

The Acquisition of Past Tense in English/Norwegian Bilingual Children Single versus Dual Mechanisms

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1. Introduction

The fact that children tend to say things like **goed* and **holded* has been considered the classical example of the fact that they are in the process of acquiring the rule for past tense of regular verbs and they are overgeneralizing this rule to irregular verbs as well.

Whereas generativists (like Pinker and Prince 1988, Pinker 1999, Marcus et al 1992) still embrace this theory that language is in fact rule governed, connectionists argue that language is based on associative networks (Rumelhart and McClelland 1986, Ragnarsdóttir, Simonsen and Plunkett 1999 and others).

Based on the two different approaches to language acquisition mentioned, the following hypotheses can be formulated:

1.1 Single Mechanism Account Hypotheses (Connectionism)

The past tense of all verbs are memorized and organized in the brain/mind by a single mechanism network. In this network verbs are grouped into family resemblance categories based on phonological similarity. The patterns of these categories can be used productively and apply to new verbs based on similarity.

1.1.1 Predictions:

- (1) Children should acquire the past tenses of verbs in the order according to the verbs' type frequency. For Norwegian this means the following acquisitional order: Larger regular class (WL) > Smaller regular class (WS) > Irregular verbs; and for English the order would be: Regular > Irregular.
- (2) All verbs (both regular and irregular) may be affected by type and token frequency as well as factors of phonological similarity. Thus, children should make more mistakes on low frequency regular as well as irregular verbs. Children's errors should be based on phonological similarity to other learned verbs, regular or irregular.

1.2 Dual Mechanism Account Hypotheses (Generative theory)

Children acquire the past tense of verbs by a dual mechanism; regular verbs are acquired by a rule mechanism, which stores verb stems and past tense suffixes and combines these to form past tense. This mechanism is applicable to all verbs, regardless of their phonological properties, and applies unless another (irregular) form has been memorized. Irregular verbs are learned, and stored in a network. This network has the ability to organize the verbs into family resemblance categories, also called associative networks, which can be used productively.

1.2.1 Predictions:

- (3) Regular default verbs¹ will not be dependent on type or token frequency once the default rule has been acquired.
- (4) Only irregular verbs will be affected by type or token frequency because they are memorized and stored in a network.

Ragnarsdóttir et al. (1999) studied Norwegian and Icelandic monolingual children's performance on past tense. Based on their findings, they claim that the reason why Pinker, and other generativists, can still argue for the dual mechanism hypothesis is that they have only studied English. They suggest that languages like Icelandic and Norwegian, which have a somewhat more complex past tense morphology, show that a default rule cannot explain the way past tense is acquired. Rather, they argue that type and token frequency, as well as phonological similarity determine the acquisition of past tense.

In this article I will present some of the results from my Master's thesis *The Acquisition of Past Tense in English/Norwegian Bilingual Children, Single versus Dual Mechanisms* (2002) of three bilingual children and their acquisition of past tense in both languages. First I will present an overview of the verb morphology in the two languages and point out the similarities as well as the differences, before I go on to describe the tests, the subjects and the results. Last, but not least I offer a tentative conclusion.

2. Norwegian and English Verb Morphology

When it comes to the verbal inflection, Norwegian and English are quite similar. Both the distribution of regular and irregular verbs and the basic buildup of the conjugational paradigms are similar, but there are also some differences. Whereas English only has one regular class of inflection

¹ Note that not all regular verb classes function as a default class. See Pinker 1999 and Clahsen 1999.

Norwegian has two. Also, regular past tense in English is created by adding a past tense suffix (-ed), and in Norwegian regular verbs are those which carry a syllabic suffix (WL class: -a/-et and WS class: -de/-te). Figures 1 and 2 show the distribution of verb classes in the two languages:

Figure 1: *The Distribution of Verb Types in English*

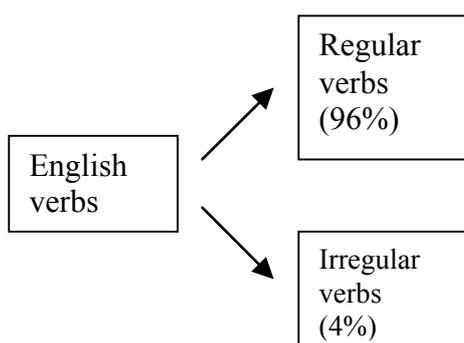
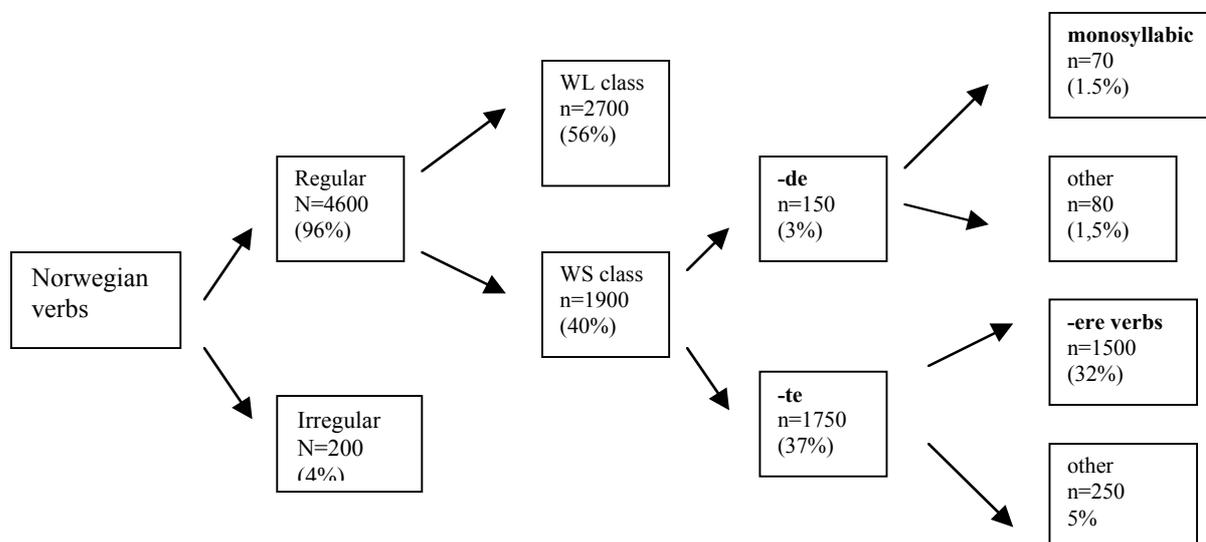


Figure 2: *The Distribution of Verb Types in Norwegian:*



The figures are adapted from Ragnarsdóttir et al. 1999.

3. The Project

Based on the findings from Ragnarsdottir et al., I set out to test the acquisition of past tense in Norwegian/English bilingual children, because these two languages seemed to represent the two different theories at hand. The bilingual children were thought to be good subjects because they represent minimal pairs for these two languages and would be at the same socio- psychological level of development in both languages (DeHouwer 1990). This factor would be very difficult to control for when using three monolingual children from each language.

3.1 *The Subjects*

My subjects were three English/Norwegian bilingual siblings, Christopher 7:9. Anna 5:9 and Emilie 3:8 as well as two Norwegian monolingual children, Ulv 7:10 and Kine 9:6. Christopher, Anna and Emilie were raised bilingually from birth, and their parents practice the one parent – one language principle. The reason why I also tested the monolingual children was because I needed to check whether the bilingual children's performance of Norwegian was similar to that of their Norwegian peers. In addition, it was important to be able to say something about the children's target dialect, the Tromsø dialect, which differs somewhat from the Oslo dialect, which has been studied earlier. This is why Kine's data were also included in the study.

3.2 *The Tests*

The tests were elicitation tasks similar to those used by Bybee and Slobin (1982) and Ragnarsdóttir et al. (1999). The children would be shown a picture of, e.g. a boy falling off a chair. The child would be told that: "*This is a boy who is falling off his chair. He falls off his chair all the time. He did the same thing yesterday*". Then the picture would be turned over and the investigator would ask: "*What did the boy do yesterday?*" The child would answer something like "*he fell off his chair*" or "*he falled off his chair*".

The children were tested on about 60 verbs in each language, including nonsense verbs. The English verbs included in the test were based on a selection of verbs used by Bybee and Slobin (1982). This list included both high and low frequency irregulars, so I also added 7 regular verbs (3 high frequency - 4 low frequency verbs) and 9 nonsense verbs (5 similar to regular verbs and 4 similar to regular verbs). The list of Norwegian verbs used in the test was more or less the same verbs used by Simonsen (2001). However, some verbs were replaced because they were not part of the Tromsø dialect, which differs from the Oslo dialect studied by Simonsen. These verbs were a selection of high as well as low frequency verbs, and

all the verb classes were represented. I also added 7 nonsense verbs (4 similar to regular verbs and 3 similar to irregular verbs).

3.3 Results

When looking at the results in this study, it is important to keep in mind that I am only referring to three bilingual children and two monolingual controls, compared to Simonsen (2001) who has data from about 90 Norwegian children, 30 from each age group (4, 6 and 8 year olds). The group of children I have tested is not large enough to make broad generalizations, but all the same the data do reveal some patterns found in the children I have tested. This may suggest that the results might be representative for the spoken language in this region. The data also show some interesting effects of bilingual acquisition.

As we can see from table 1, there seems to be a development of correct performance with age for the children tested. Also the children perform better in Norwegian than in English. This result may be due to the fact that the children live in Norway and that their exposure to English is limited to their home environment. Thus I assume that Norwegian is their strongest language.

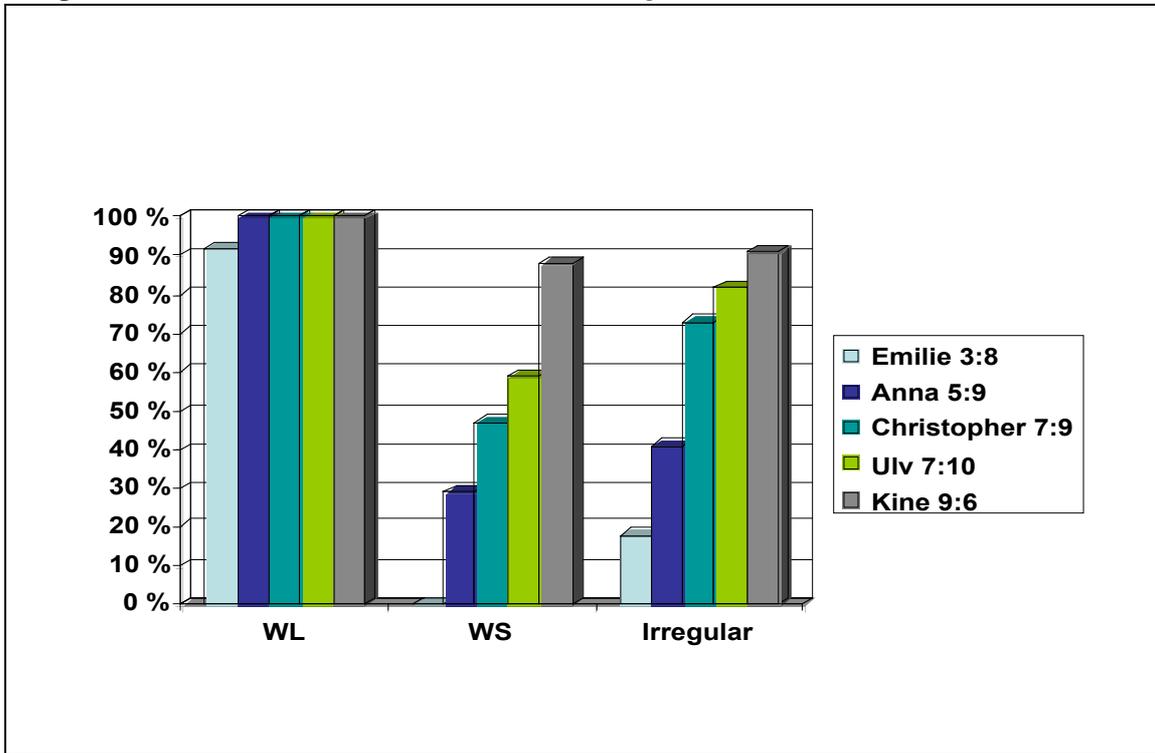
Table 1. *Correct Answers for all Verbs in the Test*

	Norwegian			English		
	Percentage correct	Total number of correct responses	Total number of responses	Percentage correct	Total number of correct responses	Total number of responses
Emilie 3:8	30%	16	52	2%	1	48
Anna 5:9	52%	27	52	35%	17	48
Christopher 7:9	71%	37	52	65%	31	48
Ulv 7:10	79%	41	52	-	-	-
Kine 9:6	92%	48	52	-	-	-

3.3.1 Correct Performance on the Different Verb Classes in the Two Languages

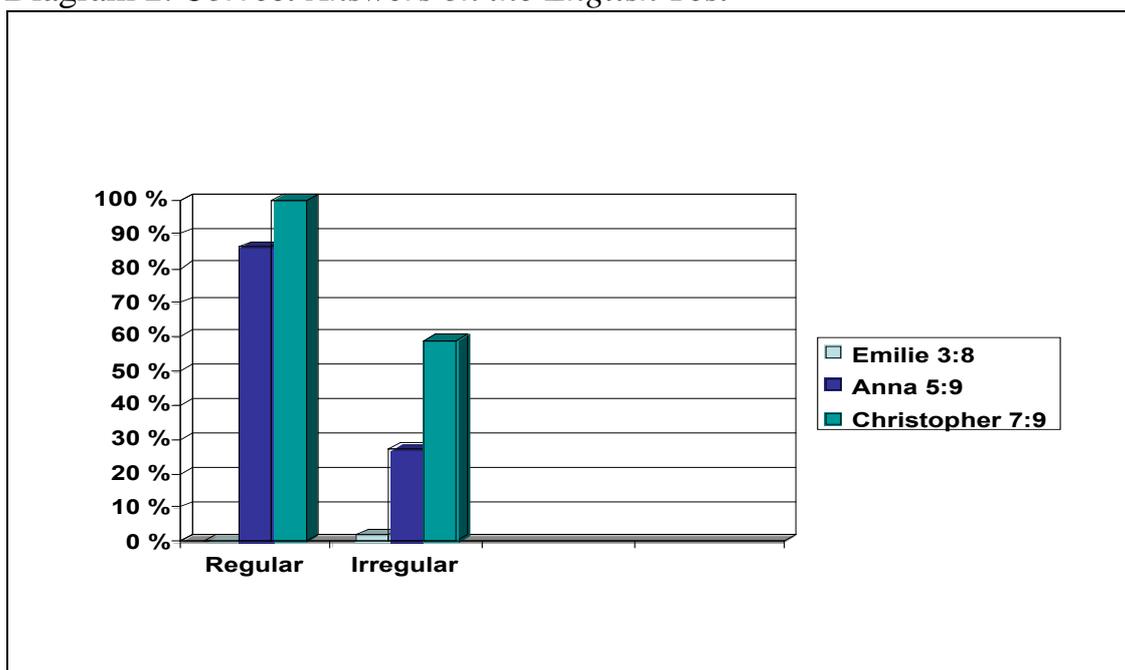
The children's performance also differed between the verb classes the two languages, as shown in diagrams 1 and 2.

Diagram 1. *Correct Answers on the Norwegian Test*



The percentage of correct answers for each verb class in Norwegian shows a developmental profile contrary to what we would expect based on the results from Ragnarsdóttir et al. The single mechanism hypothesis claims that all verbs must be memorized to a certain extent, thus, the type frequency of the verbs should affect the acquisitional pattern, and correct performance should then correlate with the size of the verb classes. This means that the larger regular class (WL) should be acquired before the smaller regular class (WS) and the irregular verbs should be acquired last. Here we see that the WL is generally acquired by all children, but that all the children perform better on the irregular verbs than on the WS. Thus there seems not to be any type frequency effect for the WS or for the irregular verbs in the test. Even though the WS class is less homogeneous than the WL class it is more homogeneous than the irregular verbs, and it has a much higher type frequency than the irregular verb.

Diagram 2. *Correct Answers on the English Test*



The children show the same developmental pattern in English as in Norwegian. However, Emilie hardly produced any past tenses correctly in English. The reason for this was that she had her own way of marking pastness in English, as we will see when we go on to look at the errors the children produced.

3.3.1 Errors

3.3.1.1 Error Types in Norwegian

The Norwegian error types discussed in this article are the following:

a) Overgeneralizations of the WL suffix –a (Gen-a):

- i) *syng* - **synga* (*sang*) (SING)
- ii) *spise* - **spisa* (*spiste*) (EAT)
- iii) *spå* - **spåa* (*spådde*) (FORETELL)
- iv) *reparere* - **reparera* (*reparerte*) (REPAIR)

b) Overgeneralizations of the Ws suffix –te (Gen-te): (I did not find any such errors)

- i) *nikke* - **nikte* (*nikka*) (NOD)
(conjugation possible in other dialects)
- ii) *hoppe* - **hoppte* (*hoppa*) (JUMP)
(conjugation possible in other dialects)

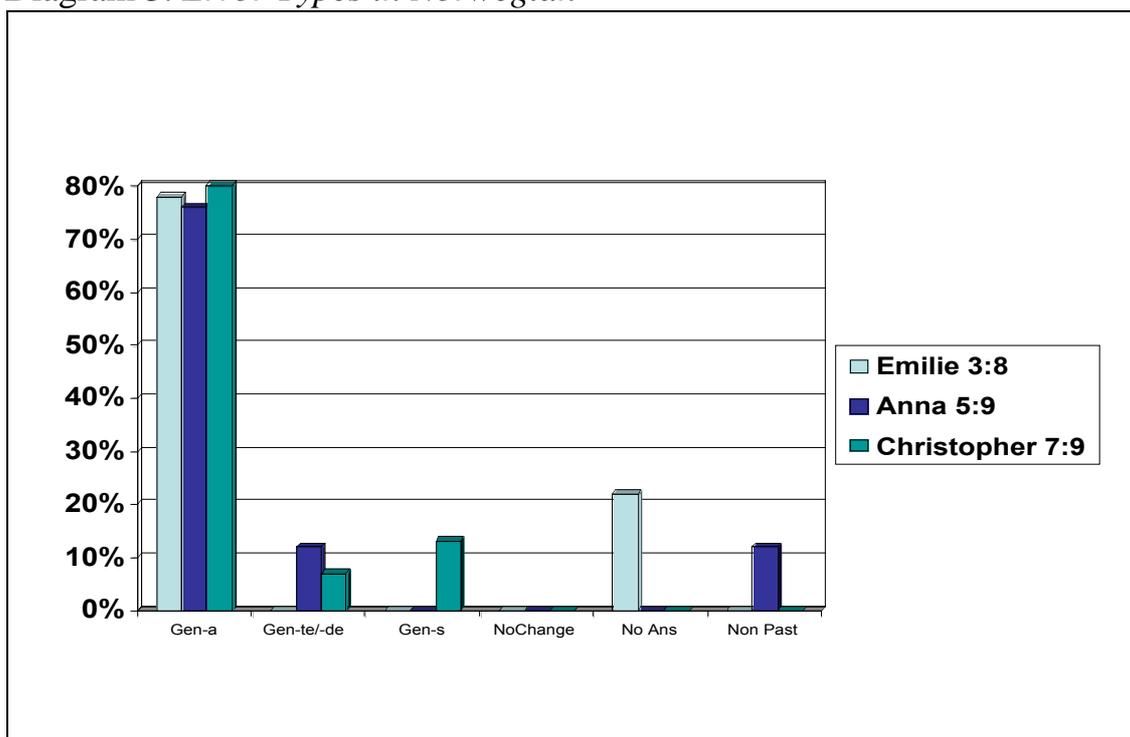
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- c) Overgeneralizations of the Ws suffix **-de** (Gen-de):
- i) *gi* - **gidde* (*ga*) (GIVE) => similar to *smi* – *smidde* (FORGE)
 - ii) *stå* - **stådde* (*stod*) (STAND)
=> similar to *så* – *sådde* (SOW)
- d) Overgeneralizations of irregular patterns (Gen-S):
- i) *sy*- **sø*y (*sydde*) (SEW) => similar to *fly* – *flø*y (FLY)
 - ii) *ringe* - **rang* (*ringte*) (CALL, RING)
=> similar to *synge* – *sang* (SING)

In addition, the data was scored for the following error types:

- e) No Change (no change in the verb at all from present to past tense)
- f) No Answer
- g) Non Past (mostly answers in the present tense)

The error pattern shows that the WL suffix is applied across the board, and does not seem to be dependent on phonological factors. This is suggested by the errors found in *a*) iii) and iv). Errors like the ones in *b*) were not found in these data. Thus, the errors in the second column of diagram 3 refer to errors like those in *c*). The errors in both *c*) and *d*) are all based on phonological similarity, as illustrated in the examples.

Diagram 3. *Error Types in Norwegian*

As we can see from diagram 3, the major source of errors in Norwegian is overgeneralizations of the WL suffix *-a*. Overgeneralizations into the WS class are very rare, and the proportion of these errors compared to the other error types do not increase with age. Anna, who is 5:9, produced more overgeneralizations into the WS class than her older brother. This result does not correlate with the results from Simonsen (2001) who finds that the proportion of errors of overgeneralization into the WS class compared to overgeneralizations into the WL class increase with age from the age of 6 to the age of 8. Simonsen argues that the shift in choice of class utilized for overgeneralization supports the single mechanism account rather than the dual mechanism account. As we have seen this study does not replicate these results.

3.3.1.2 Error Types in English

Some of the error types found in English were similar to those found in Norwegian and some were not, as we can see from the examples below:

- h*) Overgeneralizations of the regular suffix **-ed** (Gen-ed):
- i) *go - *goed*,
 - ii) *hit - *hitted* (Anna)

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- i) Overgeneralizations of an irregular pattern (Gen-S):
 - i) *drive* - **drew* (=drove) (Christopher)

- j) Improper *do*-insertion (Did+inf):
 - i) **did go* (Emilie)
 - ii) **did eat* (Emilie)

- k) *Do*-insertion + overgeneralization of the regular suffix **-ed** (Did+ed):
 - i) **did teached* (Emilie)
 - ii) **did maked* (Emilie)

- l) Overgeneralization of the regular suffix **-ed** + infinitive (-ed+inf):
 - i) **dided eat* (Emilie)

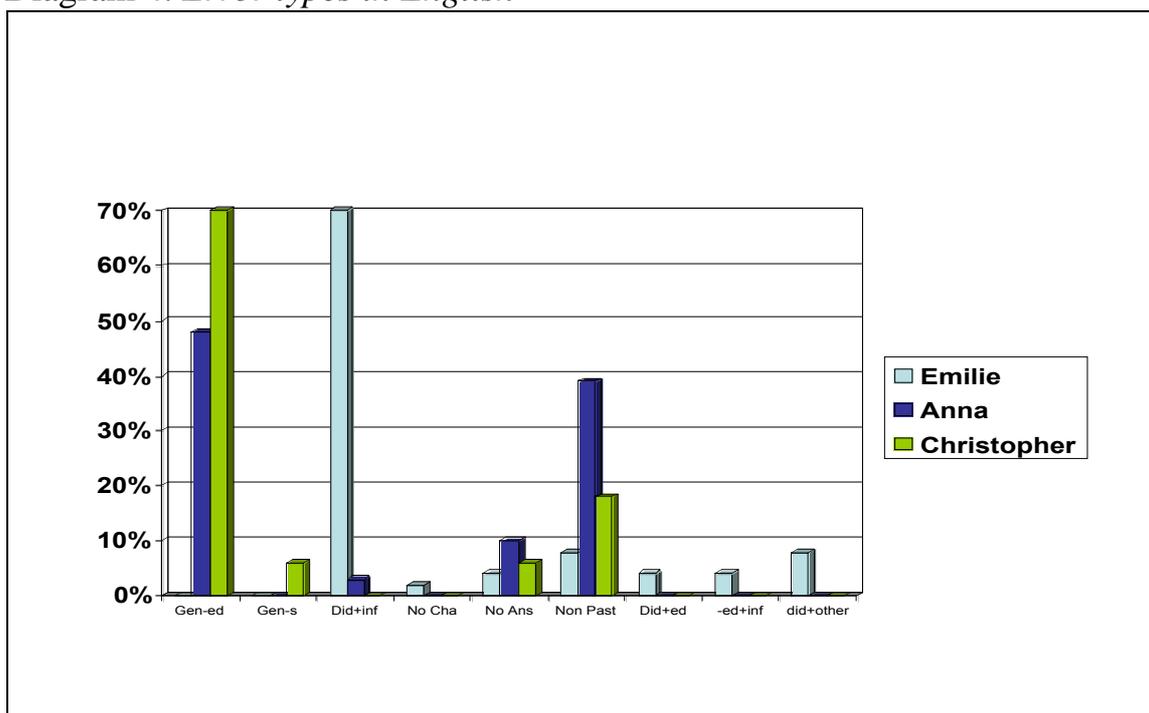
- m) *Do*-insertion + another sentence element (Did+other):
 - i) **did like this* (Emilie)
 - ii) **did his finger* (Emilie)

- n) No change on the verb:
 - i) “*Yesterday it* snow*

There were some odd mistakes as well, and the most interesting of these was produced by Anna (5:9):

- o) *break* - **breakte* (=broke) (Anna) => similar to the corresponding Norwegian verb *brekke* – *brekte*; this is the kind of error that I did not find in the Norwegian tests (see example *b*))

As we can see in diagram 4, Christopher and Anna performed in much the same way in English as in Norwegian in that the majority of the errors were overgeneralizations of the regular class suffix (*-ed*). Apart from that they had some NO ANSWER errors and some NON-PAST errors. For Anna the number of NON-PAST errors was fairly high, because she had a tendency to repeat the verb in the present tense if she was uncertain, rather than to give an answer in the past.

Diagram 4. *Error types in English*

Emilie, on the other hand, had her own way of marking pastness in English, which I have called the *did+infinitive* error as in *g*). She basically put *did* in front of any verb, and seemed satisfied with that. However, she did show signs of the fact that she was in the process of learning the *-ed* suffix when she produced errors like *j*) and *k*) above. However, it seemed as though she was applying her *did*-construction as a default, because this construction is simpler than marking past tense on the verb itself. This kind of error has also been found before in spontaneous speech samples of both monolingual and bilingual children (Bohnacker 1999). Thus, this error might be a stage that English speaking children may go through, because children tend to prefer the simplest option when possible.

All Gen-S errors (both languages) and Gen-de errors can be interpreted as based on phonological similarity with another verb of the class it is overgeneralized into. There was one peculiar error though, which I spent some extra time wondering about, error *o*) above: **breakte*. This error looks like an overgeneralization of the Norwegian WS class suffix *-te* to an English irregular verb. This word might have been the example that could separate the two theories at hand. On the one hand, *breakte* does seem to demonstrate that the Norwegian WS *-te* suffix can replace the English regular *-ed* suffix in default position, thus leading us to believe that the two suffixation processes must have the same kind of function in the two languages. This may be possible if we assume that it is unlikely that a child would build one language with a dual mechanism and one language with a

single mechanism network. As a result, both languages should have rules or they should not have rules. As it seems quite unlikely that the WS class can function as the default suffixation in Norwegian (Ragnarsdóttir et al. 1999), we may have a single mechanism network at hand. However, there is at least one problem with this analysis; *breakte* is similar to the Norwegian past tense verb *brekte*, both phonologically and semantically. Thus, this error may just as well be a result of the English verb being similar to the Norwegian corresponding verb. If this error is in fact the result of phonological similarity, it does not represent any clear evidence in any direction.

4. Conclusion

In my data I do not find any clear evidence to support the single mechanism hypothesis, but rather, the data seems to suggest that there may be a dual mechanism at work in both languages. Overgeneralizations into the other verb classes than the default one (the regular class in English and the WL regular class in Norwegian) are exclusively of the type that can be interpreted as being based on phonological similarity. Errors of overgeneralization of the WL class in Norwegian and the regular class in English do not seem to be dependent on phonological similarity. This seems to be demonstrated in examples a) iii) and iv).

My data does not seem to support the findings from Simonsen (2001) with respect to the order of acquisition of the inflectional classes. The error patterns that I have found are also not in accordance with Simonsen's findings. The differences may be attributed to the difference between the Norwegian dialects we have studied or to the fact that my study is very small in scale. Further studies of this kind are needed to clarify this point, but all the same, the results from my tests seem to suggest that there are in fact rules at work in the way children deal with past tense for regular verbs and networks for irregular verbs. These results then seem to support the Dual Mechanism Account rather than the Single Mechanism Account.

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