

Effects of age on the acquisition of agreement inflection

1. Introduction

It is often claimed that one of the conspicuous differences between child L1 and adult L2 acquisition is to be found in the domain of inflection. In fact, this idea is a corner stone in theories of language contact (Thomason and Kaufman 1988, Van Coetsem 1988). Put briefly, the assumption is that L2 learners may indirectly corrupt the inflectional system of a language due to their inability to acquire this system as easily as L1 learners seem to do. If the output of the L2 learners spreads over the population and if it is the input for new generations of L1 learners, loss of inflection will be the result.

This argumentation nicely shows the interaction of several linguistic (sub) disciplines. Accordingly, support for effects of age on the acquisition of inflection may come from studies on differences between pidginization and creolization, but also from dialect variation and language change. In this paper, however, we will focus on the issue of age effects directly, by comparing adult and child learners in the acquisition of Dutch agreement inflection. Vice versa, our paper may indirectly contribute to insights in language contact, variation and change, although we will not be concerned with these consequences here in detail.

A comparison between adult and child learners can be made in several ways. Age effects may show up in the type of errors the learners make, in that children may make different mistakes than adults do. We may also see differences in the developmental paths of the learners or in the ultimate attainment. L2 learners may go through different stages and may finally reach a level that is quite different from L1 learners. Clearly these three aspects (type of errors, development and ultimate

attainment) are related and they are all relevant for the present discussion. Due to the experimental set up we will focus here on the type of errors the learners make.

Of course, differences between child L1 and adult L2 learners do not point directly to age effects. For one thing, the language of the L2 learners might be influenced by their L1. In order not to confuse age effects with effects from transfer, we will compare monolingual L1 learners not only with adult L2 learners, but also with child L2 learners with the same language background as the adults. If the claims made in contact studies are correct – that is, if there are indeed age effects in the acquisition on inflection – we expect to see differences between L1 and child L2 acquisition on the one hand and adult L2 acquisition on the other. We will show that such differences indeed exist.

In principle, several explanations can be given for this state of affairs. It might, for instance, be due to a difference in the input or to the way in which learners do or do not receive explicit instructions. We will argue, however, that the distinctions we find reflect differences in adult and child representations of inflection, more specifically, the occurrence of underspecified suffixes in the adult paradigm that are not underspecified in the child paradigm. It will be hypothesized that the observed differences in inflection between children and adults are the effect of a learner's ability to make use of syntactic cues: children are highly sensitive to positional evidence and use this for building paradigms, whereas adults fail to use this information.

The structure of this paper is as follows. Section 2 introduces the hypothesis, section 3 describes how we put this hypothesis to the test and spells out predictions. In sections 4 and 5, the results of experiments on respectively verbal and adjectival inflection will be discussed. Section 6 contains the concluding remarks.

2. Age effects: the case of inflection

There are indications that inflection is vulnerable in late L2 acquisition. The influential study of Johnson and Newport (1989, 1991) shows that late learners of English fail to judge correct use of 3rd person singular *-s*. McDonald (2000), in partial replication of Johnson and Newport's work, reports a similar result. Analyses of naturalistic production data confirm the observation that agreement inflection is influenced by the age at which first systematic exposure to a language starts (Lardiere, 1998; Prévost and White, 2000). Is this vulnerability limited to agreement inflection, or does it apply to inflection in general? A comparison of different types of inflection - tense, aspect, nominal - indicates that the problems of adult learners go beyond the particular case of agreement inflection (Johnson and Newport, 1989; McDonald, 2000; Lardiere, 1998).

The obvious question that follows is: why are children good at learning inflection, and why is inflection difficult for adults? In the literature, only few explicit attempts can be found to explain this difference between children and adults in the acquisition of inflection. Goldowsky and Newport (1993) propose the Less-is-More hypothesis, attributing children's benefits to their small working memory (see also Elman, 1993). McDonald (2000) relates non-native accuracy of (child and adult) L2 learners to problems with phonological decoding, which may be more likely to affect inflectional morphology than syntax proper. Both Goldowsky and Newport and McDonald explain the observed linguistic differences in terms of memory size and processing capacity, and hence, propose a non-linguistic explanation. Franceschina and Hawkins (2004), also: Tsimpli (2003), take a different lead and argue that access to uninterpretable grammatical features (read: UG) is maturationally constrained. In

other words, they argue that it is the a priori knowledge of language that draws the line between children and adults.

The most explicit proposal on errors with inflection and age-related differences therein can be found in studies defending the Missing Surface Inflection Hypothesis or MSIH (Haznedar and Schwartz, 1997; Lardiere, 1998; Prévost and White, 2000; Prévost, 2003). Prévost and White formulate the basic idea of the MSIH as follows (Prévost and White, 2000:103): “L2 learners have unconscious knowledge of functional projections and features including tense and agreement, but have problems with realization of the correct surface morphology.” Building on the framework of Distributed Morphology (Halle and Marantz, 1993; Harley and Noyer, 1999) and the idea that morphology is separated from syntax (and semantics) (Beard, 1982; 1995), MSIH studies claim that learners insert underspecified suffixes in fully specified syntactic structures. In this way, overuse of bare verbs has been analyzed as insertion of an underspecified form (Haznedar and Schwartz, 1997; Lardiere, 1998; Prévost and White, 2000; Prévost, 2003). As for the reason behind insertion of underspecified vocabulary items, opinions differ: it has been suggested that processing demands play a role (Lardiere, 1998), or influence of L1 prosody (Goad, White and Steele, 2003).

The MSIH studies have focussed primarily on omission of (finite) inflection, but Prévost and White (2000) and Prévost (2003) also discuss incorrect inflection, and differences between child and adult learners in this respect. Prévost and White explain the overuse of the suffix *-en* in finite position by adult L2 learners of German; their reasoning is as follows: children specify infinitival *-en* as [-finite] and the suffixes in finite position as [+finite] (plus some additional phi features); adult L2 learners have the same syntax as the children, but differ crucially in that they underspecify the

infinitival suffix *-en* [αfinite]. In the spirit of this work, we hypothesize that both children and adults make use of underspecified inflectional suffixes. However, children and adults have different underspecified suffixes, causing different types of errors in the two learner groups.

Unlike Prévost and White, we argue that the inflectional errors of adults go hand-in-hand with syntactic “deficits”. In the literature, it has been argued that adult knowledge and/or processing of L2 syntax differs from native knowledge/processing. This difference may be due to effects of transfer of L1 syntax (Schwartz and Sprouse, 1996), effects of L1 prosody in processing L2 syntax (Steinhauer, Alter and Friederici, 1999) or because nonnative comprehenders *underuse* syntactic information in L2 processing (Felser, Roberts, Marinis and Gross, 2003; Marinis, Roberts, Felser & Clahsen, 2005). In the particular case of the child and adult learners who participated in our experiments, previous analyses indicate that accuracy in the verb placement test indeed correlates with accuracy in the verbal inflection tests. For the children (L1 and L2) this correlation shows in high accuracy in both tests; the reverse holds for the adults (Blom and Polišenská, in press; Blom, 2005).¹

Our hypothesis is that the observed difficulties in the domain of syntax have repercussions for learning inflectional paradigms. Whereas for children syntax is a reliable cue for specifying inflectional suffixes, syntax does not have this function for adults. For instance, if the same inflectional suffix appears in different positions, children’s use of positional information may result in two different suffixes, whereas the adult ignorance of positional - local – cues leads to one underspecified suffix. Speculating on the effects of this difference in learning strategy, we may hypothesize that local vs. global processing of the input has an effect on frequency. Suppose that

¹ These are group results. There are, however, indications that analyses of individual data within the adult sample confirm that higher accuracy in the verb placement test correlates with higher accuracy in the verbal inflection tests.

the hypothetical suffix *-io* occurs in different positions; for adult learners the frequency of *-io* would be the sum of all occurrences of *-io*, irrespective of position. For children, being very sensitive to syntactic information, frequency of *-io* is not simply the sum of all occurrences of *-io*, since they evaluate *-io* relative to its syntactic position.

3. Operationalization and predictions

Our focus is on verbal and adjectival inflection: we will investigate agreement between subject and verb (IP) and agreement between determiner, adjective and noun (DP). Before we turn to the specific predictions, we describe the properties of verbal and adjectival inflection in Dutch.

Dutch finite verbs encode person and number. The present tense indicative paradigm distinguishes stems with three different suffixes: \emptyset is used for first person singular; *-t* for the second and the third person singular and *-en* for plural forms irrespective of person.² There are in Dutch only few verbs with an irregular inflectional paradigm (mainly modals). Note that in standard Dutch declarative main clauses, the finite verb moves to second position where it precedes the object, negation, particles, etc. In contrast, the Dutch infinitive remains in final base position. The infinitival verb is morphologically similar to finite plural verbs and is marked with the suffix *-en*. The finite verbal paradigm is illustrated in table 1; example (1) gives a declarative sentence with a finite main verb, (2) illustrates a declarative sentence with a periphrastic verb consisting of a finite modal auxiliary and an infinitival main verb.

² If the finite verb follows the subject (inversion), second person singular is syncretic with first person singular and has no overt inflection (*Nu loop jij weg* ‘now walk you away’). We have tested verbal inflection in inversion contexts as well, but we have excluded these results from the data presented here.

Table 1: Dutch finite verbal paradigm for regular verbs in present indicative

| Person and number | Inflection | Example (<i>lopen</i> ‘to walk’) | |
|-------------------|------------|-----------------------------------|--------------------|
| 1SG | Stem + Ø | <i>Ik loop</i> | ‘I walk’ |
| 2SG | Stem + t | <i>Jij loopt</i> | ‘You walk’ |
| 3SG | Stem + t | <i>Hij loopt</i> | ‘He walks’ |
| 1-3PL | Stem + en | <i>Wij/jullie/ zij lopen</i> | ‘We/you/they walk’ |

(1) *Wij lopen langs de Lijnbaan*

we walk-1SG-PL over the Lijnbaan

(2) *Wij moeten langs de Lijnbaan lopen*

we must over the Lijnbaan walk-INF

With respect to adjectival inflection, Dutch makes a syntactic distinction between predicative and attributive adjectives. Predicative adjectives are not overtly marked by a suffix. As a consequence a predicative adjective stays uninflected and always occurs without schwa as illustrated in (3). (4) shows that in attributive position, the adjective is inflected with a schwa.

(3) *De bloem ruikt lekker/*lekkere*

The flower smells nice

(4) *De *lekker/lekkere bloem*

The nice flower

In contrast to predicatives, Dutch attributive adjectives are overtly inflected. The rule is: always add a schwa (-e) to an adjective except if the noun is singular and neuter and the determiner is indefinite. Absence of inflection is a special case, in which the bare adjective (- \emptyset) must be used. Table 2 gives an overview of attributive adjectival inflection system in Dutch.

Table 2: Attributive adjectival inflection in Dutch

| Context | Suffix | Example | |
|-----------------|---------------|------------------------|-------------------|
| DEF, NEUT, SG | -e | <i>Het mooie huis</i> | ‘The nice house’ |
| INDEF, NEUT, SG | - \emptyset | <i>Een mooi huis</i> | ‘A nice house’ |
| DEF, COM, SG | -e | <i>De mooie auto</i> | ‘The nice car’ |
| INDEF, COM, SG | -e | <i>Een mooie auto</i> | ‘A nice car’ |
| DEF, NEUT, PL | -e | <i>De mooie huizen</i> | ‘The nice houses’ |
| INDEF, NEUT, PL | -e | <i>Mooie huizen</i> | ‘Nice houses’ |
| DEF, COM, PL | -e | <i>De mooie autos</i> | ‘The nice cars’ |
| INDEF, COM, PL | -e | <i>Mooie autos</i> | ‘Nice cars’ |

Tables 1 and 2 give a description of the contrasts found in the finite verbal paradigm and the attributive adjectival paradigm in Dutch. Following the assumptions of Distributed Morphology, we assume that the suffixes in Tables 1 and 2 are represented in the vocabulary as a list of vocabulary items i.e combinations of a phonological string (left hand side of the arrow) and morpho-syntactic information about the position of this string (right hand side of the arrow). The vocabulary items are ordered following the principle of decreasing specificity, with the most specific vocabulary item in topmost position, and the least specified vocabulary item at the bottom. The systems of verbal and adjectival inflection can now be accounted for by the lists of vocabulary items in (5); [\pm fin] stands for ‘finiteness’, [\pm sp] ‘speaker’, [\pm

plur] for ‘number’, [\pm neut] for ‘gender’, [\pm def] for ‘definiteness’ and [\pm attr] for ‘attributive’:

| | | |
|-----|---------------------------------|--------------------------------------|
| (5) | a. Target paradigm verbs | b. Target paradigm adjectives |
| | /t/ ↔ [+fin, -sp] | /ø/ ↔ [+attr, -def, +neut, -plur] |
| | /en/ ↔ [+fin, +plur] | /e/ ↔ [+attr] |
| | /ø/ ↔ [+fin] | /ø/ ↔ [-attr] |
| | /en/ ↔ [-fin] | |

Insertion of vocabulary items is post-syntactic and is the result of the interplay between the Subset Principle (“the features of the inserted vocabulary item must be equal to or a subset of the features in the syntactic slot”; Halle, 1997) and the Elsewhere Principle (“a more specified vocabulary item has precedence over an underspecified vocabulary item”; Kiparsky, 1973). Amongst other things, interaction of the Subset Principle and the Elsewhere Principle prevents insertion of the bare stem if the subject is a non-speaker, or insertion of the schwa suffix if the noun is singular and neuter and the determiner indefinite.

During the acquisition process underspecified vocabulary items may occur in non-target contexts. Under the assumption that acquisition proceeds through an incremental specification metric, according to which only one feature is added at a time (Pinker, 1986; Blom and Don, 2005; Adger, 2005), underspecified vocabulary items will be acquired before specified vocabulary items. Underspecified vocabulary items will be temporarily overused, i.e. inserted in non-targetlike syntactic positions, namely as long as specified vocabulary items are not acquired. It may also be the case that there are stages in which learners have a paradigm that is not only shorter than the

paradigms in (5) but is also deviant, i.e. qualitatively different: learners may have assigned morpho-syntactic features to a phonological string that differ from the feature specification in the target system. In line with Prévost and White (2000) and Prévost (2003), we hypothesize that this is the case for adult learners. Adults may pick up a phonological string, but fail to pick up the morpho-syntactic information belonging to this string. This leads, in turn, to storage of underspecified vocabulary items. Children, in contrast, are particularly good in using positional information.

This scenario makes particular predictions with regard to errors. In both the domain of verbal and adjectival inflection, there are potential candidates for differences between child and adult acquisition. In the verbal paradigm, finite plural *-en* is homophonous with the infinitive. In the adjectival paradigm, the bare adjective appears both in attributive positions in contexts that are indefinite, neuter and singular and in predicative position. The prediction thus is that both suffixes (verbal *-en* and adjectival *-ø*) are represented in the adult L2 vocabulary as underspecified items, whereas they are specified in the child vocabulary. Whereas child vocabulary is expected to be in principle targetlike - the most specific vocabulary items of the lists in (5a) and (5b) may in the early stages not yet be acquired - we expect that the adult representations are deviant. Focussing on verbal *-en* and adjectival *-ø*, they may look as in (6) below:

| | | |
|-----|-----------------------------------|--|
| (6) | a. Adult L2 paradigm verbs | b. Adult L2 paradigm adjectives |
| | /t/ ↔ [+fin, -sp] | /e/ ↔ [+attr] |
| | /ø/ ↔ [+fin] | /ø/ ↔ [αattr] |
| | /en/ ↔ [αfin] | |

What does this predict? Following the “child L2 rationale” (Schwartz, 1992, 2003; Unsworth, 2005), we compare child L1, child L2 and adult L2 learners of Dutch, holding the L1 of the L2 learners constant. If there is L1 transfer, it should be found in child L2 and adult L2 groups. We select L2 participants from two different L1 backgrounds for more information on possible effects of transfer. In case of transfer, we may also expect differences between the L2 learners that differ in L1. Turning to effects of age, we expect that the child L2 learners behave like the child L1 learners and unlike the adult L2 learners. More specifically, we expect that the adult L2 learners (i) erroneously use *-en* in contexts that require a verb ending on *-t* or a zero suffix (i.e. finite singular contexts), and (ii) insert the zero suffix in contexts that require an adjective ending on a schwa (i.e. all definite contexts, plural contexts and contexts with a non-neuter noun). In contrast, we do not expect such errors in both the child groups: if the children make use of the syntactic distinction between the finite *en* non-finite suffix *-en* and between attributive and predicative $-\emptyset$, it is not expected that verbal *-en* and adjectival $-\emptyset$ end up as default suffixes, and will, as such, be inserted in non-targetlike contexts. In order to investigate this claim, we compare the learner groups on the basis of types of errors.

4. Participants

The (cross-sectional) L1 data are taken from Polišenská (2005), who tested monolinguals between 3 and 6 with an experimental design that is highly similar to the design described in sections 5.1. and 6.1.. Polišenská’s subjects were attending regular elementary schools or day-care, in predominantly Dutch monolingual surroundings and were reported by their teachers to be developing language normally. L2 participants are selected from the two largest immigrant populations in the

Netherlands: Turks and Moroccans (mainly Berbers that speak Tarifit). The adults received no Dutch input before puberty. The children were born in the Netherlands, but had hardly any Dutch input before the age of four i.e. when they start to attend elementary school. At this age, i.e. when systematic exposure to Dutch starts, it can be assumed that the children master the basic properties of their L1 grammar (i.e. Turkish and Moroccan Arabic/Tarifit).³ Table 3 gives an overview:

Table 3: Participant overview and proficiency scores

| Sample | Proficiency Level (range) | Age of Arrival | Starting Age | Testing Age | Instructed learning | N |
|----------------------|---------------------------|----------------|--------------|-------------|---------------------|----|
| Child L1 (n = 31) | not tested | 0 | 0 | 3-6 | not relevant | 31 |
| Child L2 (n = 31) | Low (0-15) | 0 | 4 | 5 | 12 mos | 2 |
| | Moderate (16-25) | 0 | 4 | 5-7 | 24-36 mos | 15 |
| | High (26-40) | 0 | 4 | 5-8 | 24-36 mos | 14 |
| Adult (n = 18) | Low (0-15) | 21-39 | >15 | 22-58 | 12-36 mos | 9 |
| | Moderate (16-25) | 23-31 | >15 | 24-35 | 12-24 mos | 7 |
| | High (26-40) | 16-24 | >15 | 25-32 | 12-36 mos | 2 |

All participants get instructions on Dutch, either at elementary school (children) or at specific courses (adults). To test the level of Dutch proficiency, each subject participated in a sentence-repetition task (Verhoeven et al, 1986, 2002).⁴ As there are

³ Inquiries have been made with the teacher(s), who, in turn, consulted the parents of the children in case of uncertainty. For the inquiries we used a questionnaire. The criterion for inclusion is that the parents did/do not speak Dutch to the child, so that the home-situation is clearly pre-dominant monolingual Turkish or Moroccan Arabic/Tarifit. If the children heard Dutch at home, this was via siblings and/or television. In our task, we did not find any significant differences between oldest children and children with older siblings (and who may have heard Dutch at home from their siblings). Moroccan Arabic and Tarifit have been collapsed because often the parents speak both languages, and with respect to the linguistic variables in our study, the two languages do not differ.

⁴ Each test sentence contains a word order property of Dutch and a function word. If both were repeated correctly, the sentence received two points. If only one of the two was repeated correctly, one point was assigned per sentence, etc. The maximum score is 40 points (20 sentences). In the child

still too little data per proficiency level for valid comparisons, we collapsed the results from different levels.⁵ All samples contain Turks and Moroccans, except for adult L2 learners with a high level of Dutch proficiency; this sample is restricted to Turkish participants.

5. Finite verbal inflection

5.1. Method

All participants have been tested with a sentence-completion task and a description task. The sentence completion task provided data on 3SG and 3PL contexts in declarative main clauses. In this task subjects had to describe a contrast between two pictures that represent (a) character(s) that perform(s) an activity (see example 7). In order to distinguish between finite and non-finite verbs, combinations of object and verb have been elicited. The experimenter triggered the sentence by pronouncing the underlined words and the task of the subject was to complete the sentence (the correct subject responses are in bold).

- (7) Deze man **leest een boek** en die man **leest een krant**
This man read-fin a book and that man read-fin a newspaper
‘This man is reading a book and that man is reading a newspaper’

To obtain responses on 1SG, 2SG and 1PL we designed a task in a form of a game in which the experimenter as well as the subject had to pick up a card (from a strictly

sample, results of the proficiency test strongly correlate with length/intensity of systematic exposure to Dutch ($r = 0.632$; Pearson correlation). In the adult sample, estimation of length/intensity of systematic exposure to Dutch is difficult. An accuracy analysis of verb placement indicates that higher levels of proficiency correlate with higher accuracy, suggesting that the proficiency measure gives a reliable estimate for the adults as well.

⁵ Overall, the children represent a higher proficiency level than the adults. Consequently, qualitative analyses of errors may be more telling than comparisons of the amounts of errors. Also, effects of L1 transfer may be more present in the adult sample than in the child sample.

final position, are non-finite and should therefore not be confused with instances of incorrect finite inflection and counted as such (a.o. Jordens, 1990; Poeppel and Wexler, 1993; Prévost, 2003). For this reason, we only included responses in the main clause condition and left out those responses in this condition in which a verb ending on *-en* followed the object, or in which a response was ambiguous between a finite sentence and a root infinitive (if there is no object expressed).⁶ Secondly, so called dummy auxiliaries, i.e. periphrastic verbs that consisted of auxiliary + infinitive to denote ongoing actions, have been excluded. (Jordens, 1990; Hollebrandse and Roeper, 1996; Van Kampen, 1997; Zuckerman, 2001). The counts have been restricted to lexical main verbs, because finite auxiliaries are highly frequent verbs and may as such be stored as unanalyzed vocabulary items.

Table 4 gives the overall accuracy, i.e. percentage of correct responses, for each experimental group:

Table 4: Accuracy verbal inflection (existing verbs)

| Group | N | % correct |
|-------------------|----------|------------------|
| Child L1 | 406 | 100 |
| Child L2 Turkish | 222 | 92 |
| Child L2 Moroccan | 416 | 90 |
| Adult L2 Turkish | 166 | 57 |
| Adult L2 Moroccan | 396 | 57 |

The difference between the child L1 and child L2 samples is not statistically significant. High accuracy in the child groups reflects productivity of rules: nonsense verbs are correctly inflected in respectively child L1: 93% (n=256), child L2T: 78%

⁶ Position not used as a criterion in embedded clause condition, and the inversion condition elicited no object, apart from some spontaneous realizations of objects.

(n=67) and child L2M: 82% (n=127) of the cases. The difference between the child L2 and adult L2 sample is statistically significant ($\chi^2(1) = 27.06$; $p < 0.001$).

Recall that we predicted that the adults substitute *-en* in finite position, and that this is an error that child learners do not make. Table 5 gives the probability that either *-ø*, *-t* or *-en* is used as a substitute:

Table 5: Probabilities of substitution of suffixes *-en*, *-t* and *-ø* (excl. root infinitives)

| Substitute | -ø | -t | -en |
|-----------------------|-------------------|----------------|--------------|
| Context | 2/3 SG, PL | 1SG, PL | SG |
| Child L1 ⁷ | 2 % n = 239 | 3,5 % n = 175 | 0 % n = 262 |
| Child L2 Turkish | 6 % n = 194 | 4 % n = 116 | 0 % n = 134 |
| Child L2 Moroccan | 5 % n = 368 | 9 % n = 192 | 2 % n = 272 |
| Adult L2 Turkish | 32 % n = 136 | 8 % n = 83 | 19 % n = 113 |
| Adult L2 Moroccan | 24 % n = 335 | 8 % n = 188 | 28 % n = 275 |

Given the Dutch paradigm, a learner can substitute the suffix *-ø* in 2SG, 3SG, 1PL and 3PL contexts, substitute the suffix *-t* in 1SG, 1PL and 3PL contexts and/or substitute the suffix *-en* in 1SG, 2SG and 3SG contexts. In the experiment, the conditions in which *-ø*, *-t* and *-en* can be substituted are not equally distributed. To compare the three suffixes, we calculated the number of conditions in which this suffix is substituted as a proportion of the number of conditions in which this suffix can be substituted. A comparison of the obtained proportions tells us which suffix(es) is (are) most frequently used as substitute(s). Table 5 shows that the adults, unlike the children, use *-en* as a finite substitute. A comparison of Tables 5, which excludes root infinitives, and 6, which includes root infinitives, reveals an asymmetry between

⁷ The scores of child L1 are only from the 3-5 years old population. The 6-year-old group reached ceiling levels for verbal inflection and was therefore not included in the error-analysis.

children's use of *-en* as a substitute in finite and non-finite, i.e. sentence-final, position. Like the adult learners, children do overuse the suffix *-en*, but unlike adults, they do not use *-en* as a finite substitute.

Table 6: Probabilities of substitution of suffixes *-en*, *-t* and *-ø* (incl. root infinitives)

| Substitute | -ø | -t | -en |
|-------------------|------------|------------|------------|
| Context | 2/3 SG, PL | 1SG, PL | SG |
| Child L1 | 2 % n=239 | 3,5% n=175 | 5 % n=275 |
| Child L2 Turkish | 6 % n=271 | 3 % n=172 | 17 % n=211 |
| Child L2 Moroccan | 5% n=548 | 8% n=286 | 11 % n=396 |
| Adult L2 Turkish | 18 % n=360 | 4 % n=161 | 57 % n=305 |
| Adult L2 Moroccan | 22 % n=479 | 6 % n=232 | 40 % n=405 |

5.3. Interpretation of results

In earlier work, we have shown that the adult learners in our sample have rather poor knowledge of the Dutch verb placement system, in contrast to the child learners (Blom and Poliřenská, to appear; Blom, 2005). We hypothesized that difficulties in the domain of syntax cause the acquisition of non-targetlike underspecified inflection by adult learners. More specifically, for the adults, and not for the children, *-en* is an underspecified vocabulary item. Children distinguish between finite *-en* and non-finite *-en*. If this is the case, it is expected that overuse of *-en* in finite contexts is restricted to the adult samples. This prediction is borne out: incorrect use of *-en* in the child sample, is restricted to non-finite position, whilst adults substitute *-en* in finite position.

To what extent does transfer influence our results? First of all, there are no similarities between child and adult L2 learners with the same L1: the Turkish child L2 learners pattern like the L1 learners, and not like the Turkish adult L2 learners.

The same holds for the Moroccan child and adult learners. From this, we conclude that effects of L1 transfer in the domain of inflectional morphology - if they are present at all - must be restricted to the adult sample. With respect to word order in a Turkish-English (sequential) bilingual child, Haznedar (1997) found L1 transfer in the first three months of L2 acquisition. Thus, we cannot conclude that there is no L1 transfer stage in child L2 acquisition of inflection, since it may be that our sample represents a developmental stage in which there is no transfer *anymore*.

So, L1 transfer does not draw the line between patterns in L1 and L2 acquisition in our sample. Does L1 transfer in the adult sample explain differences between patterns in child and adult acquisition of inflectional morphology? If this were the case, significant differences between the adult learners with a different L1 would have been expected. Since no such difference exists, we conclude that L1 transfer does not account for the difference between child and adult acquisition of inflection, and that the age of start of systematic exposure to Dutch plays a crucial role.

One could conjecture against this conclusion that the adults in our collapsed sample have in general a lower level of proficiency than the children, and hence, that the adults represent an earlier developmental stage. Does the lower level of proficiency of the adults explain observed differences between children and adults? There are two reasons for us to believe that this is not the case. First, our results are not influenced if we apply our proficiency measure (see section 4) and keep level of proficiency constant. Table 7 shows that adults with moderate proficiency substitute more often than children with moderate proficiency, and they use a different substitute in finite position, namely *-en*.

Table 7: Substitutions of *-en*, *-t* and *-ø*, moderate proficiency (excl. root infinitives)

| Substitute | -ø | -t | -en |
|-----------------|--------------|-------------|--------------|
| Context | 2/3 SG, PL | 1SG, PL | SG |
| Child L2 T n=5 | 10 % n = 84 | 4 % n = 51 | 0 % n = 49 |
| Child L2 M n=10 | 6 % n = 179 | 11 % n = 92 | 3 % n = 115 |
| Adult L2 T n=2 | 16 % n = 44 | 14 % n = 29 | 27 % n = 37 |
| Adult L2 M n=5 | 23 % n = 186 | 6 % n = 95 | 16 % n = 141 |

Suppose that for some reason our proficiency measure does not work and that the adult responses correlate to a child developmental stage that we have missed, i.e. an early child stage. The question then is: is there a child developmental stage that is characterized by *-en* substitutions? Analyses of naturalistic data in L1 Dutch, that go as early as the two-word-stage, indicate that there is no L1 stage in which children use *-en* as a finite default (De Haan, 1996; Blom, 2003; Blom and Polišenská, in press).

In sum, two alternative hypotheses to explain the observed difference between children and adults, i.e. differences in the effect of L1 transfer and differences in level of proficiency, do not account for the observation that adults, unlike the children, substitute *-en* in finite position. Instead, the hypothesis that children and adults differ in morpho-syntactic specification of *-en*, does explain this observation.

6. Attributive adjectival inflection

We hypothesized that adult learners underspecify the adjectival zero-suffix, which is expected to cause zero substitutions in attributive position. Children, in contrast, distinguish between predicative adjectives and attributive adjectives. For them, occurrence of the bare adjective in predicative and attributive position is accidental homophony; the two similar phonological strings correspond to respectively the

feature matrices [-attr] and [+attr, -def, +neut, -plur]. As a consequence, we do not expect zero-substitutions in attributive position in the child sample.

6.1. Method

The experimental set-up has been restricted to the testing of attributive adjectival inflection. Weerman et al. (2003) conducted a comparative pilot study, which investigates the Dutch adjectival inflection in child L1, child L2 and adult L2 learners, including use of predicative adjectives. Results from this study show a confident conclusion: all groups of learners successfully realize the uninflected adjectival form in the predicative position: child L1: 100% (n=350), child L2: 100% (n=90) and adult L2: 98% (n=256) respectively.

Adjectival inflection responses have been elicited via a sentence completion task. The task contained 16 non-derived singular nouns, that are likely to be known by child L1, child L2 and adult L2 participants: 8 neuter and 8 common gender nouns. Each noun is tested in definite and indefinite conditions as exemplified in (9) and (10) for the neuter noun *paard* ‘horse’. Number is kept constant to singular. The experimenter triggered the sentence by pronouncing the underlined words and the task of the subject was to complete the sentence (the correct subject responses are in bold). Previous work on L1 and L2 Dutch indicates that gender is problematic (Van der Velde, 2005; Snow and Hoefnagel-Höhle, 1978; Sabourin, 2003) and involves a tedious learning process (Deutch and Wijnen, 1985). Therefore, we included a control test for gender attribution to the nouns in the adjectival inflection test. In this control test, we elicited for each noun a gender-marked definite determiner (example (11)). The nouns in Standard Dutch are distributed across two grammatical genders. Nouns

that take the definite determiner ‘het’ are neuter, whereas nouns that take the definite determiner ‘de’ are non-neuter (“common gender”).

(9) *Dit is een bruin paard en dit is een zwart paard*

This is a brown horse and this is a black horse

(10) *Mijn poppetje zit op het zwarte paard*

My doll sits on the black horse

(11) *Dit is een boek. Waar is mijn kopje? Mijn kopje staat op het boek*

This is a book. Where is my cup? My cup stands on the book

Gender attribution has been tested at the beginning of each session and the same test, with differently ordered items, was repeated at the end of the session. Each condition was introduced by trial item.

6.2. Results

Table 9 gives the substitutions, respectively without corrections for a learner’s own, and possibly non-target like, gender attribution and with this correction. Correction implies that responses from the gender attribution test have been correlated to the responses from the adjectival inflection task. Corrected responses are restricted to nouns with stable gender. To determine if a noun’s gender is stable, we excluded nouns for which we collected less than two overt gender markings. Since we collected maximally three “gender responses” (twice in the gender attribution test and once in the adjectival inflection test), stable gender marking comprises four possibilities: *de/de* or *de/de/de* (=common gender) and *het/het* or *het/het/het* (=neuter gender). Instable gender marking comprises *de/het*, *de/de/het* and *het/het/de*.

Table 9: Substitutions (%) in adjectival inflection test

| Substitute | Not corrected for gender | | Corrected for gender | |
|----------------|--------------------------|--|----------------------|---|
| | –e | –ø | –e | –ø |
| Context | [-def,+neut] | [+def,-neut], [-def,-neut], [+def,+neut] | [-def,+neut] | [+def,-neut], [-def,-neut] [+def,+neut] |
| Child L1 | 77% 102/152 | 4% 15/368 | 27% 10/37 | 7% 26/367 |
| Child L2 Turk | 84% 111/132 | 7% 20/287 | * | 6% 13/224 |
| Child L2 Moroc | 89% 233/263 | 3% 17/585 | * 8/9 | 3% 11/371 |
| Adult L2 Turk | 54% 44/82 | 30% 58/191 | * | 39% 31/80 |
| Adult L2 Moroc | 32% 37/117 | 67% 189/283 | * 1/6 | 72% 73/101 |

Table 9 shows that the children hardly ever substitute $-\emptyset$. By implication, they are highly accurate with respect to the correct realization of $-e$. The adults do substitute $-\emptyset$. Schwa-substitutions show a different picture. An asterisk (*) indicates the absence of responses, due to absence of stable neuter nouns, which is, in turn, an effect of the overuse of the common gender definite determiner *de*. This overuse happens in all groups. Only the (older) child L1 learners use a fair number of stable neuter nouns. If the child L1 learners use stable neuter nouns, they also use most often the correct adjectival suffix in the special case ($-\emptyset$). The high percentage of schwa substitutions (77%) in Table 9 drops after corrections to 27%: this is the effect of neuter nouns that are common according to the child. For the adults, corrections do not lead to any improvement. Adult responses in all conditions show substitutions in both directions. The Turks tend to substitute $-e$ whereas the Moroccans substitute $-\emptyset$ most frequently.

6.3. Interpretation of results

Children's errors with adjectival inflection turn out to be errors in gender attribution caused by overattribution of common gender. For adjectival inflection this results in

–*e* substitutions. Adult errors can only be partially related to incorrect gender attribution. Unlike the children, they substitute – \emptyset , as was predicted by the hypothesis that the adults underspecify the zero suffix.

The adults also overattribute common gender, but this has no effect on the application of adjectival rules. Adults say for example *de paard* ('the horse') in combination with *een groot paard* ('a big horse'). L1 transfer can only partially explain zero-substitution. The asymmetry between Turks and Moroccans in Table 9 points to transfer - presumably effects of L1 phonology, more specifically the impossibility to have a final unstressed vowel in the Moroccan's L1 (see also Goad, White and Steele, 2003).⁸ However, the Turkish adults make the error as well, even though their L1 does not have this restriction. Hence, transfer does not provide a sufficient explanation for the use of zero-substitutions by adult learners. The comparison between the Turkish adults and Turkish children indicates that age is a significant factor as well: adult learners make an error that the children do not make. The types of errors in the adult sample fit (6b): (6b) predicts that overuse of –*e* in predicative position does not occur in adult L2 Dutch, which is confirmed by the results reported by Weerman et al. (2003), but that overuse of – \emptyset in attributive position does happen.

7. Concluding remarks

In this article, we hypothesized that child and adult learners learn inflectional contrasts differently. Children use a local strategy, are sensitive to syntactic cues and positional information, whereas adults use a global strategy. The effect of this global strategy is that adults, to put it strongly, ignore syntactic cues for specifying

⁸ Although the L1 of the Moroccans marks gender, and Turkish does not, the Moroccans do not profit from their L1 (contra Franceschini and Hawkins, 2004); this may be because their masculine-feminine system does not map onto the Dutch common-neuter gender system.

inflection. Use of the global strategy is caused by the adult's difficulties in the domain of syntax. Earlier reported low accuracy on verb placement tests confirms that the adult learners investigated here are not able to make reliable use of verb placement as a cue for learning targetlike inflectional paradigms. The difference between children and adults in the ability make use of syntax leads to different inflectional paradigms, more specifically, to different inflectional defaults (in terms of Distributed Morphology: different underspecified vocabulary items). Obviously, the child strategy works better, since syntactic information is crucial for specifying agreement paradigms. In this article we did not concentrate on quantitative differences between child and adult learners – although there are significant differences between the two groups in this respect – but we focused on qualitative differences. Our prediction was that children and adults make different types of errors, more specifically, that adult learners underspecify *-en* in the domain of verbal inflection and the zero suffix in the domain of adjectival inflection, resulting in respectively *-en* and zero substitutions. We did not predict these errors in the child data. The experimental results confirmed our predictions in both learner groups.

The results as well as our hypothesis raise various new questions. First of all, the results on verbal inflection show that the adults do not only substitute *-en*, but they also use a significant number of zero substitutions. Is this observation compatible with the claim that adult learners underspecify *-en*? We hypothesized in (5a) and (6a) that $-\emptyset$ is specified as [+fin] in both the child as well as the adult L2 vocabulary. This implies that the zero-suffix, being underspecified for phi features, can appear in both the child and the adult group as a finite substitute (as has been proposed for child and adult L2 German by Prévost, 2003). Note that differences in specificity of vocabulary items (as is the case with verbal *-en* and $-\emptyset$) leads to the counteracting factors.

Assuming that insertion of an underspecified vocabulary item is cheap, processing limitations predict insertion of underspecified vocabulary items (Avrutin, 2005). Thus, processing limitations predict insertion of the least specified vocabulary item, i.e. *-en*, while grammar (instantiated by the Elsewhere Principle) predicts insertion of the most specified suffix (that obeys the Subset Principle). This interaction is expected to lead to optionality and variability (between as well as within subjects), which is indeed confirmed by analyses of individual data (Blom, to appear; see also Sorace (2005) on the issue of optionality in L2 grammars).

Secondly, with regard to adjectival inflection we have found that both the bilingual children and monolingual children under the age of 6 hardly ever produced consistently classified neuter nouns: the child L1 data in the special case condition – indefinite, neuter - come from the oldest age group, i.e. the 6-year-olds. This lack of consistently classified neuter nouns disabled us to interpret the findings of the special case condition. Assuming that specific rules are acquired late, late acquisition of the - very specific - rule that attributive adjectives that modify a neuter singular noun in indefinite DPs is, however, expected. In this respect, the outcome of Laloi et al.’s (2005) study on 7 Moroccan adolescents (16-17 yrs) with a similar age of first systematic exposure to Dutch as “our” child L2 learners is telling: Laloi et al. found that the older child L2 learners performed significantly worse than the monolingual control group and still showed massive overuse of *-e* in the special case condition. Moreover, unlike the younger child L2 learners (in our sample) overuse of *-e* does not correlate with gender attribution: even though the older child L2 learners attribute in 64% (n=56) of the cases correct gender to neuter nouns, they hardly ever produce the correct inflectional suffix in the special case condition 9% (n=111). These results indicate dissociation between gender attribution to nouns and the acquisition of

adjectival inflection system, more specifically, it indicates that children who can be classified as late starters (and have less exposure to Dutch because they start later and they mainly hear Dutch outside their home-situation), do not learn the specific rule anymore. On the basis of this result, we can conclude that the younger child L2 learners in Table 9 do not know the topmost rule of (5b).

This observation leads us to the beginning of this article. Although much more research is needed, a first impression is that our results confirm the idea that L2 acquisition of inflection is a significant factor in loss of inflectional contrast. We have shown that the patterns in adult L2 Dutch can be accounted for by non-targetlike inflectional paradigms that are relatively small and contain underspecified inflectional suffixes. A comparison between our findings and Afrikaans, a language related to Dutch, but heavily deflected, presumably as a result of language contact, is suggestive as well. Recall that in acquisition the distinction between attributive and predicative adjectives is rather stable, but that the special case is less stable in both child and adult L2. This is line with the facts for Afrikaans, which still makes a distinction between predicative and attributive adjectives along the lines of Dutch, but does not have the special case anymore. In the verbal paradigm of Afrikaans only one form remained. For the regular verbs this is the form that is superficially similar to the 1st person singular in Dutch (Afrikaans: *ons werk* ‘we work’), which is precisely the form that we identified as being underspecified in both child (L1 and L2) and adult L2 Dutch.

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