On the acquisition of inflectional morphology: introduction

Wolfgang U. Dressler

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Acquisition of inflectional morphology has been investigated for the purpose of delivering external or substantial evidence for theoretical problems of morphology, similarly to other linguistic domains, since Baudouin de Courtenay (1974, posthumously) and Jakobson (1941, 1977). In the last two decades this area has been dominated by controversies between dual-route and single-route models of the acquisition of inflection (cf. Clahsen 1999; Clark 2003, pp. 207–212; Dąbrowska 2008).

Radical proponents of dual-route models (e.g. Pinker 1999; Pinker and Ullmann 2002) assume that any regular inflectional form is computed in the grammar by a single rule that productively combines a base with an affix (e.g. English regular weak past tense forms with the affix /d/). In order to produce a regular form for a given category, a language has just one affix (e.g. English gerundive *-ing*), as is typically the case in agglutinating languages, or it has one default operation (e.g. in the English past tense). All non-default forms, called irregulars, are stored and acquired like any other words of the lexicon. New irregular forms (e.g. E. *brung* for *brought*) are formed via analogy to stored forms (e.g. forms like *sung*). This has been a return to traditional views on regular vs. irregular inflection, whereas in earlier generative grammar there was a tripartition between major rules (regulars), minor rules (subregulars like *sing*, *sang*, *sung*) and truly irregular, stored forms (such as *brought*, *went*). This distinction between subregular and irregular morphology can easily explain why many English children produce forms like *brung* (by overgeneralising not only regular but also subregular patterns), but have never been recorded to overgeneralise truly irregular forms, e.g. by forming past participles **sought*, **stought* to *sing*, *sting* on analogy to *bring*, *brought*.

W. U. Dressler (✉)
Department of Linguistics and Communication Research,
Austrian Academy of Sciences, Vienna, Austria
e-mail: wolfgang.dressler@univie.ac.at

Surprisingly the distinction between rules and storage and a default-seeking mechanism are the only truly morphological principles of Universal Grammar that have been advanced and investigated as innate in generative acquisition studies, in great contrast to syntax where generative acquisition studies in postulated innate principles abound. Moreover a contrast between rules and analogy is made also outside grammar in developmental psychology (Sloman 1998; Hahn et al. 2010), and there is no good reason why grammatical defaults should be essentially different from general default seeking in human behaviour, i.e. grammatical defaults could be learnt grammaticisations of a common cognitive disposition. Thus there is a lacuna to fill in generative investigations of morphological acquisition. Finally it should be noted that some syntactic acquisition studies on root/bare infinitives used instead of finite forms employ loose default concepts (e.g. Salustri and Hyams 2003) that lack the rigorous criteria used in theoretical morphology (e.g. Fraser and Corbett 1997) and in dual-route models (e.g. Marcus et al. 1995; Clahsen 1999).

Less radical versions of dual-route models either allow an overlap between the domains of rules and of storage (e.g. the race model in Baayen et al. 1997) or more than one default pattern (Sonnenstuhl-Henning 2003; Clahsen 2006). However it is unclear how this can handle inflection systems (such as Polish noun inflection described by Krajewski et al., this volume) where many productive inflection classes compete without any clear default (cf. Dressler 1999; Dressler et al. 2006). Dual-route models are assumed in this issue by Stavrakaki, Koutsandreas and Clahsen and by Marshall and van der Lely.

Radical versions of single-route models are usage-based models that deny any concept of rules or abstract patterns and conceive of morphological development as due to lexical analogies within networks. Many connectionist ones are devoid of interest in morphological theory (e.g. McClelland and Plaut 1999).

This disinterest in morphological theory is not true for schema-based models which assume concrete morphological patterns with a core and gradual boundaries, as in Bybee (1995) and Köpcke (1998), who even allows for rule formation as a final step in case of precise and productive schemas (Köpcke's model is discussed in the contribution of Korecky-Kröll et al. in this volume). Another variant of less radical single-route models includes also elements of Construction Grammar, such as Krajewski et al. in this volume.

Among models intermediate between dual- and single-route models, the contribution by Korecky-Kröll et al. to this volume assumes a gradient scale of productivity from fully productive to fully unproductive and isolated patterns, and that the mental lexicon takes as much advantage as possible both of patterns or rules and of lexical storage. What Libben (2006, p. 6) says about compounds holds for inflection as well (cf. Laaha et al. 2006; Korecky-Kröll et al. 2009):

It seems that the human mind does not seek to maximize efficiency, by either computing less or storing less. Quite to the contrary, the mind seeks to both store and compute as much as possible. If a compound word has been presented often enough so that it can be lexicalized, it is stored as a representation that can be retrieved as a whole. This, however, does not shut down the

process of morphological decomposition for that word, nor does it sever links between the whole compound word and its constituent morphemes.

This special issue is cross-linguistic but typological only insofar as Polish noun morphology, Greek verb morphology and Sesotho morphology represent rather strongly inflecting-fusional inflection systems, French verb and German plural inflection weaker inflecting-fusional systems, whereas English inflection is weakest inflecting-fusional (for much more typological variety see the volumes by Slobin 1985–1997; Bittner et al. 2003; Stephany and Voeikova 2009). Therefore a few more remarks on the relation between language typology and first language acquisition are in order (more in Dressler 2008).

Acquisition of inflectional morphology starts later than lexical, phonological and syntactic acquisition, but earlier than acquisition of derivational morphology (except for early emerging diminutives and/or hypocoristics, cf. Savickiene and Dressler 2007). The relatively late emergence of inflection might be derived from its less essential character, in view of the existence of isolating languages lacking inflection. Typologically, the existence of inflection implies the existence of word formation in a language, but this is not reflected in the relative chronology of the emergence of inflectional and derivational morphology (for compounds cf. Dressler et al. 2010). The emergence of word formation, i.e. the detection of word formation patterns by children, is driven by lexical development (Marchman and Bates 1994; Marchman and Thal 2005), insofar as a critical mass of pertinent words must be acquired by rote for allowing the detection of a common morphological pattern. This is also a presupposition for the rise of inflection (cf. Devescovi et al. 2005), but at the same time the development of inflection is also driven by the development of syntax, especially the rise of contextual or prototypical inflection, such as case inflection. Diminutives, however, emerge early for pragmatic reasons. Another typological criterion pertinent for the speed of acquisition is morphological richness: great morphological richness of strongly agglutinating and strongly inflecting-fusional languages stimulates children more to acquire morphology than weakly inflecting-fusional languages (Laaha and Gillis 2007).

Another cross-linguistic difference cross-cuts typological differences: the property of having a richer inflection system either in noun or verb morphology, which has an impact on the acquisition process, because greater richness stimulates the child to focus on the acquisition of the richer system (Küntay and Slobin 2001; Laaha and Gillis 2007). Among the languages represented in this issue, Polish and German have a richer nominal inflection, the others a richer verbal system.

Lexical and syntactic dependence of the emergence and development of inflectional patterns must be kept in mind when interpreting the relative success of children in acquiring them in the contributions to this issue. This regards, first of all, type and token frequency of acquired patterns as depending of frequencies in children's inputs (cf. Naigles and Hoff-Ginsburg 1998), i.e. in child-directed speech of children's care-givers (but not in corpora of adult-directed adult speech, cf. Ravid et al. 2008). In addition, there are other factors which influence order of acquisition of inflectional patterns and correctness of productions (cf. Clark 2003, pp. 191–194).

The first is formal complexity of an inflectional marker (Clark 2003, pp. 191–193). Less complexity allows earlier acquisition. This factor can be split up for inflection into:

1. Degree of reliability (in the semiotic sense of Morris 1971): biunique relations between form and meaning are most reliable (cf. Slobin 2001; Dressler 2008), e.g. the English superlative suffix *-st* is biunique, because it only expresses the superlative and the superlative is expressed morphologically only by the suffix *-st*, whereas all the other English inflectional suffixes are more complex in being unique (e.g. the gerund is expressed only by *-ing*, acquired early, but *-ing* expresses also nominalisation) or mostly even ambiguous.
2. Transparency: e.g. umlaut in Germanic languages opacifies plural formation and contributes to later acquisition and more errors.
3. Iconic affixation is earlier acquired than less iconic ways of marking inflectional categories.

A second factor is relative salience of an inflectional marker. Due to the bathtub effect (the combination of primacy and recency effects, cf. Demaree et al. 2004) which favours the perception of the periphery of a word, a child identifies more easily peripheral prefixes and suffixes than more internal markers. Thus case forms emerge earlier in agglutinating languages, because they are expressed by a separate suffix after the plural suffix (Stephany and Voeikova 2010). For young children the recency effect is more important than the primacy effect (Griffin 2002; Kirk and Demuth 2005), one reason for the suffixing preference.

A third factor is productivity of a pattern, not to be equated with frequency (Laaha et al. 2006).

Stages or phases in the acquisition of inflection are at least rote-learning of isolated inflectional forms, first analogies and rule learning (called “combination” by Mac Whinney, cf. Clark 2003, pp. 193–195). This, approximately corresponds to the phases (Dressler 2008; Bittner et al. 2003) premorphology, protomorphology, when a child detects the (de)composition of complex morphology in meaning and form, core morphology (Ravid et al. 2008), which initiates adult-like morphology proper. Still finer distinctions have been elaborated in Berman’s (2008) developmental steps: rote-knowledge, initial alternations, interim schemata, rule-knowledge, full mastery. The typically developing children investigated in the contributions to this volume are generally in the third and fourth step (earlier in Clark and de Marneffe’s paper).

The term typical development has replaced terms like normal development, because it contrasts with the tedious term “abnormal”, and because there are few general norms in typical development, i.e. there is much early variation (Marchman and Thal 2005): late developers/talkers experience different courses of development than early bloomers, furthermore one can distinguish referential, prosodic children etc. However, these early differences largely equalise by Berman’s fourth step or in core morphology.

For types of atypical or disordered development (Schwartz 2008) the fundamental question for each of them is, whether we should attribute it to general delay, asymmetric delay (e.g. typical lexical development vs. delayed grammatical

development) or impairment, and which aspects of grammar are most vulnerable. Where grammar theory comes into play is in the identification of deviance within a modular view of language: is deviance basically of a cognitive or of a grammatical nature (external modularity). Do some children fare better with rules or with lexically stored inflectional forms? Or is a specific linguistic submodule or the interface between specific submodules attained (internal modularity). Since morphology has a central position within internal modularity, such questions are relevant for theoretical positions about internal subdivisions and interfaces of morphology, irrespective of whether one subscribes to a strictly modular view or rather assumes different components with gradual transitions between them.

A final topic I want to air, which is important both for phases of typical development and its distinction from atypical ones, is the gradual increase in language awareness during development. It is clear that the amount of language awareness increases with age (Karmiloff-Smith 1992; DeKeyser 2003; Ravid and Hora 2009). Most language awareness or explicit knowledge is needed in formal test situations, such as when producing inflectional word forms on the basis of a given stimulus or when judging the correctness of a given inflectional form (cf. Blom and Unsworth 2010). Performing such tasks is much more error-prone than the spontaneous production of comparable forms in daily mother–child interaction. Therefore more errors, occurring even later, are to be expected in formal test results than in longitudinal corpora of spontaneous child productions (which are based on implicit knowledge). And again, even more errors occur in testing atypically developing children.

The six contributions to this issue relate to the following topics:

Clark and de Marneffe (Stanford University), based on two longitudinal corpora of mother–child interaction, study how two French-acquiring Swiss children learn to disambiguate the homophonous forms of the infinitive and past participle of the only productive French verb class (e.g. *tomber* ‘to fall’ = *tombé* ‘fallen’) due to constructions adults use in their child-directed productions (especially reformulations of virtually or actually ambiguous child productions). Neither regularity nor default appear to be helpful notions for this purpose.

Demuth and Weschler (Brown University) show, based on longitudinal corpora of three children, that they acquire the (generally transparent) gender prefixes of the Southern Bantu language Sesotho and nominal gender and plural agreement easily and with few errors, although prefixes are many and sometimes homophonous and compete with a zero prefix. Errors are few and occur particularly in case of ambiguity. Acquisition of prefixes proceeds from omission over optional use of fillers (unspecific place-holders) to correct prefixes.

Krajewski, Lieven and Theakston (University of Manchester and Max Planck Institute for Evolutionary Anthropology, Leipzig) analyse Polish case forms in a dense corpus recorded over 6 weeks, i.e. in a very large data set of one point in the acquisition process of a two-year old girl (corresponding to Berman’s third developmental step). Using innovative statistical methods the authors compared the input and output and found a surprisingly great success of the child in acquiring the rich declensional system of Polish at a very early age, however with less productivity (i.e. a lexically more restricted use) than appears in the adult input to the child.

Korecky-Kröll, Libben, Stempfer, Wiesinger, Reinisch, Bertl and Dressler (Austrian Academy of Sciences, University of Vienna & University of Calgary) performed an online well-formedness judgment test of German noun plurals with Austrian children from 6 to 10 years and of adults. These children were quite able to distinguish between actual, non-existing potential and non-existing illegal plurals, a distinction which appeared much earlier in spontaneous longitudinal data. Additional umlaut in *-e* plurals appears to be favoured as a useful redundant cosignal of plurality, as well as high degree of productivity.

Marshall and van der Lely (University College London & École Normale Supérieure, Paris) compared children and adolescents suffering from Grammatical Specific Language Impairment (G-SLI) with three age groups of typically developing children (TD) in an elicitation task of producing irregular English past tense forms. Results were found to be compatible with van der Lely's recent Computational Grammatical Complexity model which evaluates the degree of syntactic, morphological and phonological complexity in their interaction in the formation of past tense forms. G-SLI subjects are impaired syntactically (less tense marking), morphologically (less overgeneralization of regular past tense formation, i.e. impairment of the rule component) and phonologically.

Stavarakaki, Koutsandreas and Clahsen (University of Thessaloniki & University of Essex) study SLI vs. TD in the much richer system of Greek perfective past tense (aorist) formation, also using nonsense verbs, in a picture naming task. They apply the dichotomy of regular vs. irregular verbs to Greek identifying productive sigmatic aorists as regular, asigmatic ones as irregular. Both TD and SLI were more accurate in regular past formation. But SLI overrelied on asigmatic forms, whereas in an earlier study the authors had found that Williams syndrome children overrelied on sigmatic forms. Thus SLI are concluded to have a morphological (but not a syntactic) impairment in the rule system. Therefore, despite their similar outlook, the two SLI contributions to this issue arrive at different conclusions.

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