MORPHOLOGICAL DEVELOPMENT

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SUMMARY

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Language maximises the distinct advantages of words and rules by comprising both, each handled by a distinct psychological system. There is a lexicon of words for common or idiosyncratic entities – the psychological mechanism designed to handle it is simply a kind of memory. And there is a separate system of combinatorial grammatical rules for novel combinations of entities; the psychological mechanism designed to handle it is syntactic computation. (Pinker 1998:221)

KEY POINTS:
In this chapter you will learn about:
• accounts of how children cope with regular and irregular inflection
• possible explanations of the phenomenon of overregularization in child speech
• the causes of regularisation and irregularisation in the acquisition of inflectional morphology
• derivational rules and acquisition
• children’s knowledge of the ordering of constraints of inflectional and derivational rule application

1. Introduction

Empirical data of early grammars reveal that children go through a developmental stage when they tend to overgeneralize the pattern of regular morphology, producing incorrect past tense forms such as *comed* or *goed* and incorrect plural forms such as *mouses* or *tooths*. To make things even more puzzling, they begin to produce the regularised *goed* after having used the correct irregular *went*, or *mouses* after having acquired the correct plural form *mice*. They also go through a stage when they extend irregular past tense patterns to regular verbs, producing pairs such as *bring-brang* or *trick-truck*.

Experimental studies and longitudinal data also reveal that children are able to extend the regular pattern of inflection to new lexical items and to make use of derivational rules to create new words. This proves that the child is not a rote learner, that he/she is as creative in the domain of morphology as he/she is in the domain of syntax.

Traditionally, morphological rules fall into two main classes: inflectional and derivational. Derivational rules create new words, whereas inflectional rules change the form of a word according to its relation to other words in a sentence, i.e. according to the syntactic environment in which the word occurs. According to the ‘split morphology’ hypothesis (Perlmutter 1988), all derivational morphology belongs to the lexicon or to the module called the morphological component, whereas all inflectional morphology is treated non-lexically, i.e. it is transformationally derived at the syntactic level (see, for example, Anderson 1982). The weak lexicalist hypothesis assumes that only some derived elements belong to the
lexicon, while others are derived transformationally (Chomsky 1970). The strong lexicalist hypothesis, recently incorporated into the Minimalist Program, assumes that items come inflected/derived from the lexicon. At the opposite end, Distributed Morphology (DM) (Halle and Marantz 1993) assumes that both inflectional and derivational morphology are transformationally derived. Vocabulary items are inserted in the syntax at different terminal nodes. The theoretical consequences of these approaches for the domain of acquisition are radically different. The ‘split morphology’ hypothesis implies that inflectional and derivational morphology are probably acquired differently. At the opposite end, the DM approach implies that children acquire inflectional and derivational morphology in a similar way. A challenging question would then be if there were any difference and/or any connection between children’s acquisition of inflectional and derivational morphology. Things get even more complicated. There is regular and irregular inflection. How do children cope with these two sub-domains?

The questions which we will be addressing in this chapter are the following:

(i) are there any innate constraints which guide the children through their language development in the domain of morphology?
(ii) what exactly in the input is responsible for the child’s acquisition of the inflectional system?
(iii) how can one account for the overregularization tendency in early grammars?
(iv) how can one explain children’s tendency to extend the irregular pattern to regular forms?
(v) do they acquire regular and irregular inflectional morphology in a similar way or do they have to resort to different learning strategies?

The focus will be on the acquisition of inflectional rules, but derivational rules as well as the possible connection(s) between the two types of rule will also be tackled.

2. The acquisition of inflection

2.1 Regular inflection

Berko (1958) was the first linguist to provide experimental evidence that children have knowledge of morphological rules, being able to extend them when dealing with new words. She tested for knowledge of regular inflectional morphology: the plural -s of nouns, the two possessive forms of the noun (the of genitive and the ‘s genitive), the third person singular -s, the regular past tense form, the present participle -ing as well as the comparative and the superlative of the adjective.

English monolinguals aged 4 –7 years were shown various cards and supplied made-up words for the object/action in the card. Then they were asked questions which required them to use the right inflection with the made-up words. The reason for which invented words were used in the experiment was that in this way one could test the child’s ability to extend morphological rules to new words providing, at the same time, a strong argument against the rule-rote theory1. Several actual words were also included to test children’s knowledge of some of the irregular patterns.

In order to test knowledge of the noun plural formation rule, the child was presented a card with one bird-like animal and then with two bird-like animals. The

1 For a different point of view, see Park (1978), who studied the development of plurals in German-speaking children on the basis of observational data. Park’s conclusion is that apart from analogy, rote learning plays a dominant role in the acquisition of plural forms.
The experimenter would say: «This is a wug. Now there is another one. There are two of them. There are two…». The child was thus required to supply the plural form of a completely new lexical item.

The results of the experiment with regard to the tested children’s knowledge of the regular plural form of nouns (presented in Table 1) provide evidence that children aged 4-7 years have knowledge of the rule dealing with regular plural inflection. They can extend the /s/ and /z/ allomorphs to new words. However, it seems they cannot extend the /iz/ allomorph (see the low percentage of correct plural forms in the case of gutches or tasses), in spite of the fact that they already know the plural form of words like glass.

Table 1

<table>
<thead>
<tr>
<th>Item</th>
<th>Allomorph</th>
<th>Percentage correct</th>
</tr>
</thead>
<tbody>
<tr>
<td>Glasses</td>
<td>/iz/</td>
<td>91</td>
</tr>
<tr>
<td>Wugs</td>
<td>/z/</td>
<td>91</td>
</tr>
<tr>
<td>Luns</td>
<td>/z/</td>
<td>86</td>
</tr>
<tr>
<td>Tors</td>
<td>/z/</td>
<td>85</td>
</tr>
<tr>
<td>Cras</td>
<td>/z/</td>
<td>79</td>
</tr>
<tr>
<td>Tasses</td>
<td>/iz/</td>
<td>36</td>
</tr>
<tr>
<td>Gutches</td>
<td>/iz/</td>
<td>36</td>
</tr>
<tr>
<td>kazhes</td>
<td>/iz/</td>
<td>31</td>
</tr>
<tr>
<td>Nizzes</td>
<td>/iz/</td>
<td>28</td>
</tr>
</tbody>
</table>

(Berko 1958: 161)

In order to test for children’s knowledge of the regular past tense inflection, the experimenter showed the child a picture of, for example, a man standing on the ceiling. Then, she would say: «This is a man who knows how to bing. He did the same thing yesterday. Yesterday he…». And the child was requested to provide the past tense form of the made-up verb. The results (see Table 2 below) show that children have knowledge of the allomorphs /t/ and /d/ but they do not seem able to extend the rule for forming the past tense of melted (which they have acquired) to new verbs, i.e. they cannot handle the allomorph /id/ (see the correct percentage in the case of motted and bodded). The tendency to extend the regular pattern to any form is obvious in the case of made-up verbs such as bing and gling, where only one child (of the 86 who were interviewed) said bang and one child said glang. Virtually all –ing verbs have irregular past tense forms and adults, when tested on the same items, chose the irregular pattern over 50% of the time.

Table 2

<table>
<thead>
<tr>
<th>Item</th>
<th>Allomorph</th>
<th>Percentage correct</th>
</tr>
</thead>
<tbody>
<tr>
<td>Binged</td>
<td>/d/</td>
<td>78</td>
</tr>
<tr>
<td>Glinged</td>
<td>/d/</td>
<td>77</td>
</tr>
<tr>
<td>Ricked</td>
<td>/t/</td>
<td>73</td>
</tr>
<tr>
<td>Melted</td>
<td>/id/</td>
<td>73</td>
</tr>
<tr>
<td>Spowed</td>
<td>/d/</td>
<td>52</td>
</tr>
<tr>
<td>Motted</td>
<td>/id/</td>
<td>33</td>
</tr>
<tr>
<td>Bodded</td>
<td>/id/</td>
<td>31</td>
</tr>
<tr>
<td>Rang</td>
<td>/ /</td>
<td>17</td>
</tr>
</tbody>
</table>

(adapted from Berko 1958: 163)
2.2 Irregular vs. regular inflection

2.2.1 The question

The next legitimate question addresses children’s knowledge of irregular forms, which are (mainly) unpredictable. Do they acquire regular and irregular forms in the same way and/or at the same stage?

Traditionally, it has been assumed that children create inflectional rules in order to generate regular forms (for example, English-speaking children create the inflectional rule *add* –*ed* before they can use regular past tense forms). Irregular inflectional forms, being unpredictable, would have to be memorised individually.

Pinker (1991, 1998) argues against such an explanation which he calls «inadequate» because it cannot account, among other things, for the fact that irregular past tense forms fall into similarity groups (*sing*/*sang*, *ring*/*rang*). Nor can it explain why children may extend these irregular patterns to new forms, coming up with *bring*/*brang*, *bite*/*bote*.

2.2.2 A dual-mechanism model

Pinker & Prince (1988, 1992), Pinker (1991, 1998) argue for a theory of language which contains both a *computational component*, with specific rules and representations (responsible for the regular forms), and an *associative memory system*. Regular inflection is productive and open ended, and involves symbol-manipulating rules of grammar. Irregular forms are ‘memorised pairs of words, but the linkages between the pair members are stored in an associative memory structure fostering some generalisation by analogy’ (Pinker 1991: 531). Within this dual-mechanism model, *string* and *strung* are separate items but they are, at the same time, represented as linked words. This mental representation may overlap with similar forms. This can account, on the one hand, for the fact that similar pairs are easier to learn and, on the other hand, for the existence of overextension of the irregular patterns.

Such a view departs from the unitary representation of inflection, like the one proposed by Rumeelhart and McClelland (1986), according to which regular and irregular morphology are treated as belonging to one single associative network. It also departs from the traditional model, within which regular forms are rule-based, whereas irregular forms are rote-learned. According to Pinker (1991, 1998) and Pinker and Prince (1992), the acquisition of irregular forms is affected by properties of associative memory (such as similarity or frequency) whereas the acquisition of regular forms is linked only to the computational component. The acquisition of regular and that of irregular inflection are seen as representing two qualitatively different psychological mechanisms. Regular inflection is based on symbolic rules, whereas irregular inflection is based on an associative process of storing information. Regular past tense forms, for example, do not depend on similarity to existing regular verb forms nor do they depend on the frequency\(^2\) with which the verb is encountered in the input. The regular rule, Pinker claims, applies as a default, i.e. whenever the irregular form is blocked.

Irregular forms are not memorised individually by mere rote, though. Errors of the type in (1) below, attested in child English, provide evidence that patterns can be detected among irregular forms as well:

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2 For a different point of view, according to which frequency in the input is relevant, see Bybee (1991).
This suggests that ‘irregular pairs are stored in a memory system that superimposes phonological forms, fostering generalisation by analogy’ (Prasada and Pinker 1993:2). This distinguishes the creation of irregular from that of regular forms, which are created via a ‘default suffix concatenation process capable of operating on any verb, regardless of its sound’ (Prasada and Pinker 1993:2). Only spontaneous irregularisation tends to be phonologically similar to irregular pairs.

One strong prediction of the dual-mechanism model is that it should be possible to find individuals whose regular morphology is impaired, whereas the irregular one is intact. This prediction is borne out by case studies of language impaired individuals. Broca’s aphasics, for example, have problems reading aloud the regular past tense forms of verbs (they pronounce smiled as smile or wanted as wanting) but they can read irregular past tense forms with accuracy. SLI individuals also have difficulty with the acquisition of regular forms, while they acquire irregular forms relatively normally.\footnote{For more on language impaired individuals see Chapter 1.}

Another interesting prediction (also borne out by empirical facts) is that irregular forms can enter compounds, since they are memory-listed. Regular forms, which are computed at the output end of the morphology system, cannot appear in lexical compounds. The two types of morphological forms differ with respect to compounding. For example, one can say mice-infested but not *rats-infested. As will be shown in section 4 of this chapter, children have knowledge of this distinction.

Further evidence in favour of the dual-mechanism model comes from the acquisition of German, a language with rich inflection. Longitudinal data from monolingual German-speaking children show that they make a qualitative distinction between regular and irregular inflection (Clahsen, Rothweiler, Woest and Marcus 1992).

### 2.3 Overregularisation

#### 2.3.1 The phenomenon

Empirical data of spontaneous child English as well as experimental results point to the fact that ‘children are pattern makers. And when they begin to acquire the inflections that mark tense, for instance, they typically take irregular verbs such as break, bring, and go, and treat them as if they belonged to the regular paradigm of walk, open, and jump’ (Clark 1987: 19). This pattern-making process is preceded by a stage during which the child uses the irregular forms correctly. It looks as if children rejected irregularities. However, during this pattern-extending stage, the child still uses the correct irregular forms. ‘Irregular forms rarely drop out, but rather continue to compete with their overregularised counterparts throughout the period of error making’ (Bowerman 1982: 342).

Maratsos (1987: 19) noticed the existence of the same phenomenon:

‘[… ] children may alternate between the overregularized -ed form and the irregular form for a period of months to years, using both broke and breaked […]. Their analysis and resolution of such alternatives is a long-drawn-out tabulation process, not one which quickly seizes upon one or two properties of the language as heard’.

Stages of morphological development:
(i) the correct irregular forms are acquired;
(ii) the regular pattern is detected;
(iii) the regular pattern is extended to all the forms; the irregular form can be extended to all the forms;
(iv) both correct and overgeneralised forms are used;
(v) regular and irregular forms are used correctly.
Marcus et al. (1992) analysed 11,521 past tense utterances from the spontaneous speech of 83 children. The results showed that children overregularised the past tense in only 4% of the situations. This suggests that the correct irregular forms are not completely replaced with the overregularised regular ones.

Children go through several stages of morphological development before acquiring the correct regular forms: they begin with the correct irregular forms but, after acquiring the regular pattern, they extend it to all the forms. At this stage, they use both the overregularised form and the correct irregular one. After a while, they stop overregularising and they start using all the forms (regular and irregular) appropriately.

Which is the possible explanation of this puzzling developmental process? The traditional explanation of overregularisation is that the younger child simply memorises the correct irregular form (which is encountered in the input) and then repeats it. At this stage, it is assumed that the child has no knowledge of the pattern of regular past tense forms and hence no overextension or overregularisation is possible. When the child has acquired the pattern, he/she will extend it to all the verbs and will start to use incorrect overregularised past tense forms. However, straightforward as it might seem at first sight, this explanation is not without problems. Marcus et al. (1990) discuss some of the problems which such an account encounters. Adults, just like children, have knowledge of the pattern of regular past tense inflections. If knowledge of the pattern is the one which leads to overregularisation with young children, how can we account for the fact that adults do not use comed instead of came? This hypothesis does not predict (nor explain) that children may use the correct irregular forms as well as incorrect overregularised forms at the same stage. From the point of view of learnability, such an account cannot explain how children give up overregularisation in the end.

The explanation that children use the correct irregular forms at a very early stage because they have not heard the incorrect regularised form in the input is untenable. New verbs enter the language quite frequently and adults accept or create past tense forms for such verbs which they have not heard before:

(2) Yeltsin has finally out-Gorbachev’d Gorbachev . (Marcus et al. 1990 :8)

This means that children’s overregularisation process is of a different nature. What linguists have labelled the blocking principle or the unique entry principle (Pinker 1984) does not seem to apply in a similar way in child and adult grammars. The very fact that at a certain stage children may use both the correct irregular and the incorrect regularised form questions their knowledge of this principle. Do they acquire it at a later stage? How do they do it? Children do not seem to receive any negative feedback. Or, if they do, they do it rarely and with no success. For example, Zwicky (cited in Marcus et al. 1990: 12) describes the overregularisation of participles by his daughter, aged 4; 6. He reports that six subsequent months of frequent correction by her parents had no noticeable effect.

Can indirect negative evidence help them, i.e. is it enough to notice that a form like comed does not exist in the input to realise that this is not a correct form? Marcus et al. (1990) argue that children do not receive any evidence, of any kind, that a form like breaked or comed is incorrect. This information is, actually, unavailable. Which means that one has to look for the relevant explanation somewhere else.

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4 The blocking principle = an idiosyncratic form listed in the lexicon as corresponding to a particular grammatical form of a word will block the application of a general rule to that word.
2.3.2 The blocking-and-retrieval-failure hypothesis

One possible way out would be to assume that children’s language system incorporates a mechanism which implements blocking. When a child hears the correct irregular past tense form of a verb, he/she will store it in the lexicon. The mere presence of this idiosyncratic form in the lexicon will then block overregularisation. The advantage of this account is that it can nicely explain the fact that children can attain knowledge of morphology in the absence of negative evidence. But it can incorrectly predict that children do not use both the correct irregular form and the incorrect overregularised one at the same stage. Blocking cannot explain the empirical data nor can it explain why children and adults appeal to overregularisation in different circumstances.

Marcus et al. (1992), assuming a dual-mechanism model, propose that children store the correct irregular form in the lexicon but cannot access it (for memory reasons) all the time. When they can retrieve the correct irregular form from memory, the default regular rule cannot apply, it is blocked. But when the irregular form cannot be retrieved, i.e. when the associative lexically based network fails to provide the irregular form, the child will appeal to overregularisation. The regular rule applies by default, since nothing blocks it. They call this the blocking – and – retrieval – failure hypothesis. The advantage of such an account is that it links retrieval of irregular forms to memory. Memory storage is probabilistic and it depends on frequency of exposure to each particular idiosyncratic form. This will predict that low-frequency irregular forms are prone to overregularisation, i.e. children tend to overregularise those verbs which are less frequent in the input. For example, we expect a child to use the correct past tense form of a verb like say most of the time, while the past tense form of a verb like win may often be used incorrectly. It also predicts that overregularisation applies in a similar way with children and adults. Adults can make errors (under time pressure, for example) but most of these errors regard low-frequency irregular verbs.5

In a nutshell, very young children are assumed to have no knowledge of the regular –ed pattern. At this early stage, they memorise (regular and irregular) past tense forms and use them correctly, but no general rule has been extracted. In early English, past tense form errors are very rare and children seem to be unable to generalise a certain pattern to new forms. During the next stage, when they have acquired the regular pattern, they begin to extend it to irregular verbs as well, producing occasional overregularised forms. At this stage, the rule-based mechanism becomes operative. But the irregular forms have already been stored in the lexicon and can, sometimes, be retrieved. This explains the fact that, at this developmental stage, children can use both the correct irregular and the incorrect overregularised form of one and the same verb. Hearing the irregular forms more often, they will consolidate them in memory and will be able to retrieve them more and more often until they give up overregularisation.

Further evidence in favour of the blocking-and-retrieval-failure model comes from the domain of noun plural overregularisations. The model predicts that a period of correct usage of plural forms should precede overregularisations, i.e. overregularisation begins after the child has learned the regular default rule, which can be applied whenever retrieval from memory of the correct irregular form fails.

Marcus (1995) compared noun plural overregularisations to past tense overregularisations in the spontaneous speech of 10 monolingual English-speaking children (CHILDES database, MacWhinney and Snow 1985). The comparison showed

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5 In the history of English, lower frequency irregular verbs became regular over time (Bybee 1985).
that children begin to overregularise noun plural forms after a period of correct plural usage. Also, the overall rates of noun plural overregularisations are rather low, just like in the case of past tense overregularisations.

These data suggest that overregularisations of past tense and plural forms are produced by the same mechanism. The fact that the number of irregular plural forms is smaller than that of irregular past tense forms did not affect the rate of overgeneralisation.\(^6\)

A few solutions have been suggested so far:

(i) young children have knowledge of regular inflectional morphology
(ii) overregularisation could be explained by appealing to the blocking-and-retrieval-failure hypothesis
(iii) the acquisition of regular and that of irregular forms fall within the domain of different mechanisms
(iv) children are not mere rote-learners.

### 2.3.3 Some inflection markers are not overgeneralised

The -\textit{ing} verb inflection, the earliest which English-speaking children seem to acquire, is rarely if ever overgeneralised.

This may be due to the fact that children use a different learning strategy in the case of the progressive marker. It might be the case that children do not learn a general rule, but individual instances of verbs which can take the progressive. That could explain why they make no overgeneralisation errors.

But if children do not learn the rule, how do they extend the use of the progressive to verbs which they have not met in the progressive in the input?

Kuczaj (1978) puts forth a different hypothesis: children do not overgeneralise the progressive because there are no irregular verbs to which it could be overgeneralised. The progressive can co-occur with many verbs; under special circumstances, even with states which are defined as resisting the progressive.

Kuczaj proposes that one should distinguish between two types of possible overgeneralisations:

(a) a regular rule may be applied to an irregular form (as in \textit{goed})
(b) an inflection is used with verbs which do not take that inflection in adult language, but which are not morphologically irregular (as \textit{knowing} in *I am knowing English.)

Empirical data from child language show that type b is almost never encountered. According to Bickerton’s (1981, 1984) language bioprogram hypothesis this may be due to the fact that certain semantic distinctions, such as state vs. process, are innate. Children do not use the morphological marker –\textit{ing}, associated with processes, precisely because they have some a priori knowledge about the semantics of predicates.\(^7\)

Children may, however, occasionally extend the progressive to newly created verbs as in the following examples, which suggests that they are aware of the pattern:

\begin{enumerate}
  \item It's weather out there, too. Why is it \textit{weathering}? Is that weather?
  \item I'm \textbf{sticking} it (= hitting it with a stick) and that makes it go really fast.
\end{enumerate}

\(^6\) A different position is defended in Marchman et al. (1997) where it is argued that children are more likely to produce plural overregularisation than past tense overregularisation.

\(^7\) For more on the acquisition of aspect and aspect markers, see 5.2 The Acquisition of Tense and Aspect.
2.3.4 Overregularisation and lexical development

One interesting question with respect to language development addresses the existence of a possible link between lexical acquisition and morphosyntactic development. The answer to this question crucially relies on the general view about grammar, in particular whether grammar is assumed to be or not to be lexically based. Cognitive Grammar and Lexical-Functional Grammar, which subscribe to the view that grammar is lexically based, may provide a theoretical framework for the postulation of a tight relationship between lexical and grammatical development. Within a generative approach to acquisition, morphosyntactic development is viewed as caused by properties of the grammatical system itself and, possibly, by maturation. Vocabulary size does not directly trigger morphosyntactic development. Moreover, acquisition of grammar and lexical acquisition are assumed to possibly rely on different mechanisms.

We are thus faced with two radically different positions:
(i) lexical acquisition and acquisition of grammar are strongly interconnected, so that the acquisition of morphosyntax is dependent on lexical development;
(ii) there is a strong dissociation between the mechanisms guiding the acquisition of vocabulary and that of morphosyntax; consequently, the former cannot determine the latter.

The view in (i) is defended, for example, in Marchman and Bates (1994), where it is argued that vocabulary size determines morphological development. In particular, they claim that vocabulary size is tightly linked to the process of overregularisation. They analysed parental input data from 1,130 monolingual English-speaking children aged 1; 4-2; 6 with a view to testing whether there is any relationship between the children's vocabulary growth and their morphological development. The study focused on the usage of (regular and irregular) past tense forms.

The hypotheses they wanted to test were whether vocabulary size is related to the early correct usage of past tense forms and whether overgeneralization errors begin to occur only when verb vocabularies have become sufficiently large.

The results of their study show that very early lexicons (less than 10 verbs) are dominated by irregular verbs; when the children's vocabulary size increases to about 20–30 verbs, it still contains more irregular than regular verbs but no irregular verb is produced in the past tense. When the vocabulary size is lower than 50 items, only half of the irregular verbs in the early lexicon were produced only as stems. As soon as the number of verbs grows over 50, the number of stem-only forms begins to decrease. And it is only after the lexicon contains over 90 verbs that the mean number of past tense forms produced correctly exceeds the stem-only forms in frequency. Increase in vocabulary is thus taken to lead to extension of the regular pattern to novel forms. They take these results as proof that children learn morphology at the same time that their vocabularies undergo expansion and consequently that there is a strong interrelation between vocabulary size and morphosyntactic development.
However, this relationship seems to be more of a statistical artefact. We do expect children to overgeneralise more when they know more verbs. The increase of overgeneralization errors cannot be the result of vocabulary growth per se. Vocabulary growth simply provides the opportunity for more errors. Studies of individuals such as Laura (see Chapter 1) have proved that impairment in the domain of vocabulary does not affect grammatical knowledge. Also, studies of aphasics also show that only one area (grammar or lexicon) may be affected, with the other one remaining intact.

One should notice that denying a tight link between the two sides of language development does not deny that vocabulary size may offer the opportunity of morphosyntactic development. A structure-building model of syntactic development can very well accommodate this idea: the child begins with a lexical stage and enters a functional stage after having acquired a certain number of lexical items. This suggests that the acquisition of morphosyntax has to wait until the child has acquired a certain amount of vocabulary. But it is one thing to say that vocabulary growth offers the opportunity for morphosyntactic development and quite another thing to claim that vocabulary size directly determines grammatical development.

### 2.4 Irregularisation

#### 2.4.1 The phenomenon

Empirical data of spontaneous child English as well as experimental results also reveal that children may apply irregular past tense (or past participle) patterns to inappropriate verbs (either irregular verbs which belong to a different pattern, as illustrated in 6 or regular verbs, as in 7):

(6) *bring-brang, think-thunk, hide-hod, bite-bot, bite-bat, bite-bet, break-brekked, say-set, fling-flang, fight-fooed, drink-dranked, see-sawn*  

(7) *Wipe-wope, trick-truck, walk-has walken, jump-janged, lift-left, crush-crooshed, trip – trippen*  

(Xu and Pinker 1995)

This led some researchers to the rather radical conclusion that children go through a stage when they irregularise all verbs or irregularise some verbs all the time:

[other] children, beginning with the regular rule, abandon it for an irregular rule which they indiscriminately apply to all verbs, only later separating out the truly irregular ones and returning to the regular rule for the rest. (Haber 1975 cited in Xu & Pinker 1995: 534).

#### 2.4.2 Possible explanations

The obvious question is how one can explain this phenomenon. Is it similar to overregularisation? What exactly leads the child to producing such irregularised forms and how does he/she de-learn it?

Various explanations of the phenomenon have been proposed. Starting from the empirical data which suggest that children extend both the regular and the irregular patterns, some linguists defend the view that both types of generalisation can be explained in a similar way (Kiparsky and Menn 1977, Kiparsky 1982). On such a view, children would overextend both regular rules, such as ‘add -ed’ and minor rules. They also go
through a stage when they consistently and systematically apply an irregular pattern to inappropriate verbs.

Kiparsky and Menn (1977) propose that a child acquiring the past tense morphology of an irregular verb goes through the following stages:

(i) the present and the past tense forms are learned separately and stored in the lexicon
(ii) the child learns the regular past tense rule and overgeneralises it to irregular verbs
(iii) the irregular past tense is relearned
(iv) the child learns an irregular pattern and overgeneralises it, creating irregularisations
(v) the correct past tense form is relearned.

The assumption is that both overregularisation and irregularisation are associated with distinct stages. Moreover, they are seen as attributed to grammatical rules. But, as discussed in 2.3, children never completely replace the usage of correct forms with overregularised ones. We expect them not to replace all the correct forms with irregularised ones either. That is why the rule-based explanation seems inadequate.

A different account is offered by connectionist models (Rumelhart & McClelland 1986, Plunkett & Marchman 1991, 1993, Sproat 1992) which assume that children make correlations between the phonological shape of the stem and that of the past tense form, which they superimpose in a pattern associator memory. When a correlation has been strengthened across a set of verbs, it will override the correlation which the child has made for the features of another verb, resulting in the overregularisation or irregularisation of the latter. On such an approach, there is no distinction between storage of regular and irregular verbs, and hence no distinction between overregularisation and irregularisation errors, which are all claimed to be caused by the same mechanism.

A third possible explanation is the one offered by the dual-mechanism model (2.2.2). Within such an approach, irregularisation is seen as the result of a retrieval failure. The irregular form has been stored in the lexicon but, due to the associative nature of memory, the phonological properties of a particular verb may overlap with those of a phonologically similar verb. When the correct irregular form cannot be retrieved, the child mistakenly applies the pattern of a similar verb. Since memory storage and retrieval depend on frequency of exposure, the child will no longer ‘irregularise’ those forms to which he has been exposed often enough to consolidate in memory and he/she will be able to retrieve it all the time.

Xu and Pinker (1995) analysed a large sample of child speech (20,000 past tense and participle usages from 9 English-speaking children from the CHILDES database) looking for what they call ‘weird past tense forms’, i.e. extensions of irregular vowel change patterns to inappropriate verbs. They only found 63 examples of irregularisation, which show that children rarely irregularise. Also, the comparison between the rate of overregularisation and irregularisation showed that the latter is lower.

The data also revealed that children do not systematically and consistently irregularise. Such errors seem to be ‘sporadic malfunctions in a system designed to suppress them, not recurring products of the system’ (p.553). However, one can notice that there is a tendency to irregularise irregular verbs more frequently than regular ones. Also, irregularisation reflects a close analogy with existing irregular patterns. This suggests that the mechanism is not free; it is constrained by the existing irregular forms.
Summarising, we can say that irregularisation, just like overregularisation, can be accounted for by appealing to the dual-mechanism model. Irregularisation does not reflect mere rule-overgeneralization, but relies on irregular forms stored in the memory.

2.5. Causes of regularisation

In this subsection we are addressing the general question of what kind of information represents input to children's inflectional system, i.e. what kind of information is relevant to generating regular/irregular inflected forms.

The literature offers three answers:

(i) children are sensitive to phonological information
(ii) children are sensitive to grammatical structure
(iii) children are sensitive to semantics.

Connectionist models propose that phonological information is the only one which determines regular and irregular inflectional patterns. Rumelhart & McClelland (1986) argue that the child will be able to map the stem to the appropriate past tense form on the basis of the phonological input alone. Pinker & Prince (1988) and Kim et al. (1991) provide evidence that for adults the phonological input is not enough. In English, there are pairs of verbs which have homophonous stem forms but different past tense forms, such as:

(8) a. Muddy rang the bell. (ring /rang)
    b. Muddy wrung the washcloth dry. (wring/ wrung)
(9) a. T-Bone lay on his bed. (lie/lay)
    b. T-Bone lied to me again. (lie/ lied)  (Kim et al. 1994: 177)

Secondly, denominal verbs uniformly take a regular past tense form, even when they happen to be homophonous with an irregular verb, as the following examples show:

(10) a. He grandstanced to the crowd. (*grandstood)
    b. He spitted the pig. (*spat)
    c. The doctor casted his leg. (*cast)
    d. He sleighed down the hill. (*slew) (Kim et al. 1994: 179)

Such data are taken as evidence that the phonological input is not enough and that irregularity seems to be rather a property of verb roots, not of verbs. If a verb has a noun root or an adjective root, it will take a regular past tense form. This is part of a more general phenomenon: the grammatical structure of a verb determines its semantic, syntactic and inflectional properties.

Some words are exocentric, i.e. they are headless. This is the case of ring in ring the city for example (or of any verb in 10 above). The whole word is labelled as a verb but it is made of a noun which cannot be its head; had N been the head, the whole word would have had the status of a noun.

(11) V
    2
    absent head N

In (11) the homophonous (irregular) form cannot percolate to attach to the whole verb. The regular -ed rule applies as a last resort.
Semantically, exocentric words generally represent extensions of meaning; but it is exocentricity which leads to treating the verb as a regular one, and not its semantics. The hypothesis Kim et al. (1994) put forth is that both adults and children are sensitive to formal grammatical structure when they have to decide whether a certain verb takes a regular or an irregular past tense form.

They tested 12 monolingual English-speaking children aged 6; 8-8; 10 and 26 children aged 3; 2-5; 2 to see if they are indeed sensitive to grammatical structure. The verbs used in the elicitation task were see, buy, meet, drink, fly, stick, write, leave, ring. Each item was used twice: once as a verb root and once as a denominal, as illustrated in (12):

(12)  a. Denominal: This is a fly. Can you say ‘This is a fly’? I’m going to fly this board. I just...
b. Verbal root: This airplane is going to fly. Can you say ‘This airplane is going to fly’? This airplane is about to fly through the air. The airplane just...

The results were consistent with the hypothesis: the children responded with regular past tense forms more often than irregular past tense forms for denominals and with irregular past tense forms more often than with regular ones for the verb roots.

Two more experiments were designed to test whether children were sensitive to grammatical structure when having to choose between regular /irregular noun plural inflection. The hypothesis would be, in this case, that only nouns with noun roots in head position can have an irregular plural form (13), while exocentric nouns will tend to have a regular plural form (14):

(13) They do not have one single child, they have two children.
(14) We’re having Julia Child and her husband over for dinner. You know, the Childs are really great cooks.

Endocentric/exocentric pairs were constructed for irregular nouns: fat man/Batman, fuzzy mouse/Mickey Mouse, little goose/Mother Goose, little child/Superchild, purple tooth/Mr Tooth, a.s.o.

The same two groups of children in the previous experiments were required to supply the correct plural form in situations of the following type:

(15)  a. exocentric nouns: This is Mr Tooth. Can you say ‘This is Mr Tooth’? (Bring out another Mr Tooth). There are two...
b. endocentric nouns: But this is a purple tooth. Can you say ‘This is a purple tooth’? (Point to another purple tooth). There are two...

The children in the two groups gave more regular plural responses for exocentric nouns than for endocentric ones. The results in the experiments show that the input to children’s inflectional systems cannot be the phonological shape of words. Children are sensitive to the grammatical structure of words. Kim et al. (1994) thus provide data in favour of the view that children’s inflectional systems are sensitive to grammatical structure, and not to phonological or semantic structure.

Lakoff (1987) or Shirai (1997) defend a different position: regularisation of denominal verbs is due to semantic extendedness. On such an approach, extended verbs are more likely to be regularised. Given that denominal verbs are extended, it is natural that they should be regularised more often than non-extended verbs. Shirai (1997) argues that speakers avoid irregular forms with denominals because they do not want to convey meanings associated with the homophonous irregular forms. The child
knows that the irregular form is associated with a certain meaning and realises that the denominal is semantically different. Consequently, he/she will opt for the regular form in order to mark this semantic difference. That means that choice of regular/irregular form depends on communicative gain in the end.

Such an approach raises at least two questions, though. It is known that communicative strategy is acquired late. Also, there are cases of ambiguity or extension of meaning when the irregular form is still the choice, as in blow someone away. Some denominals are homophonous with regular verbs and, in this case, the choice is also a regular past tense form:

(16) a. I stared at him for hours.
    b. For exercise I used to bike but now it’s so cold that I run stairs. Yesterday, I stared for an hour. (Kim et al. 1994: 200)

Denominal verbs also take a regular past tense form even when there is no homophonous irregular which could create ambiguity:

(17) She kinged the checker piece.
    My car pinged all the way home.

It would be difficult to account for all these data on a semantic approach. From the point of view of learnability, it is also desirable to adopt a grammar structure explanation:

The simplest account is that children’s linguistic systems are inherently organised to distinguish rules from lexical storage (with regular and irregular inflection associated with these two modes of producing linguistic forms, respectively), and to use head inheritance to interpret new complex words from their familiar components. (Kim et al. 1994: 204–205).

3. Derivational rules

3.1. Children are gifted creators

The examination of children’s means of deriving new words at a very early stage in their linguistic development leads to a similar conclusion as in the case of inflectional morphology: children are innovative learners. Given that the number of conventional words which they have learned is still limited, they create novel forms out of words or on the pattern of those words which they already know. Whenever they produce innovative compounds, the words are appropriately ordered as in burn-man or burmer-man, compounds used as an answer to the question: ‘What do you call someone who burns things?’ (Clark and Hecht 1982 cited in Gottfried 1997a). If asked to select a picture which best matches the meaning of a compound, they correctly choose the picture which depicts the object labelled by the head of the compound. For example, if shown three pictures: one depicting a round black bug, one a stick and the third one a bug that looked like a stick, and asked to choose the picture where they saw a ‘stick-bug’, children correctly choose the third picture (Gotttfried 1997b). As early as the age of 3, children even reject compounds which do not observe the appropriate word order, such as ‘bed-cat’ for ‘a kind of bed that cats sleep in’ (Clark and Barron 1988, cited in Gottfried 1997a).

Children seem to be extremely gifted word creators. Clark (1993) examined the detailed corpus of a child’s language development between 1; 8 – 5; 11. She found 1,351
Innovative nouns, which would roughly correspond to one new noun per day over the four-year period. For example, children can derive denominal verbs which do not exist in the adult lexicon:

(18) You have to scale it first. (= to weigh)
(19) I broomed her. (= hit her with a broom)
(20) Is it all needed? (= is it all mended?)
(21) Mummy trousers me. (= put my trousers on)
(22) I'm crackering my soup. (= put crackers…)
(23) Will you chocolate my milk? (= put chocolate….) (Goodluck 1991: 52)

Bowerman (1982) reports some innovative causatives which are rarely used in adult English:

(24) It always sweats me. (= makes me sweat)
(25) This is aching my legs. (= makes my legs ache)
(26) Enough to wish me one of those beds. (=to make me wish for…)
(Goodluck 1991: 53)

Longitudinal studies or experimental ones provide evidence that young learners can create metaphoric compounds:

(27) bird-car = airplane
    ball-beads = spherical beads
    butterfly-bugs = dragon-flies
    flower-wheels = car wheels shaped like flowers
    heart-fruit = grape shaped like a heart (Gottfried 1997a)

Such data undoubtedly show that children are able to use derivational rules creatively in order to form innovative words.

3.2 Principles of early word formation

The question is whether children are guided in their word formation development by some principles which may explain the speed and easiness with which they create new words. Clark (1993) suggests that children’s innovations reveal systematic reliance on principles of acquisition:

(i) transparency of meaning
(ii) simplicity of form
(iii) productivity.

Early compounds do not contain any changes to the form of the words which enter that compound. For example, early compounds created by English-speaking children are of the form (bare) Noun + Noun, such as the ones in (28) below:

(28) fire-dog (= dog found at the site of a fire)
    snow-tree (= fir tree, without any snow on it)
    plant-man (= gardener)
    plate-egg (= fried egg) (Clark 1991: 50)

Compounds such as boat-driver are created later, since they also contain affixes and are therefore more complex. The same simplicity-bias in early word – compounding...
has been noticed in early Dutch (29), early German (30), early Icelandic (31) and early Swedish (32):

- **(29)** *koppie-tafel* ‘coffee + table’ (= table for coffee)
  - *trem-boeken* ‘tram + books’ (= books of tram tickets)

- **(30)** *Fensterhaus* ‘window + house’ (= house made of transparent blocks)
  - *Felsenberge* ‘rock + mountains’ (= mountains made of rock)

- **(31)** *fiatabill* ‘Fiat + car’ (= Fiat)
  - *kubbabill* ‘block + car’ (= car made of blocks)

- **(32)** *simbil* ‘swim + car’ (= car that travels in water)
  - *golvkäpp* ‘floor+stick’ (= stick for hitting on the floor)

Transparency refers to the children’s bias towards using already known words, affixes and meanings, i.e. words and affixes which are already transparent to them, when creating new words: ‘the new meaning must be accessible in part from the elements making up the new word’ (Clark 1993: 115). Thus transparency refers to both familiar meaning and familiar form. See, for example, a few denominal verbs coined by 2-year-olds (reported in Clark 1982):

- **(33)** *key* (= to open with a key)
  - *needle* (= to mend, to sew)
  - *string* (= to fasten with a string)

Children often create new verbs from familiar nouns:

- **(34)** *to button* = to press the button (of a calculator)
  - *to flag* = to waive like a flag
  - *to bell* = to ring
  - *to rug* = to vacuum the rugs (Clark 1993: 117)

When they coin compound words, they tend to use familiar nouns:

- **(35)** *sky-car* = airplane
  - *crow-bird* = crow
  - *hole-sack* = sack with holes in it
  - *cup-egg* = boiled eggs (Clark 1993: 117)

Because their repertoire is not very rich yet, they may use the same noun as a head in several compounds, such as *man* (as in 36), *car* (illustrated in 37) or *bird* (as in the compounds in 38):

- **(36)** *rat-man* = man who works with rats in a lab
  - *plant-man* = gardener
  - *button-man* = man who throws buttons
  - *fix-man* = mechanic

- **(37)** *taxi-car*
  - *beach-car*

- **(38)** *parrot-bird*
  - *flamingo-bird* (Clark 1993)

Children also use familiar affixes to create new words. –*er* is often used in an innovative way when children want to denote agents of various actions:

- **(39)** *cooker* = cook (!)
  - *climber*
The principle of simplicity of form refers to the children’s tendency to make the fewest possible changes to familiar words or affixes when creating new ones. The earliest innovative compounds in corpora of child English seem to be compounds of the form bare Noun+Noun:

(40)  

\[
\text{snow-tree} = \text{fir-tree} \\
\text{fire-dog} = \text{dog found at the site of a fire}
\]

They mainly rely on roots before combining roots and affixes. The principle of productivity states that children first acquire and hence use in innovative words those forms which are the preferred ones within their speech community. When several options are transparent, the child will decide which one to use on the basis of productivity.

4. Level-ordering and morphological development

Recent theoretical proposals put forth the idea that there is an ordering of levels of rule application in the domain of morphology (Siegel 1977, Anderson 1982, Kiparsky 1982, 1983).

According to Kiparsky (1982) there are three such levels:

(i) **Level 1** which includes:
   - irregular inflection (*mice*, *went*)
   - pluralia tantum (*scissors*, *clothes*)
   - semantically unpredictable derivational affixes (of the type -*ion*, -*ous*, -*ity*, -*th*) which are not very productive and which deform their host by stress shifting and vowel reduction.

(ii) **Level 2** which includes:
   - (more) semantically predictable derivational affixes (*-ness*, -*ism*, -*er*, -*ist*, *un*) which are quite productive
   - compounding rules.

(iii) **Level 3** which includes:
   - regular inflection affixes, which are non-deforming and semantically predictable (*-s*, *-ed*, *-ing*).

Rule application is constrained by the level to which the particular rule belongs in such a way that rules at a later level, Level 3, for example, cannot apply prior to rules which belong to Level 1 or 2.

One of the most powerful predictions of Kiparsky’s level-ordering model is that regular inflection affixes will only be added to a word after derivational affixes (which belong to Level 1 or 2) have been added to the same word. That can explain why *mice-infested* is a possible compound in English, whereas *rats-eater* is not. Pluralia tantum nouns (which belong to Level 1) can also be found inside compounds: *clothes basket*.

Gordon (1985) tested for children’s knowledge of this ordering of morphological rules. His experiment is interesting from several points of view. In spite of the fact that English allows for nominal compounds in which the irregular plural form of a noun has been used (such as *mice infested*, *teeth inspection*), the examination of high-frequency
compounds with irregular plurals (Kucera and Francis, cited by Gordon 1985) reveals that there is a strong tendency for the use of the singular form: *toothbrush, mouse-trap, man-eater*. This means that the input which the child receives offers little evidence for the ordering of rules. If one can prove that children have knowledge of level ordering of morphological rules, this can provide strong evidence in favour of the existence of level ordering as an innate constraint on word formation. The developmental prediction would be that the child should produce compounds of the type *rat-infested* but not of the type *rats-infested*. The child will start using (optionally) the appropriate irregular plural form inside compounds as soon as he/she has stopped overregularisation of the irregular forms. Also, the child will start using pluralia tantum inside compounds after he/she has learned that such nouns do not have a singular form.

Gordon (1985) tested 33 three to five year old children to see if they can produce compounds of the *rat-catcher* type. The children were introduced to a Cookie Monster puppet and they were told: ‘Do you know what this is? It’s Cookie Monster. Do you know what he likes to eat? He likes to eat all sorts of things’ (Gordon 1985: 3). Then the children were shown various objects and were asked if Cookie Monster could eat the object in the picture (X). Then they were asked what they called someone who eats X. The experimenter elicited compounds of the form *teeth eater/rat eater* and *scissors eater/knife eater*.

The subjects used the correct pattern **singular noun + eater** at all ages with regular forms (even with those which the subject overregularized); when the children knew the correct irregular plural form, they used it inside the compound. The results showed that young children observe the constraints of Kiparsky’s level-ordering model.

But these constraints seem to be violated by examples of the type *publications catalogue, drinks cabinet, weapons analysis, Parks Commissioner, Human Services Administration, programs co-ordinator, buildings inspector, letters policy, equal rights amendment, American cars exposition*8. On the one hand, the plural tends to be associated with an idiosyncratic meaning inside these compounds. For example, *programs* in *programs co-ordinator* leads to the interpretation of the compound as « co-ordinator between programs », whereas *program co-ordinator* is interpreted as « co-ordinator of one single program (Alegre and Gordon 1996). *Drinks*, in *drinks cabinet*, can only denote alcoholic drinks (Gordon 1985). On the other hand, even if the meaning of the plural form inside the compound were not idiosyncratic, such examples would not provide real evidence against the level-ordering model, since we are still faced with the question of why regular plurals cannot be used in most compounds.

Kiparsky suggested that the compounds which contain a regular plural are formed through a recursive procedure: the regular affix attaches first and then the output enters compounding at a later stage.

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8 Selkirk (1982) used such examples as an argument against the level-ordering model.
A compound of the type red rat eater can be generated as in (41a) or as in (41b):

(41)  
\[ \begin{array}{ll}
\text{a. } & \text{NP} \\
& 2 \\
& \text{Adj} \quad \text{N (compound)} \\
& 2 \\
& \quad \quad \text{N} \quad \text{N} \\
& \quad \text{red} \quad \text{rat} \quad \text{eater} \\
\text{b. } & \text{N (compound)} \\
& 2 \\
& \text{NP} \quad \text{N} \\
& 2 \\
& \text{Adj} \quad \text{N} \\
& \text{red} \quad \text{rat} \quad \text{eater}
\end{array} \]

In (41a) the compound rat eater was formed first and the reading of the whole compound is « eater of rats which is red ». In (41b) recursion has applied and the compound was formed at the last stage. The reading of this compound is «eater of red rats».

When the plural form of the noun is used, the compound can only be generated through recursion (as in 42b). In this case, (42a) is impossible:

(42)  
\[ \begin{array}{ll}
\text{a. } & \ast \text{NP} \\
& 2 \\
& \text{Adj.} \quad \text{N (compound)} \\
& 2 \\
& \quad \quad \text{N} \quad \text{N} \\
& \quad \text{red} \quad \text{rats} \quad \text{eater} \\
\text{b. } & \text{N (compound)} \\
& 2 \\
& \text{NP} \quad \text{N} \\
& 2 \\
& \text{Adj} \quad \text{N} \\
& \text{red} \quad \text{rats} \quad \text{eater}
\end{array} \]

The presence of a regular plural inside the compound represents positive evidence for a recursive compound and hence it blocks the non-recursive interpretation. Red rats eater can only be interpreted as «an eater of red rats». When there is no overt signal of recursion, both interpretations are allowed but the non-recursive one is preferred.

Alegre and Gordon (1996) tested this hypothesis with 36 children (aged 3; 4 – 5 years) with the aim of finding out whether children at this stage have knowledge of recursion. During a pre-test, the experimenters tested the subjects’ knowledge of colours. In the test, the children were presented four pairs of pictures, each depicting a creature eating some smaller creatures (a monster eating rats, a cow eating flowers, a monster eating spiders and a fish eating crabs). Half the children were assigned to the singular condition and the other half to the plural condition. Then, the children in the
singular condition were asked: ‘Can you point to the picture which shows a red rat eater?’ while being shown two pictures: one depicting a red monster eating blue rats, and the other one depicting a blue monster eating red rats. The children in the plural condition were asked: ‘Can you point to the picture that shows a red rats eater?’ while being shown the same set of pictures.

Throughout the experiment care was taken to use even stress, so subjects would not be led to one reading or the other.

Children in the singular condition tended to interpret the compounds as not involving recursion. The ones in the plural condition tended to interpret the compounds as containing a NP, i.e. as having been generated recursively. This supports the hypothesis that young children (aged 3–5 years) distinguish between compounds with a plural noun (inside) when fronted by an adjective. Alegre and Gordon’s experiment continues the experiment of Gordon (1985) and provides evidence that while disallowing regular plurals inside compounds, children know that regular plurals are allowed when they are preceded by an adjective. They interpret the adjective as part of the NP constituent inside the compound, which supports the hypothesis that in this case the compound has been generated through recursion.

Unfortunately, the problem of compounds is more complex. Alegre and Gordon’s experiment leaves the problem of the acquisition of compounds of the type publications catalogue unsolved. They admit the limits of their analysis: ‘Even if we stay within English compounding, the problems remain extremely complex and difficult to account for in terms of acquisition. In the present study, we have examined only one kind of exception to the no-plurals-inside-compounds generalisation: those fronted by adjectives. But this does not exhaust the exceptions list’. (P.77)

The literature offers further evidence that regulars and irregulars are treated differently in the grammatical system at a very early phase. This time, evidence comes from early German. Clahsen et al. (1992) studied the acquisition of German noun plurals in relation to the question of how children treat the plural forms within compounds. In German, the plural form of nouns is determined, to some extent, by gender and morphophonological characteristics. Feminine nouns ending in -e form the plural with -n: die Strasse – die Strassen. But there are many exceptions and the input which the German-speaking child receives is very uninformative about which is the regular plural:

(43) der Daumen – die Daumen (thumb/thumbs): 0
die Mutter – die Mütter (mother/mothers): 0 + Umlaut
der Hund – die Hunde (dog/dogs): -e
die Frau – die Frauen (lady/ladies): -(e)n
der Wald – die Wälder: -er
das Auto – die Autos (car/cars): -s

All these plural morphemes are present in early German, but very often they are not used correctly. Many children tend to use 0, -n or -s when they do not know the appropriate plural. The fact that -s is also used in adult language for borrowings or newly created words made some linguists consider that -s is the default form for the plural of nouns in German. -s is a Level 3 inflection, unlike the other plural affixes, which belong to Level 1 or 2:

Level 1: irregular inflection - 0, -e, -er and irregular plurals
Level 2: -n plural and compounds
Level 3: regular inflection and default -s plural (Wunderlich 1986, cited in Clahsen et al. 1992)
Given that the -s plural form belongs to Level 3, the prediction is that plural -s forms cannot occur inside compounds.

Clahsen et al. (1992) examined the Simone corpus (1; 7 – 3; 9 years) (CHILDES, MacWhinney and Snow 1989) in an attempt at finding out if German children have tacit knowledge that regular affixes cannot be used inside compounds. Simone does not often overgeneralise the ‘regular’ plural morpheme, but, when she does, she uses –s as the regular/default form:

(44) manns (=Männer) (men)
lopers (= Pullover) (pullovers)
wauwaus (dogs)
lalas (pacifiers) (Clahsen et al. 1992:238)

In the 71 compounds found in the corpus the plural -s never appears, though, in spite of the fact that other plural morphemes are used:

(45) schweinehirt (pig herdsman)
bilderbuch (picture book)
bananenquark (banana cottage cheese)
katzentatze (cat paw) (Clahsen et al. 1992:239)

The data in the Simone corpus show that, in spite of the fact that all the different types of plural endings were active, the default form was, in this case, -s. The 71 compounds which exist in the corpus do not contain any plural -s form, not even when the non-head is a noun which takes an -s plural form:

(46) autobahn ‘highway’
gummihose ‘plastic pants’ (Clahsen et al. 1992: 239)

With some other children the default form is -n. The examination of their compounds led to the expected results: they did not use the default form in their compounds.

These empirical findings provide evidence in favour of Kiparsky’s level-ordering hypothesis. In German, adult/child language does not allow -s plural forms within compounds. Clahsen et al. suggest that Kiparsky’s hypothesis requires an additional condition on affixes: ‘default (regular) affixes cannot serve as input to compounding processes’ (p. 226).

SUMMARY

In this chapter a few questions related to the morphological development of children were addressed. It has been shown that the acquisition of regular and that of irregular forms represent two different mechanisms: regular inflection is linked to specific rules and representations of the computational component, whereas the acquisition of irregular forms relies on an associative memory system.

Children tend to overgeneralise the regular pattern of inflection to irregular forms and to extend an irregular pattern of inflection to other regular forms because, for memory reasons, they cannot retrieve the appropriate form stored in the lexicon.

It has also been shown that choosing a regular or an irregular pattern of inflection for a new lexical item is mainly determined by the grammatical structure of words.
Children seem to have tacit knowledge of the ordering in which morphological rules can apply and they create or interpret compounds accordingly. In particular, they can distinguish between regular (or default) and irregular morphology.

Experimental data have been used as evidence that children are not rote learners of (inflectional or derivational) morphology and that, in the creation of new words, they are guided by more general principles.

**Further Reading**

*Focussed*: For more about the way in which children use innovative words, read Clark (1993).

*Advanced*: If you are willing to find out more about the acquisition of morphology and the link between the formation of Noun-noun compounds and complex-predicate formation read Snyder (1995).

*Textbooks*: If you want a concise introduction to morphological development in another textbook, read Chapter 3 in Goodluck (1991).