0 | 0 | 0 | 0 | 0 | 0 | 1 |
| 31 | 6.08 | 0 | 0 | 2 | 0 | 0 | 0 | 0 | 0 | 0 | 1 |
| 32 | 4.66 | 0 | 0 | 2 | 0 | 0 | 0 | 0 | 1 | 1 | 0,67 |
| 33 | 5.92 | 1 | 0 | 2 | 0 | 0 | 1 | 0 | 0 | 0 | 0,83 |
| 34 | 6.33 | 1 | 0 | 2 | 0 | 0 | 0 | 0 | 0 | 0 | 1 |
| 35 | 6.00 | 0 | 0 | 2 | 0 | 0 | 0 | 0 | 0 | 0 | 1 |
| 36 | 5.17 | 1 | 0 | 2 | 0 | 0 | 0 | 0 | 0 | 0 | 1 |
| 37 | 5.17 | 1 | 0 | 2 | 0 | 0 | 0 | 0 | 0 | 0 | 1 |
| 38 | 5.58 | 1 | 0 | 2 | 0 | 0 | 0 | 0 | 0 | 0 | 1 |
| 39 | 6.08 | 1 | 0 | 2 | 0 | 0 | 0 | 0 | 0 | 0 | 1 |
| 40 | 5.92 | 1 | 0 | 2 | 0 | 0 | 0 | 0 | 0 | 0 | 1 |
| 41 | 4.58 | 1 | 0 | 2 | 1 | 0 | 0 | 0 | 0 | 0 | 0,83 |
| 42 | 6.08 | 0 | 0 | 2 | 0 | 0 | 0 | 0 | 0 | 0 | 1 |
| 43 | 6.33 | 1 | 0 | 2 | 0 | 0 | 0 | 0 | 0 | 0 | 1 |
| 44 | 5.42 | 0 | 0 | 2 | - | - | 0 | 0 | 0 | 0 | 1 |
| 45 | 4.00 | 0 | 0 | 2 | - | - | 0 | 0 | 0 | 0 | 1 |
| 46 | 5.83 | 1 | 1 | 2 | - | - | 0 | 0 | 0 | 0 | 1 |
| 46 | 5,50 | 19,00 | 45 | | 38 | 42 | 45 | 44 | 44 | 43 | |
| | | 41,30 | 97,83 | | 88,37 | 97,67 | 97,83 | 95,65 | 95,65 | 93,48 | 0,95 |

8.3 Materials

8.3.1 Practice story

8.3.1.1 Practice story 1: the girl, her dog and the swing

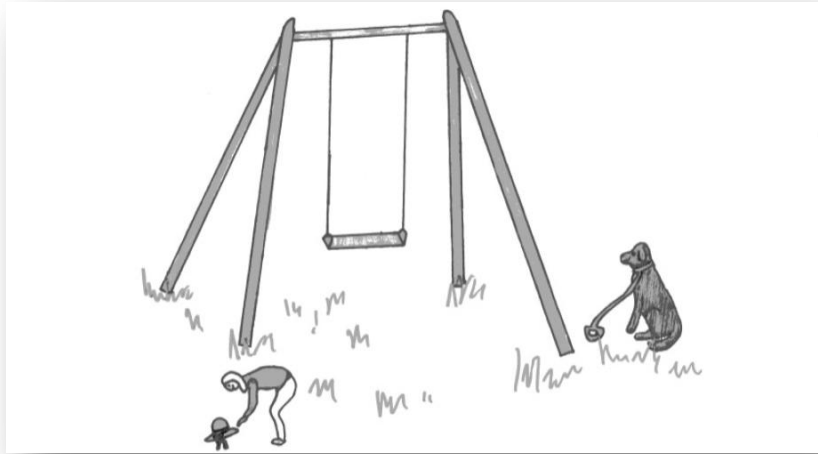
We gaan Drakie vandaag dus helpen dingen goed te onthouden. We gaan samen naar de plaatjes kijken die in deze map staan, en ik ga daar verhaaltjes bij vertellen. Maar Drakie mag de plaatjes niet zien, omdat hij goed moet luisteren. En om te kijken of hij wel echt goed heeft geluisterd, ga ik Drakie af en toe een vraag stellen over het verhaaltje. Jij mag steeds zeggen of hij het goed of fout heeft. Elke keer als Drakie het goed heeft, dan mag je zo'n mooie groene knikker in zijn bakje doen. Maar elke keer als het fout is dan krijgt hij een saaie zwarte knoop. Dan kunnen we op het eind zien of Drakie het goed heeft gedaan. Okee? We gaan nu nog even oefenen.

1



Nou Drakie, wij kijken nu naar een plaatje met een schommel. Op het plaatje staat een meisje. Ze heeft haar hond meegenomen en ze heeft ook een hoed op. Ze gaat schommelen.

2



Het meisje legt haar hoed in het gras, want anders blaast de wind hem nog van haar hoofd als ze schommelt!

3



Nu schommelt ze. Het meisje heeft de riem van de hond gewoon los in het gras gelegd. De hond blijft netjes zitten en kijkt naar het meisje.

4



En nu gaan ze weer weg. O ow, het meisje vergeet haar hoed...

Nou Drakie, vertel ons eens iets wat er is gebeurd.

(Terugbladeren en coaching toegestaan)

(1) Puppert T → Child TVJ: *Het meisje had haar hond meegenomen naar de schommel.*

En zeg nu eens iets wat het meisje deed OF wat de hond deed tijdens het schommelen.

(2) Puppert T (...OF...) → Child TVJ: *De hond zat te kijken.*

Hartstikke goed! Zeg nog eens iets over het verhaal.

(3) Puppert F → Child TVJ: *Het meisje had de hond op de schommel gezet.*

Dat was fout. Zeg nu eens iets wat er NIET is gebeurd, Drakie.

(4) Puppert T (negative) → Child TVJ: *Het meisje heeft de hond NIET aan de schommel vastgebonden.*

Goedzo Drakie. Probeer het nog eens.

(5) Puppert (F negative) → Child TVJ: *Het meisje heeft NIET haar hoed vergeten.*

Goed gedaan! (tegen het kind).

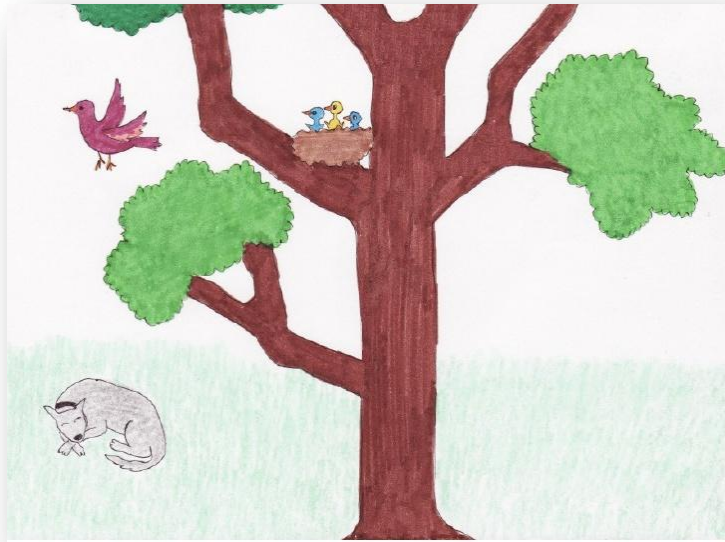
Genoeg geoefend. Nu gaan we echt beginnen

(Bij veel coaching / 1 fout antwoord: back-up verhaal)

Laten we nog een verhaaltje oefenen.

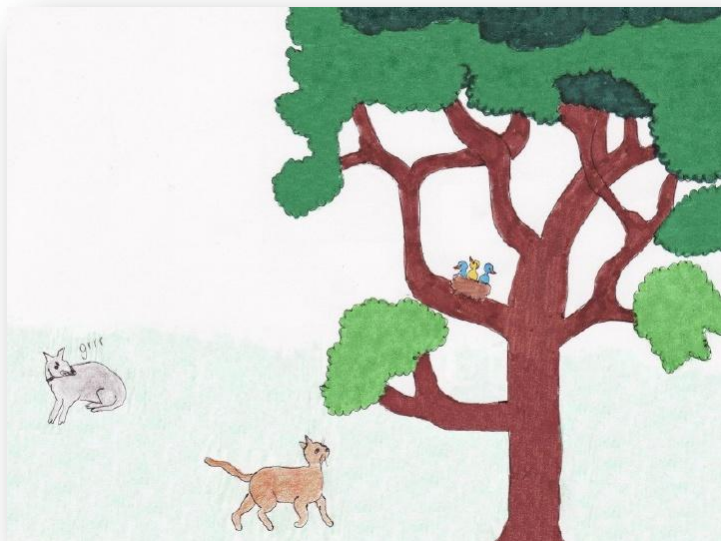
8.3.1.2 Practice story 2: the birds, the cat and the dog

1



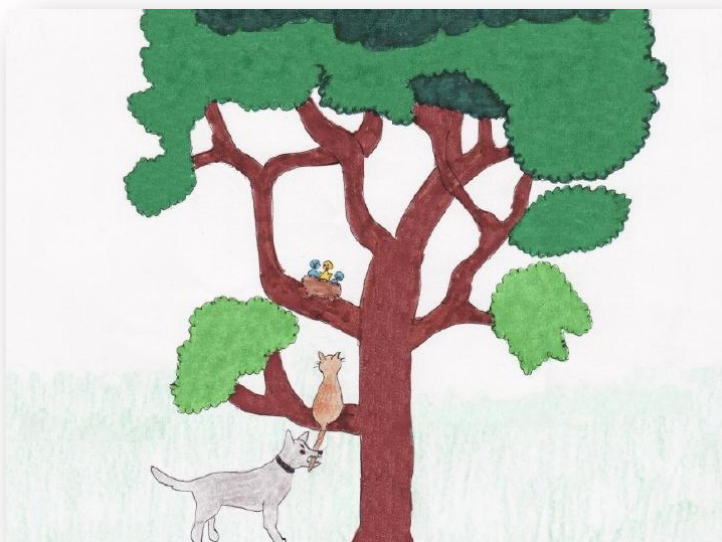
Hier zie je een mamavogel met haar drie kinderen. De vogeltjes hebben honger, dus de mama gaat eten voor ze zoeken. Onderaan de boom ligt een hond te slapen.

2



Maar dan komt er een poes. Die wil de vogeltjes opeten! De hond wordt wakker en gromt heel hard. Hij wil de poes bij de vogeltjes weggagen.

3



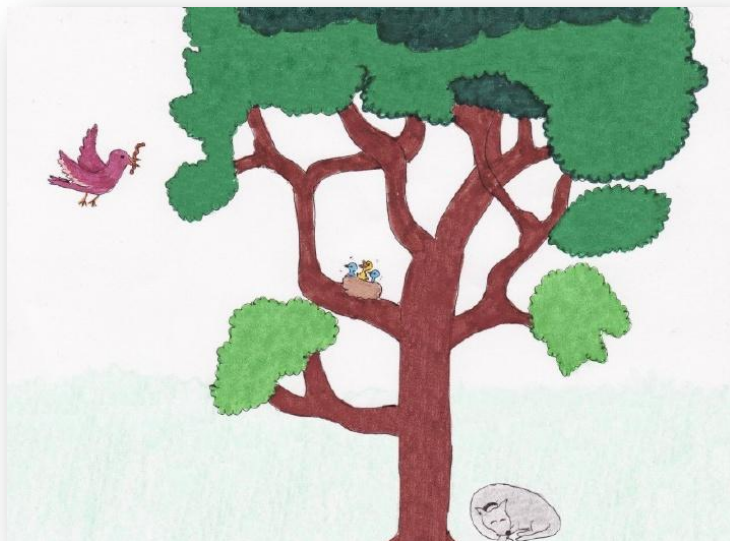
De poes zit al op de eerste tak van de boom! Snel bijt de hond in zijn staart.

4



De poes schrikt zo dat hij hard wegrent! Nu zijn de vogeltjes weer veilig!

5



Dan komt de mamavogel weer terug met eten. En de hond gaat weer slapen.
Nou Drakie, dat was een spannend verhaaltje he! Eens zien of je wel goed hebt opgelet.

Wat ging de moedervogel ook alweer doen? (*Terugbladeren en coaching niet toegestaan*)
(6) Puppert F → Child TVJ: *De moedervogel ging een jurk kopen.*

Nee joh Drakie, ze ging eten halen! Dat was zeker een grapje van je.

Zeg nu eens iets wat de hond deed OF wat de poes deed.
(7) Puppert T (...OF...) → Child TVJ: *De poes klom in de boom.*

Helemaal goed! Zeg nu eens iets wat er NIET is gebeurd, Drakie.
(8) Puppert T (negative) → Child TVJ: *De poes heeft de vogeltjes NIET gevangen.*

Goedzo Drakie. Wat is er nog meer NIET gebeurd?
(9) Puppert (F negative) → Child TVJ: *De hond ging NIET in de staart van de poes bijten.*

Goed gedaan! (tegen het kind).
Genoeg geoefend. Nu gaan we echt beginnen.

8.3.2 Suzanne

1



Dit is Suzanne. Suzanne is jarig en is een spel aan het spelen met haar drie zusjes.

Drakie, kun je ons vertellen wat er met Suzanne aan de hand is?

(7) Puppet T → Child TVJ: *Suzanne is jarig*

Heel goed! En wat kun je nog meer vertellen over Suzanne of haar zusjes?

(8) Puppet F (...OF...) → Child TVJ: *Suzanne heeft 2 zusjes*

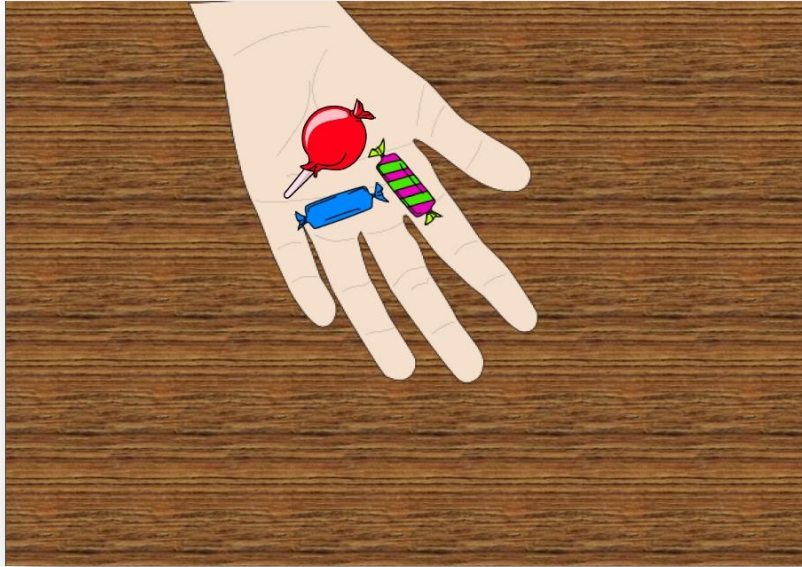
(To child) Nee hè? Dat klopt niet! Suzanne heeft 3 zusjes!

2



Suzanne stuurt haar zusjes naar de keuken.

3



Suzanne heeft van haar mama 3 snoepjes gekregen, twee zuurtjes en een lollie.

4



Ze gaat de 3 snoepjes verstoppen voor haar zusjes. Eerst wilde ze de snoepjes in de mand verstoppen, maar dat is te makkelijk. Suzanne verstoppt de snoepjes dus maar achter de bank.

5



Nu mogen Suzanne's zusjes terugkomen om de snoepjes te zoeken.

Drakie, kun je vertellen wat voor snoepjes Suzanne heeft?

(9) Puppet T → Child TVJ: *Twee zuurtjes en een lollie*

Goed zo! En wat is er met de snoepjes of de zusjes gebeurd?

(10) Puppet ZF (...OF...) → Child TVJ: *Ze heeft ze in de mand gelegd*

Nee Drakie, dat klopt niet! De snoepjes liggen achter de bank!

6



Ah! Kijk! Één van de zusjes van Suzanne heeft de snoepjes gevonden! Nu kunnen ze ze lekker opsmikkelen!

8.3.3 Tom

1



Dit is Tom. Tom is buiten aan het spelen met zijn twee vrienden. Tom's honden zijn ook buiten en zijn bij de tent aan het spelen.

Drakie, vertel eens iets over Tom of de honden.

(17) Puppet T (...OF...) → Child TVJ: *Tom heeft 2 vrienden*

Inderdaad! En waar zijn de honden van Tom?

(18) Puppet F → Child TVJ: *De honden zitten in de tent*

Nee, Drakie je hebt niet goed opgelet!

2



Tom zegt tegen zijn vrienden: "Gaan jullie maar vast in de tent zitten". De honden lopen alleen in de weg, dus Tom stuurt ze naar binnen.

Ok, Drakie. Vertel eens wat er met de honden of met de twee vrienden van Tom is gebeurd?
(19) Puppet ZA (...OF...) → Child TVJ: *Hij heeft ze het huis ingestuurd*

Inderdaad! Die was weer goed!

Laten we snel doorgaan met het volgende verhaaltje.

8.3.4 Moeder

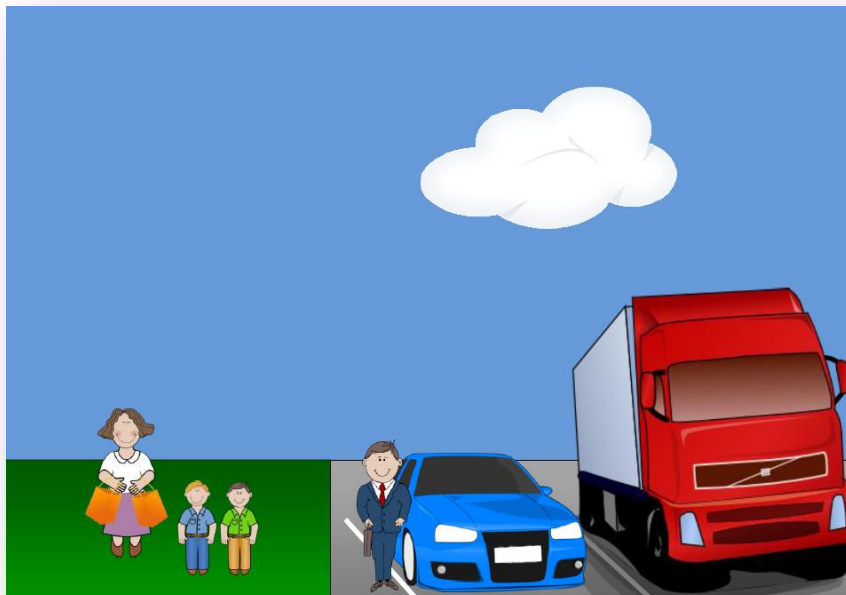
8.3.4.1 Version 1

1



Mama heeft met haar twee zoons boodschappen gedaan. Ze heeft 2 zware tassen vol boodschappen bij zich!

2



Ze lopen samen naar de parkeerplaats. Er staat een grote rode vrachtwagen op de parkeerplaats. Naast de vrachtwagen staat papa al te wachten met de auto om de zware boodschappen naar huis te brengen.

3



Mama zet de boodschappen in de auto.

Drakie, vertel eens iets over de vrachtwagen of de auto

(26) Puppert T (...OF...) → Child TVJ: *De vrachtwagen is rood*

Inderdaad!

4



Zelf gaat mama met de bakfiets naar huis. Ze zet haar twee zoons voorin de bak van de bakfiets. En ze fietst naar huis.

Ok, Drakie, kun je vertellen wat er met de boodschappen of de kinderen is gebeurd?

(27) Puppert HF (...OF...) → Child TVJ: *Ze heeft hen in de auto gezet*

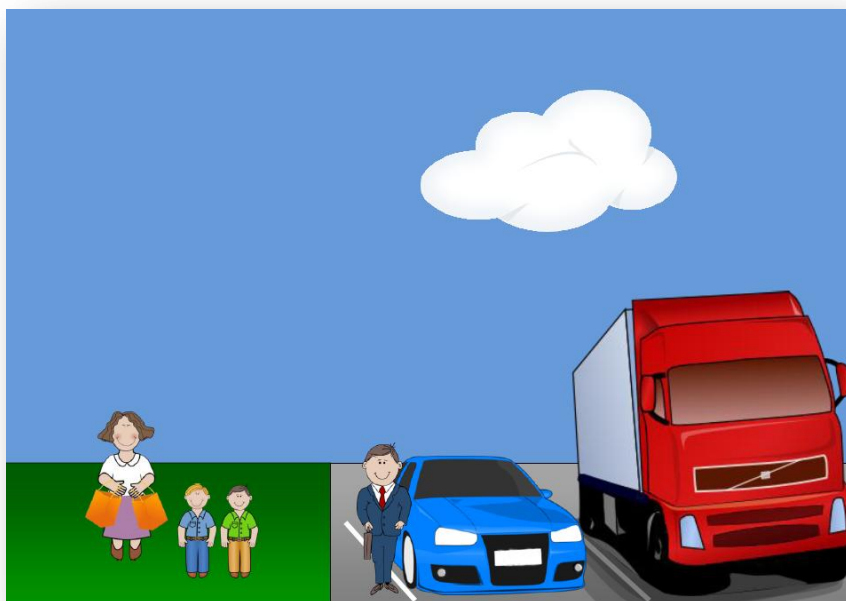
8.3.4.2 Version 2

1



Mama heeft met haar twee zoons boodschappen gedaan. Ze heeft 2 zware tassen vol boodschappen bij zich!

2



Ze lopen samen naar de parkeerplaats. Er staat een grote rode vrachtwagen op de parkeerplaats. Naast de vrachtwagen staat papa al te wachten met de auto om de jongens naar huis te brengen.

3



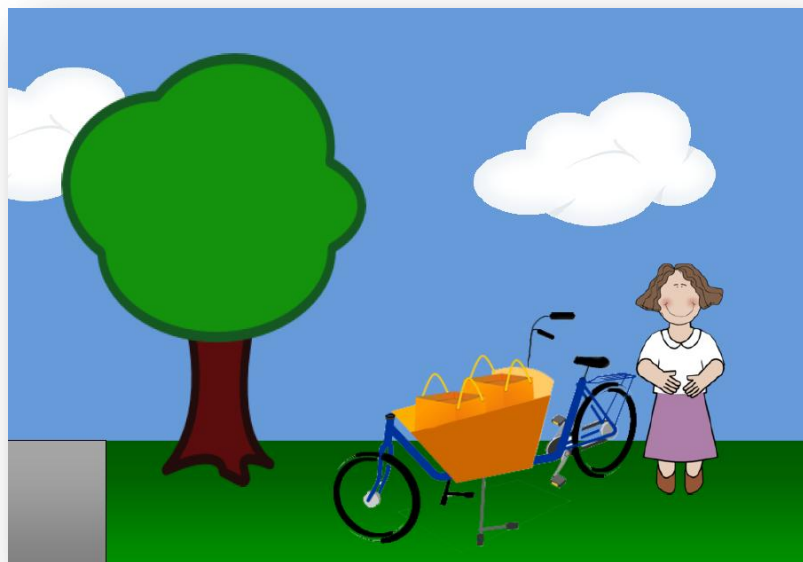
Mama zet de jongens in de auto.

Drakie, vertel eens iets over de vrachtwagen of de auto

(26) Puppert T (...OF...) → Child TVJ: *De vrachtwagen is rood*

Inderdaad!

4

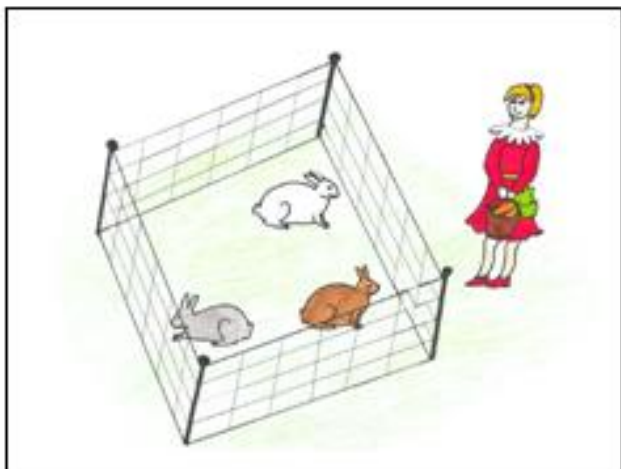


Zelf gaat mama met de bakfiets naar huis. Ze zet haar twee boodschappentassen voorin de bak van de bakfiets. En ze fietst naar huis.

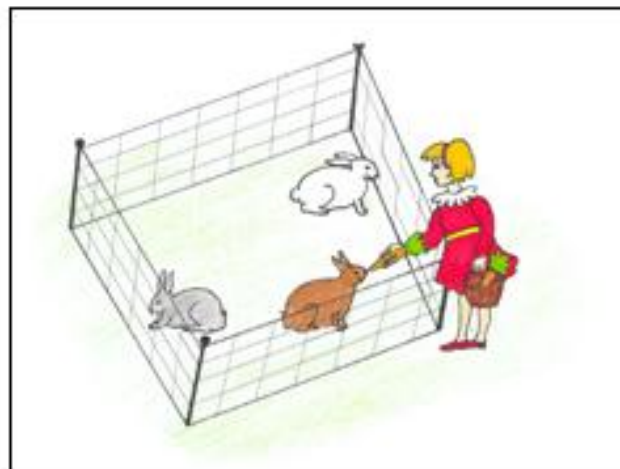
Ok, Drakie, kun je vertellen wat er met de boodschappen of de kinderen is gebeurd?

(27) Puppert HF (...OF...) → Child TVJ: *Ze heeft hen in de bakfiets gezet*

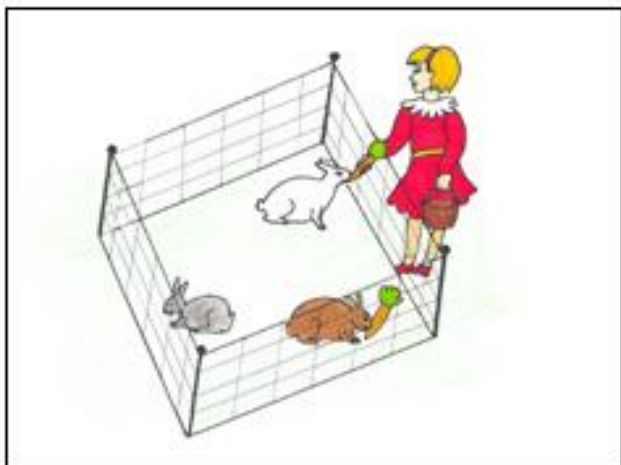
8.3.5 Filler items



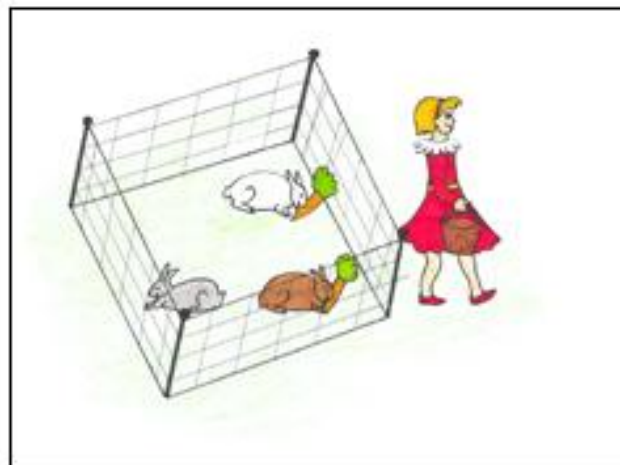
Dit is een meisje. En dit zijn konijnen. Die gaat ze denk ik voeren.



Hier voert ze een konijn.



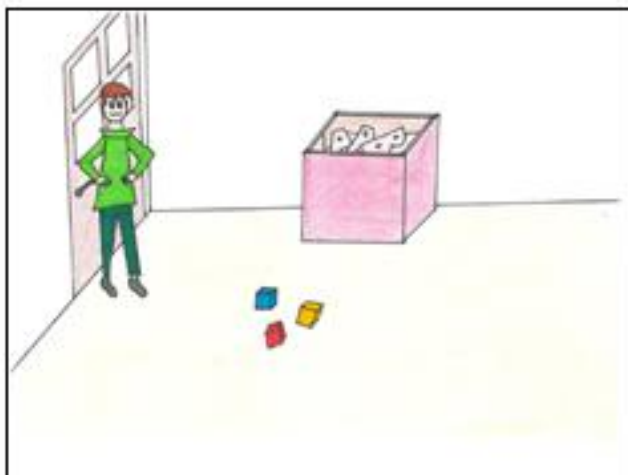
Hier voert ze een nog een konijn.



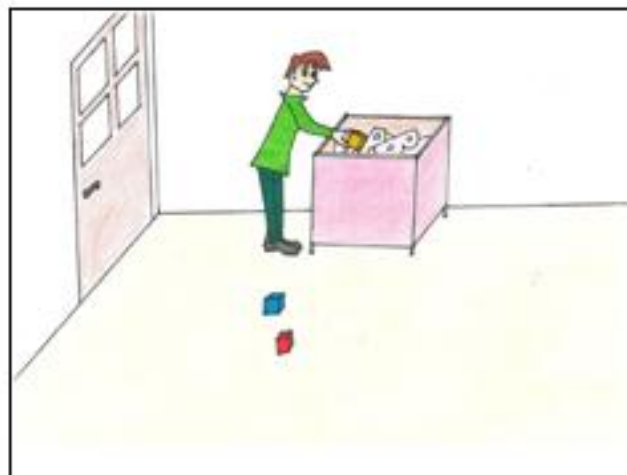
En nu gaat ze weer weg.

Ok, Drakie vertel ons eens iets over het verhaaltje

Puppet NEG → Child TVJ: *het meisje heeft een konijn niet gevoerd*



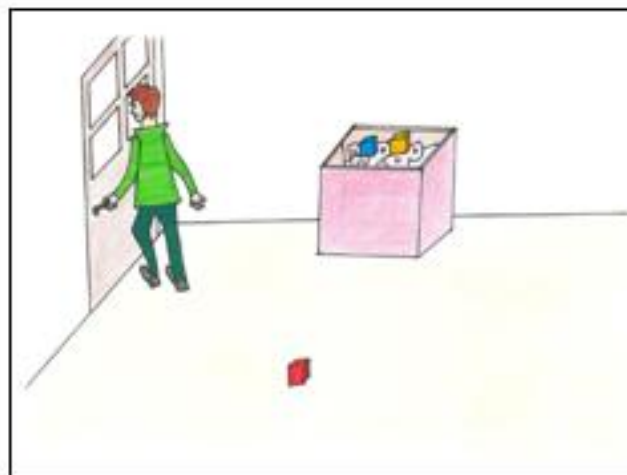
Dit is een jongen. En dit zijn blokken. Die gaat hij denk ik in de doos doen.



Hier doet hij een blok in de doos.

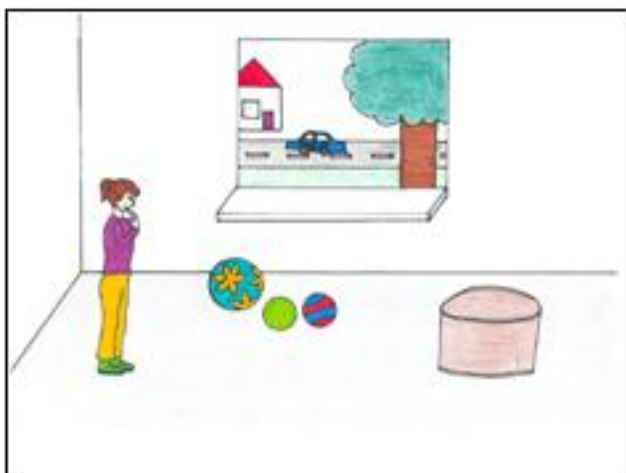


Hier doet hij nog een blok in de doos.

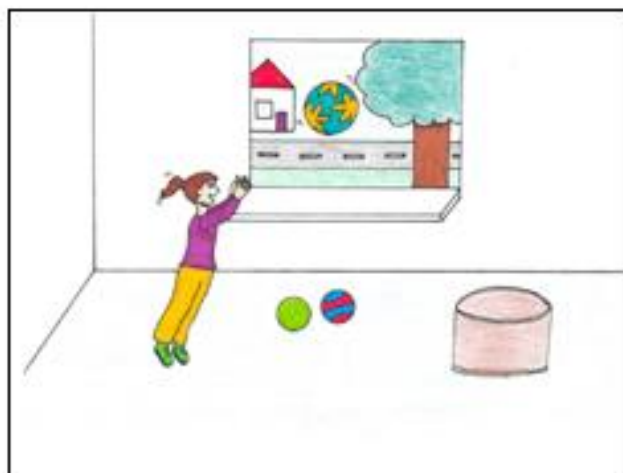


En nu gaat hij weer weg. Ok, Drakie vertel ons eens iets over het verhaaltje
Puppet F NEG → Child TVJ: *de blokjes hadden NIET verschillende kleuren.*

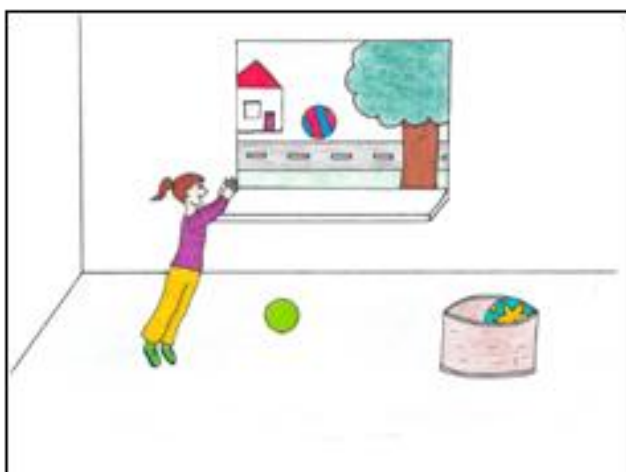
En zeg eens iets wat de jongen NIET gedaan heeft.
Puppet NEG → Child TVJ: *de jongen heeft een blok niet in de doos gedaan.*



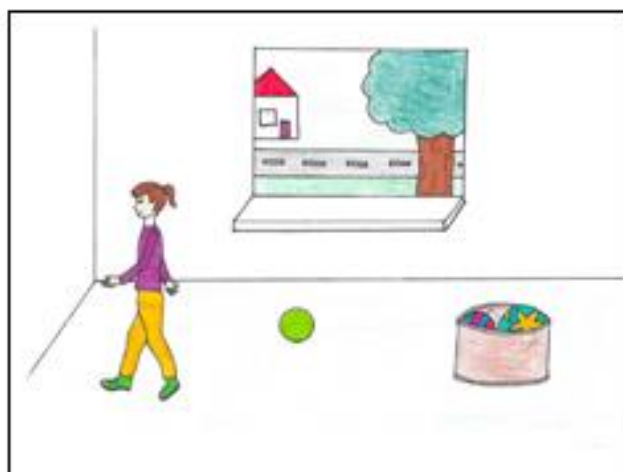
Dit is een meisje. En dit zijn ballen. Die gaat ze denken in de mand gooien.



Hier gooit ze een bal.

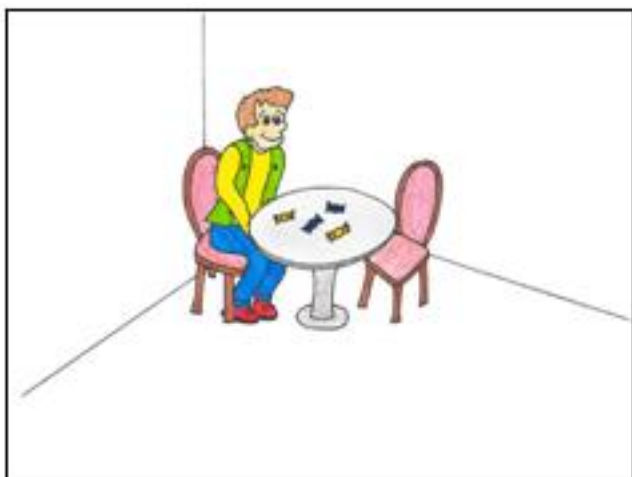


Kijk eens! Ze heeft raak gegooid. En hier gooit ze nog een bal.

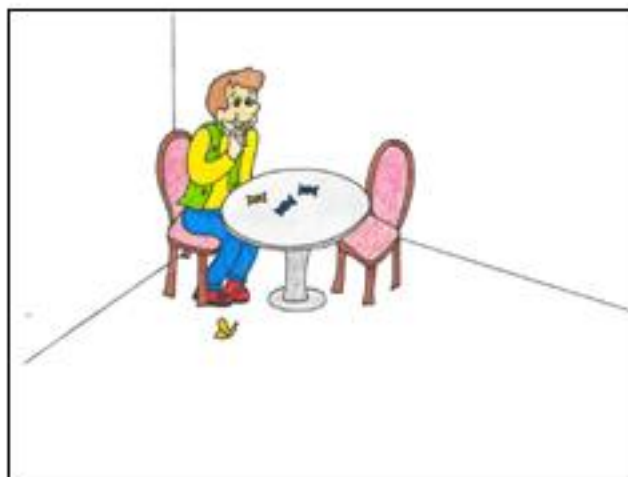


Die zit ook in de mand. En nu gaat ze weer weg. Ok, Drakie vertel ons eens iets over het verhaaltje
Puppet F → Child TVJ: *het meisje heeft de ballen tegen het dak gegooid*

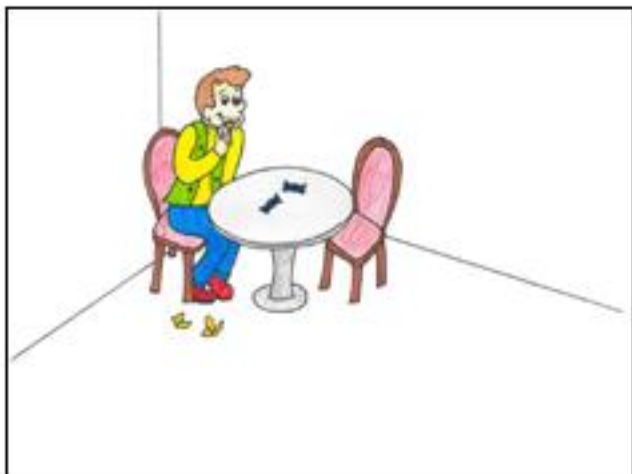
En zeg eens iets wat het meisje NIET gedaan heeft.
Puppet NEG → Child TVJ: *het meisje heeft een bal niet in de mand gegooid*



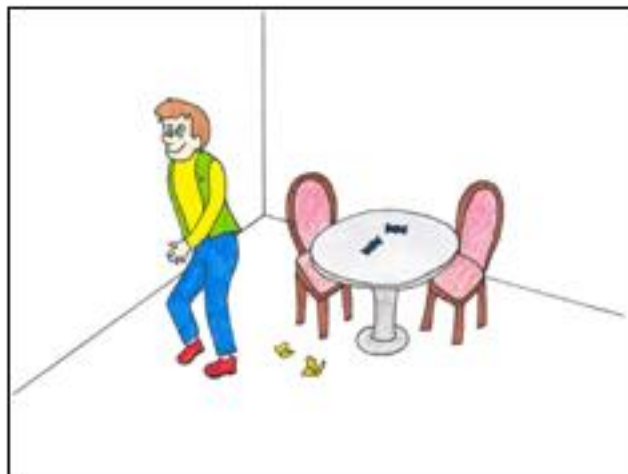
Dit is een jongen. En dit zijn snoepjes. Die gaat hij denk ik opeten.



Hier eet hij een snoepje. Hij gooit het papiertje gewoon op de grond. Dat mag niet he, die horen in de prullenbak, of in je broekzak.

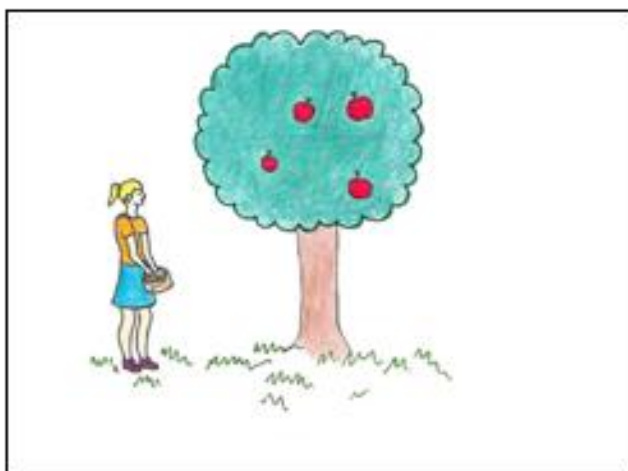


Hier eet hij nog een snoepje op. En weer gooit hij het papiertje op de grond.



En nu gaat hij weer weg. Ok, Drakie vertel ons eens iets over het verhaaltje
Puppet F → Child TVJ: *hij heeft de papiertjes in de prullenbak gedaan*

En zeg eens iets wat de jongen NIET gedaan heeft.
Puppet NEG → Child TVJ: *de jongen heeft een paar snoepjes NIET opgegeten.*



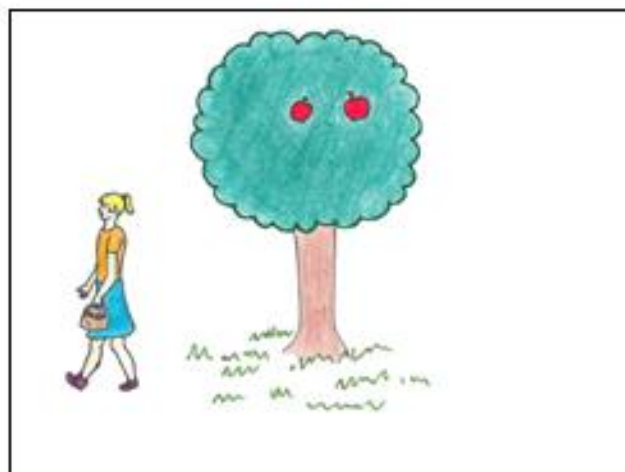
Dit is een meisje. En dit zijn appels. Die gaat ze denk ik plukken.



Hier plukt ze een appel.



Hier plukt ze nog een appel.

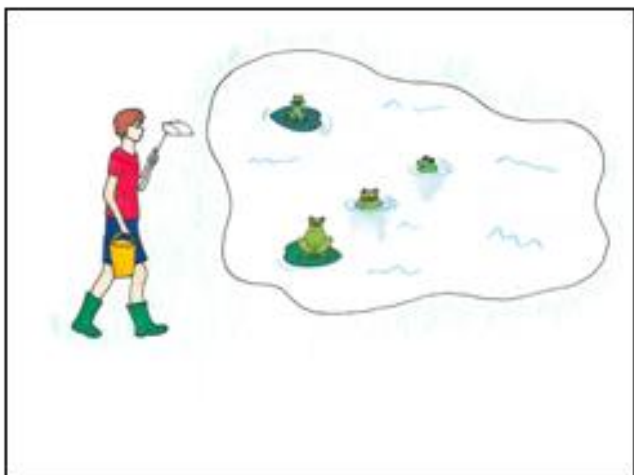


En nu gaat ze weer weg. Ok, Drakie vertel ons eens iets over het verhaaltje

Puppet T NEG → Child TVJ: *Het meisje heeft niet een rokje aan*

En zeg eens iets wat het meisje NIET gedaan heeft.

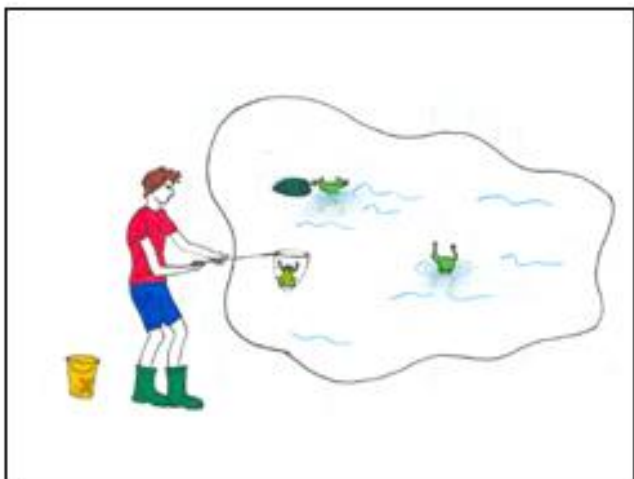
Puppet NEG → Child TVJ: *het meisje heeft een paar appels NIET geplukt*



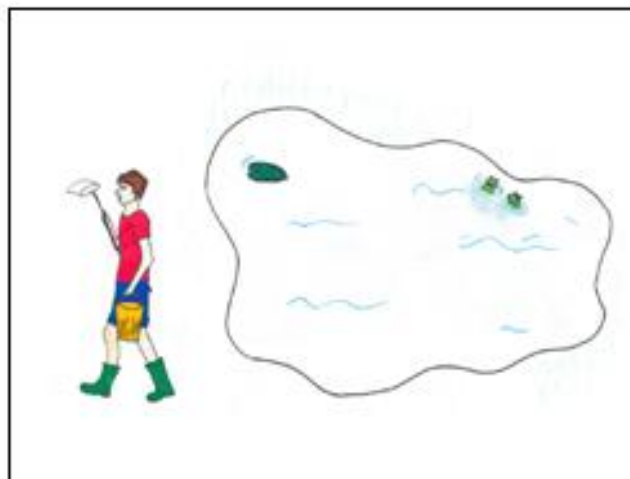
Dit is een jongen. En dit zijn kikkers. Die gaat hij denk ik vangen.



Hier vangt hij een kikker.



Hier vangt hij nog een kikker.

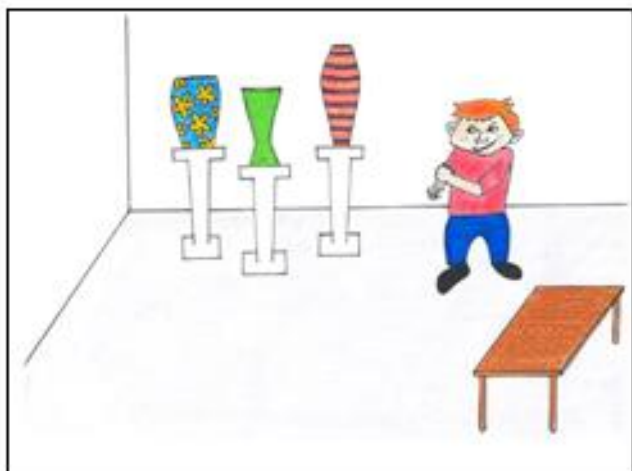


En nu gaat hij weer weg. Ok, Drakie vertel ons eens iets over het verhaaltje

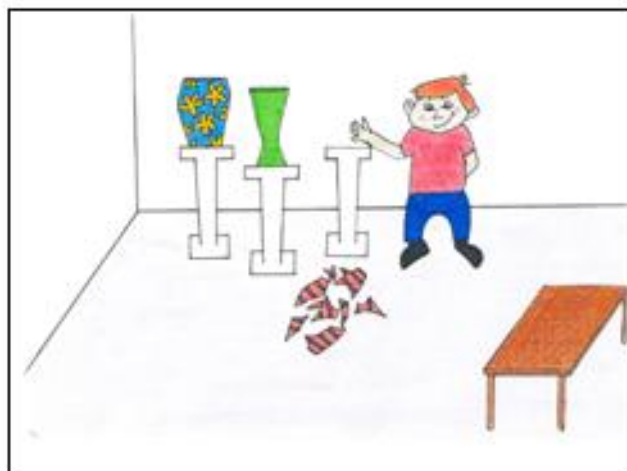
Puppet T → Child TVJ: *De jongen had een emmer meegenomen.*

En zeg eens iets wat de jongen NIET gedaan heeft.

Puppet NEG → Child TVJ: *de jongen heeft een paar kikkers NIET gevangen.*



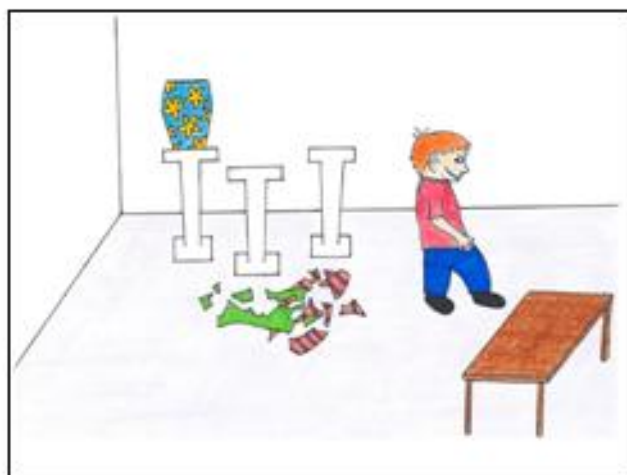
Dit is een jongen. En dit zijn vazen op drie paaltjes.
Die gaat hij denk ik kapot maken.



Hier breekt hij een vaas. O, dat mag helemaal niet.

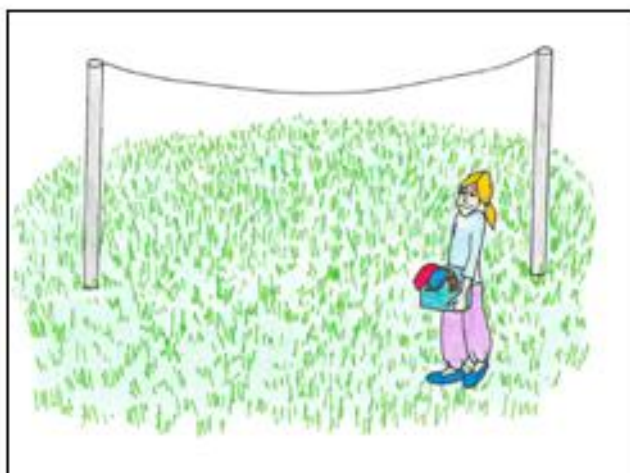


Hier breekt hij nog een vaas. Wat een stoute jongen!



En nu gaat hij weer weg. Hij krijgt vast nog straf! Ok,
Drakie vertel ons eens iets over het verhaaltje
Puppet T NEG → Child TVJ: *De vazen stonden niet
op het bruine tafeltje*

En zeg eens iets wat de jongen NIET gedaan heeft.
Puppet NEG → Child TVJ: *de jongen heeft één vaas
niet gebroken.*



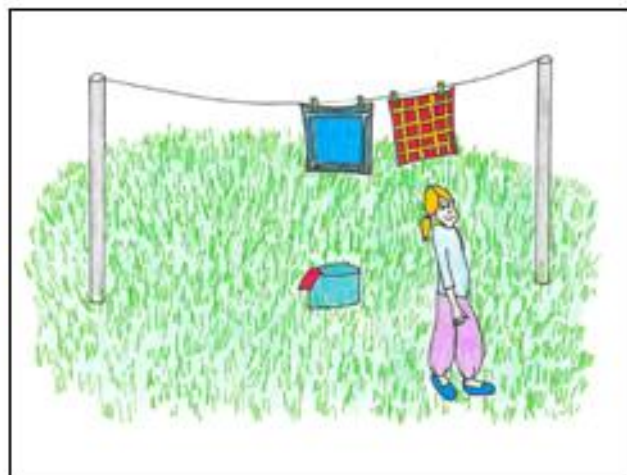
Dit is een meisje. En dit zijn theedoeken in een mandje. Die gaat ze denk ik ophangen.



Hier hangt ze een theedoek op.



Hier hangt ze nog een theedoek op.



En nu gaat ze weer weg. Ok, Drakie vertel ons eens iets over het verhaaltje

Puppet T → Child TVJ: *De theedoeken zaten in een mandje*

En zeg eens iets wat het meisje NIET gedaan heeft.

Puppet NEG → Child TVJ: *het meisje heeft één theedoek niet opgehangen*



Dit is een jongen. En dit zijn kuikentjes. Die gaat hij denk ik oppakken.



Hier pakt hij een kuikentje.



Hier pakt hij nog een kuikentje op.



En nu gaat hij weer weg. Ok, Drakie vertel ons eens iets over het verhaaltje

Puppet F NEG → Child TVJ: *De kuikentjes zaten niet op het gras*

En zeg eens iets wat de jongen NIET gedaan heeft.

Puppet NEG → Child TVJ: *de jongen heeft één kuikentje niet opgepakt*

8.3.6 Puppet answer sheet

| HEN/ÉÉN EXP: Versie A²⁷ | | | |
|---|--|--------|--------------|
| Name: | Date of birth:..... | Gender | M F |
| BLOK 1: EEN | | | |
| (1) TN1 | Het meisje heeft de konijntjes niet geaaid | T | F ??..... |
| (2) EE1 | Het meisje heeft een konijn niet gevoerd | T | F ??..... |
| (3) FN1 | De blokjes hadden niet verschillende kleuren | T | F ??..... |
| (4) EE2 | De jongen heeft een blok niet in de doos gedaan | T | F ??..... |
| (5) F1 | Het meisje heeft de ballen tegen het dak gegooid | T | F ??..... |
| (6) EE3 | Het meisje heeft een bal niet in de mand gegooid | T | F ??..... |
| ZE IS FOUT | | | |
| (7) T3 | Suzanne is jarig | T | F ??..... |
| (8) F3 | Suzanne heeft 4 zusjes | T | F ??..... |
| (9) T4 | Twee zuurtjes en een lollie | T | F ??..... |
| (10)ZF | Ze heeft <i>ze</i> in de mand gelegd | T | F ??..... |
| BLOK 2: ÉÉN | | | |
| (11)TN2 | De vazen stonden niet op het tafeltje | T | F ??..... |
| (12)ÉÉ1 | De jongen heeft één vaas niet gebroken | T | F ??..... |
| (13)T1 | De theedoeken zaten in een mandje | T | F ??..... |
| (14)ÉÉ2 | Het meisje heeft één theedoek niet opgehangen | T | F ??..... |
| (15)FN2 | De kuikentjes zaten niet op het gras | T | F ??..... |
| (16)ÉÉ3 | De jongen heeft één kuikentje niet opgepakt | T | F ??..... |
| ZE IS GOED/FOUT | | | |
| (17)T5 | Tom heeft 2 vrienden | T | F ??..... |
| (18)F4 | De honden zitten in de tent | T | F ??..... |
| (19)ZA | Hij heeft <i>ze</i> het huis ingestuurd | T | F ??..... |
| BLOK 3: EEN PAAR | | | |
| (20)F2 | Hij heeft de papiertjes in de prullenbak gedaan | F | ??..... |
| (21)EP1 | De jongen heeft een paar snoepjes niet opgegeten | T | F ??..... |
| (22)FN3 | Het meisje heeft niet een rokje aan | T | F ??..... |
| (23)EP2 | Het meisje heeft een paar appels niet geplukt | T | F ??..... |
| (24)T2 | De jongen had een emmer meegenomen | T | F ??..... |
| (25)EP3 | De jongen heeft een paar kikkers niet gevangen | T | F ??..... |
| HEN IS FOUT | | | |
| (26)T6 | De vrachtwagen is rood | T | F ??..... |
| (27)HF | Mama heeft <i>hen</i> in de bakfiets gezet | T | F ??..... |

²⁷ The other experiment that was included in this research required four different versions of the puppet answer sheet, for reasons of order. Because these four versions are not of importance to the experiment at hand, they are not included in this section.

8.3.7 Adult answer sheet

SCRIPTIE ONDERZOEK - 2012

Geboortedatum M/V

Geboortestreek

(plaats/streek waar je bent opgegroeid:, basisschool & middelbare school)

Huidige Woonplaats

Dialect-spreker JA/NEE

(Spreek je naast Standaard Nederlands regelmatig een dialect?)

*****Verhaal 1: Suzanne*****

Wat is er met de snoepjes of met de zusjes van Suzanne gebeurd?

Stelling 1

GOED

FOUT

.....

*****Verhaal 2: Tom*****

Wat is er met de honden of met de vrienden van Tom gebeurd?

Stelling 2

GOED

FOUT

.....

*****Verhaal 3: Boodschappen doen*****

Wat is er met de boodschappen of met de kinderen gebeurd?

Stelling 3

GOED

FOUT

.....