Syncretism

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7.1 Introduction

One of the most basic tasks of morphological analysis is to account for patterns of syncretism—that is, cases in which the same phonological string is used to express distinct combinations of morphological features. For example, although in principle languages may distinguish between at least three numbers (singular, dual, plural) and three persons (1st, 2nd, 3rd), most German verbs show only four distinct surface present tense forms to mark nine logically possible combinations, as shown in Table 7.1 for the regular verb legen 'put'.

The forms in Table 7.1 illustrate two different ways in which morphological distinctions may fail to be realized. On the one hand, dual forms are always identical to plural forms in German, not just in the present tense paradigm of regular verbs, but for every verb class in every tense and mood. In this case, there is no evidence that the dual/plural distinction is morphologically active in German, a fact that we might plausibly wish to express by eliminating the morphosyntactic feature(s) for dual from German morphological representations at some very deep (possibly syntactic) level. On the other hand, the fact that the 1pl and 3pl are identical (legen) cannot be reduced to a lack of distinctions between first and third person forms, since a distinction is clearly evident in the singular (1sg lege vs. 3sg legt). Likewise, the fact that the 3sg and 2pl are both pronounced legt cannot be reduced to a general lack of 2nd/3rd or singular/plural distinctions in the language, but instead appear to be contextually restricted: the 1st person and 3rd person are identical only in the plural, and 3sg and 2pl are identical only in the present tense of regular verbs. (Further details of the relation between person marking and tense will be discussed in section 7.2 below).

The proper theoretical response to such identities is not always obvious. At one extreme, one may be tempted to dismiss them as coincidental—a not wholly implausible response, given that homophony is pervasive in language. (An arguably different -en suffix is also used for noun plurals and as a linking element in compounds, while another suffix -t is used to mark past tense in regular verbs.) At the other extreme, one may seek to minimize accidental homophony by reducing as many phonological identities as possible to morphological identity (Müller 2006b, c). It is almost certainly the case that some instances of syncretism reflect accidental homophony, while others reflect identity at a deeper morphological level. In this chapter, we survey the sources of evidence that are relevant in determining whether a given instance of syncretism is morphologically significant, along with a set of theoretical mechanisms that have been proposed to analyze true (non-accidental) cases of syncretism. We then illustrate the strengths and weaknesses of these mechanisms in section 7.2 with in-depth discussions of several cases of syncretism.

It is important to note from the outset that we use the term 'syncretism' to refer to any case of identity between forms that realize distinct morphosyntactic feature combinations. This includes whole-word syncretism, such as the case of German 1pl/2pl legen or 3sg/2pl legt. It also includes partial syncretism, where two forms share a suffix or root allomorph but are not wholly identical. For example, the German verb tragen 'carry' has a distinct root allomorph träg- in the 2sg and 3sg. As a result, the 3sg (trägt) shares the same form of the root as the 2sg (trägt) and the same suffix as the 2pl (trägt-e), but is distinct from both at the level of the entire word. Although the term syncretism is sometimes reserved to refer to identity of entire inflected forms (e.g. Baerman, Brown, and Corbett 2005: 7–9), we use it to refer equally to identity at the level of entire words or of individual morphemes. Most of the theoretical mechanisms we consider below concern approaches to deriving the distribution of individual morphemes, and the distinction between whole-word and partial syncretism is of no particular theoretical relevance in a morpheme-based framework.

In addition, it is worth noting that although the discussion below relies on detailed consideration of a small set of cases selected for the amount of supporting morphological and syntactic evidence that they provide, the mechanisms we discuss must also be confronted with a full range of typological evidence, including data from languages that make very different morphological distinctions. An extremely valuable resource in this pursuit is the Surrey Syncretisms Database, and a detailed description of the major trends that can be observed is found in Baerman et al. (2005). In section 7.3, we present a selection of relevant phenomena, focusing on morphological polarity effects, instances of directional syncretism, and the relationship between syncretism and portmanteau expression.

### Table 7.1. Syncretism in German present tense verb inflection

<table>
<thead>
<tr>
<th>SINGULAR</th>
<th>DUAL</th>
<th>PLURAL</th>
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<tbody>
<tr>
<td>1ST</td>
<td>leg-e</td>
<td>leg-en</td>
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<tr>
<td>2ND</td>
<td>leg-st</td>
<td>leg-t</td>
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<td>3RD</td>
<td>leg-t</td>
<td>leg-t</td>
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7.1.1 Morphology-Internal evidence

An importance source of evidence that the connection between the 1pl and 3pl in German is linguistically significant comes from the fact that these two forms are always identical, even when they are not marked with the suffix -en. For example, the verb sein 'to be' is suppletive in more present tense forms, and is sein in both the 1pl and 3pl (distinct from the infinitive). This suggests that identity between these forms is not just a coincidental sharing of -en, but rather reflects a deeper fact about the language (Williams 1981: 266–9, Carstairs 1987: 94). This situation, in which the same identity is seen across multiple inflectional classes regardless of the individual morphemes involved, is sometimes referred to as metasyntactism (see also Carstairs 1987, Bobaljik 2002, Frampton 2002, Harley 2008).

Metasyntactisms that hold across all inflectional classes are a powerful source of evidence that we are observing something more systematic than a coincidental surface identity. A frequently discussed example comes from Latin (Williams 1981, 1994), in which the dative and ablative plural are identical in all inflection classes, regardless of their specific realization (cf. the shaded lines in Table 7.2). Carstairs (1987: 93) summed up the usual conclusion succinctly: "It is reasonable to conclude that we are dealing with something systematic and genuinely part of what the native Latin speaker 'knew', not a linguist's construct or a mere accidental homonymy between two cases forms. (At the very least, the onus of proof is on the linguist who wants to contend otherwise.)"

There are two features of the Latin dative/ablative plural that make it a compelling example. The first is that the identity holds across several different realizations of the relevant suffix (-i, -ius, -iis). Moreover, the identity is exceptionless: there are no inflection classes or irregular lexical items in which the two forms are distinct. In the case of German, the identity of the 1pl/3pl -en is also metasyntactic: as mentioned above, the 1pl and 3pl forms are identical for every single verb in the language, sharing the same stem allomorph and the same suffix, even in highly irregular or suppletive verbs such as sein 'to be': sind 'be.PRS.1PL/3PL'. Thus, the heuristic of metasyntactic would support treating the 1pl/3pl identity as systematic.

Evidence from metasyntactic can be especially important in cases of syncretisms that involve featurally disparate sets of items. For example, in 1991: 119–21) discusses the distribution of gender agreement markers in the Northeast Caucasian language Khinalug, shown in Table 7.3. Among the first series, we see that the singular agreement marker for the third gender (b-) is identical to the plural agreement marker for genders one and two (also b-). On the face of it, genders 1/2 plural and gender 3

| Table 7.2. Metasyntactism of Latin dative and ablative plural |
|----------------|----------------|----------------|
| 'var' | 'love' | 'leader' |
| 'bird' | 'hand' | 'thing' | 'T' | 'you' |
| NOM SG | stella | servus | ducis | (ducis) | avis | manus | res | ego | tu |
| DAT SG | stelle | servo | duci | avi | manui | rel | mini | tibi | |
| ABL SG | stelle | servo | ducis | aves | manis | rei | mina | tibi | |
| NOM PL | stella | servit | ducis | aves | manis | res | nis | vos | |

| Table 7.3. Gender marker syncretism in Khinalug (Corbett 1991: 119–21) |
|----------------|----------------|
| Gender | Series 1 | Series 2 |
| | SG | PL | SG | PL |
| I | Ø | b- | j | v- | h | f |
| II | z | b- | z | v- | s | f |
| III | b- | Ø | v | j | f | h |
| IV | Ø | Ø | j | j | h | h |
singular do not form a natural class of contexts, and we might be tempted to treat this as a case of accidental homophony. However, comparison with series 2 and 3 shows that this is a recurring (metasyntactic) pattern in Khinalug, which may lend support to an analysis that treats the identity as meaningful.

The identity between the 3sg and 2pl in the German present tense likewise involves two featurally dissimilar forms. In the case of Khinalug, the identity proved to be most restricted than the 1pl and 3pl identity: the 3sg and 2pl are sometimes distinct due to stem allomorphy (brag-te 'carry-3sg' vs. brag-t 'carry-3pl'; ha- 'have-3sg vs. hab-t 'have-2pl'; hät 'hold-3sg vs. hait 'hold-2pl'), suffixal differences (kann-Ø 'can-3sg vs. kön-t 'can-2pl'), or suppletion (ist 'be.3sg' vs. sein 'be.2pl'). They are also distinct in other tenses, such as the simple past (seg-t-te 'say-PAST-3sg' vs. seg-t-er 'say-PAST-2pl'), whereas the 1pl and 3pl are identical in all tenses and moods. (The analysis of this difference between tenses will be discussed in greater detail in section 7.2.) The fact that the 3sg/2pl identity is seen for just one set of affixes, and even there, it breaks down in certain tenses and in certain inflectional classes, might lead us to question whether this identity is accidental rather than systematic.

Unfortunately, although exceptionless metasyntrecism is a useful indication that a particular instance of synerccism is likely to be systematic, it seems unlikely that they are either a sufficient or necessary precondition to analyzing a particular instance of identity as morphologically significant. On the one hand, there is of course no guarantee that just because the same identity occurs multiple times within the same language, that it is too much of a coincidence to be accidental. One could well imagine a situation in which a recurring metasyntrecism had arisen for historical reasons (for example, if the ablative singular happened to be borrowed or innovative), but speakers were nonetheless forced to accept it as synchronically coincidental. Conversely, there appear to be cases in which a metasyntrecism is not exceptionless, but is nonetheless pervasive enough to appear systematic. For example, the Latin vocative and nominative are identical for all inflection classes in the plural, and for all inflection classes but one in the singular (the only exception being second declension masculine nouns in -us: nominative Marcus, vocative Marcus). The fact that the vocative is occasionally morphologically distinct from the nominative in the singular but is never distinct in the plural does not normally seem to be taken as evidence that nominative-vocative metasyntrecism is systematic only in the plural. To this may also be added the fact that in many cases, a metasyntrecism appears to be meaningful but the language does not provide corroborating evidence from multiple inflection classes of a systematic metasyntrecism. Thus, we conclude that although metasyntrecisms are a useful heuristic in helping linguists to establish that a particular identity is significant and non-accidental—and may even serve as evidence to learners that the same morpheme is involved—they cannot be the only means by which we determine what constitutes a 'true' (non-accidental) metasyntrecism.

### 7.1.2 Syntactic evidence

The literature on feature agreement and mismatches provides a testable diagnostic for linguistically significant metasyntrecism. Pullum and Zwicky (1986) provide a simple example: in 'ordinary' cases of coordination, a sentence containing a coordinated element must be compatible with each the conjuncts independently; thus, a sentence such as (1a) is fine because He's a Republican and He's proud of it are both grammatical, whereas the sentence in (1b) is ungrammatical because Proud of it was elected president is ungrammatical (Sag, Gerald, Wasow, and Weisler 1985).

1. a. He's a Republican and proud of it.
   b. *A Republican and proud of it was elected president.

The same condition can be seen to hold in (2a), where neither form of the verb 'to be' is compatible with both members of the coordinated phrase either you or I, and the result is judged awkward or ungrammatical. When verb forms are the same for both members, however, as with 2sg and 3pl are, coordination is unproblematic (2b).

2. a. Either you or I am right.
   b. Either you or they are right.

Similar examples have been observed for syncretic nominal forms satisfying different case requirements of multiple predicates in coordination (Zaenen and Karttunen 1984, Pullum and Zwicky 1986, Citko 2015), free relatives (Bresnan and Grimshaw 1978, Groos and van Riemsdijk 1981, Harbert 1983, Ingrin 1990, Vogel 2001), or different gender agreement (Eisenberg 1973, Zaenen and Karttunen 1984, Pullum and Zwicky 1986). For example, Citko (2015) points out that it is impossible to do across-the-board extraction of wh-elements from coordinated structures when the two predicates assign different cases, if the relevant wh-pronoun would be distinct for the cases in question. For example, the Polish verb lubi 'love' assigns accusative case while the verb niemawdzi 'hate' assigns genitive case. Since the case forms of co 'what' are distinct for the accusative and genitive (cf. Table 7.4), wh-extraction is impossible in sentences like (3a), since the pronoun cannot satisfy the case requirements of both conjuncts simultaneously. The accusative and genitive forms of kto 'who', on the other hand, are syncretic, and the equivalent sentence (3b) is judged to be acceptable.

3. a. *Czego/Co Jan niemawdzi a Maria lubi? what.gen/what.acc Jan hates and Maria loves
   b. Kogo Jan niemawdzi a Maria lubi? who.gen/acc Jan hates and Maria loves

In a similar vein, case syncretism seems to resolve relative cases in free relative clauses. It is a well-known fact that the wh-element introducing free relatives must satisfy the

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<th>Table 7.4. Case syncretism in Polish wh forms</th>
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<td>'who'</td>
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<td>NOM</td>
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<td>ACC</td>
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<td>GEN</td>
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case requirements of both the matrix and the embedded predicate (case matching; cf. Groos and van Riemsdijk 1984). Compare the following examples from German:

(4) a. Ich nehme, wen du mir empfehle.
    I take who.acc you recommend
    'I will take who you recommend to me.'

b. Ich nehme, wer dich überzeugt hat.
    I take who.nom you.acc convinced has
    'I will take who has convinced you.'

In (4), the matrix predicate nehmen 'to take' selects an accusative object. As indicated by the contrast between (4a) and (4b), it seems that a free relative is only licensed as a direct object if there is no conflict between the case requirements of the matrix and embedded predicate (i.e. the morphological case of the wh-element). However, the fact that (5) is fully grammatical—despite a mismatch in abstract case features—shows that case mismatches with free relatives can be resolved by case syncretism (as shown in Table 7.5, the nominative and accusative forms of the neutral wh-pronoun was are identical in German).

(5) Ich nehme, was dich überzeugt hat.
    I take what.nom you.acc convinced has
    'I will take what has convinced you.'

The analysis of how syncretic case or person/number forms can satisfy multiple syntactic requirements simultaneously is an area of much debate (see especially

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<th>Table 7.5. Case syncretism in German wh-pronouns</th>
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<td>NOM</td>
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<td>ACC</td>
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4 The grammaticality of (5) shows that case matching primarily concerns the morphophonological shape of a relevant form and not the abstract case features that it represents in a specific syntactic context.

5 The dative neuter form was occurs only after prepositions (Ouden 2006: 316):

(i) Was was sprecht du?
    of whom/dat speak you
    'What are you talking about?'

However, it appears that in questions involving non-animate dative wh-objects there is a gap in the paradigm: neither was nor the neutral wh-pronoun wem can be used:

(ii) *Wem war gleicht dieser Haus?
    who.dat? what.dat resembles this house
    'What does this house resemble?'

Pullum and Zwicky 1986, Ingrid 1990, Dalrymple and Kaplan 2000, Citko 2005, Dalrymple, King, and Sadler 2009), but what is important for present purposes is that such examples have the potential to provide an important diagnostic for whether a particular syncretism is systematic or accidental. Returning to the example of the German 1pl/3pl identity, we see that coordinations parallel to the English *either you or they are...* are possible, while coordinations involving, for example, 1pl and 2pl are not (Eisenberg 1973, Pullum and Zwicky 1986, Wunderlich 2003). The comparison between (5a) and (5c) is based on examples from Eisenberg (1973). Both show that for at least some speakers, coordination is possible only when the verb form is compatible with both conjuncts independently. Crucially, however, example (5c) is judged to be awkward or unacceptable, even though the verb form gewinnt 'win' is ambiguous between 3sg and 2pl.

(6) a. Entweder wir oder sie gewinnen.
    either we or they win-1pl/3pl
    'Either we or they will win.'

    either we or you.pl win-1pl/win-2pl
    'Either we or you will win.'

c. Entweder er oder ihr gewinnt.
    either he or you.pl win-3sg/win-2pl

(7) a. ... weil wir Bier und Milch trinken.
    because we beer and they milk drink-1pl/3pl
    'because we drink beer and they drink milk'

b. ... weil wir Bier und Milch trinken/Drinkt
    because we beer and you.pl milk drink-1pl/drink-2pl

c. ... weil er Bier und Milch trinkt.
    because he beer and you.pl milk drink-3pl/drink-2pl

This syntactic evidence corroborates the morphological evidence discussed above that the identity of the 1pl and 3pl has a different status from that of the 3sg and 2pl, and suggests that speakers may treat the former as a meaningful syncretism but the latter as an accidental homophony. In a similar vein, Fanselow and Frisch (2006) found that German speakers more readily accept disjunctions of 1sg and 3sg when the two are identical, as is the case with a small set of verbs in the present tense, and all verbs in the past tense. Thus, 1sg/3sg disjunctions involving non-identical 1sg/3sg marking, such as (8a), are judged significantly less acceptable than those involving identical marking

6 Examples of mismatched agreement, normally with agreement to the closer conjunct, are permitted by some speakers: entweder wir oder ihr gewinnen either we or you.pl win-2pl. This is true also for 3sg/2pl examples in which the verb forms would be different, and 2pl is preferred (entweder er oder ihr wird 'he/she/you.pl drink/drink-2pl'. Pullum and Zwicky (1986: 796) point out some speakers permit resolution of mismatches in favor of the nearest conjunct in English, as well.
(8b,c). It is especially worth noting that the present tense identity in (8b) is not supported by metasyntacticism, and is seen in only a small handful of verbs (mostly modals). This underscores a point made in the previous section, that metasyntacticism is almost certainly not a precondition for treating identical forms as morphologically syncretic.

(8)

a. Er oder ich *schlafen* /schlafst.
   he or I sleep-1sg/3sg
   (Intended) 'He or I sleep'

b. Er oder ich darf schlafen.
   he or I may-1sg/3sg sleep
   'He or I may sleep'

c. Er oder ich rief spät an
   he or I called-1sg/3sg late up
   'He or I called late'

The examples up to this point have suggested an interpretation in which two different feature requirements may be satisfied if the same morpheme is used to realize both feature combinations (e.g. *en* '1pl/3pl'), but they may not be satisfied by two different morphemes that happen to have the same phonological representation (e.g. *3sg* vs. *2pl*). These examples can both be compared with one last possibility, which is that two feature combinations are realized with underlying distinct morphemes that happen to be neutralized in their surface form by phonological processes. For example, the Yiddish verb *arbet-n* 'work', when combined with the 3sg or 2pl suffix -i, yields *arbet-i* → *arbet* by a process of final degeneration or haplography (Jacobs 2005). The resulting form is homophonous with the 1sg (*-i*/*-e*) form: *arbet-* /-e/ → *arbet*. As in German, it is possible to resolve 1pl/3pl mismatches with the syncretic suffix /-en/ (or syllabic -n) (9a), while conjunctions of 3sg and 2pl are awkward or ungrammatical (9b). Mismatches involving 1sg /-i/ and 3sg /-i/, however, are decidedly worse, even if the two forms are identical on the surface (9c).

(9)

a. Ven mir oder zey arbet... /shaver....
   if we or they work-1pl/3pl hard
   'If we or they work hard...'

b. Ven er oder ir *?arbet* /shaver...
   he or you.pl work-3sg/2pl hard
   'If he or you(pl) work hard...'

c. Ven ich oder er *arbet* /shaver...
   if I or he work-1sg/2pl hard
   'If I or he work hard...'

Similarly, Assarina (2010) found that in Russian coordinations involving verbs that select different case forms of the noun are improved when the two forms are deemed morphologically identical (e.g. *inanimate nominative:accusative* (10a) vs. (10b)). However, the same is true when the two forms are underlyingly morphologically and phonologically distinct (*ijoz-0* /'bed-acc' vs. *ijoz-e* /'bed-prep') but become identical through a process of stressless vowel reduction: [ijozh] /'bed-acc/prep/. Thus, (11a) is not judged any better than (11b).

(10)

a. On ne ostavll, tak kakh mum nadoelo, bljude-c...
   He not kept(ACC) as him sickof(NOM) saucer-NOM/ACC
   'He didn't keep, as he was sick of, the saucer...'

b. *On ne ostavll, tak kakh mum nadoelo, tarekh-e...*
   He not kept(ACC) as him sick of(NOM) plate-NOM/ACC
   'He didn't keep, as he was sick of, the plate...'

(11)

a. On ne nastupli, a sidel, na iozh-[i]...
   he not stepped(ACC) but sat(PREP) on bed-ACC/PREP
   'He did not step on, but sat on, the bed...'

b. On ne nastupli, a sidel, na vedz-re...
   he not stepped(ACC) but sat(PREP) on bucket-PREP
   'He did not step on, but sat on, the bucket...'

To date, few studies have explicitly compared the consequences of different types of identity on syntactic acceptability judgments using comparable materials within the same language. If the comparisons reported here turn out to be representative, we could conclude that the acceptability of such constructions rests at least in part on identity at a morphological level, rather than surface phonological identity. Such tests could provide powerful evidence for systematic syncretism—that is, identity at the morphological level—against accidental homophony.

7.1.3 Psycholinguistic evidence

Another promising source of evidence for the distinction between accidental homophony and "true" syncretism comes from experimental paradigms involving reactions to repeated exposure to identical elements. A large body of research on morphological priming effects has established that exposure to a word or morpheme facilitates subsequent recognition of that same morpheme (for reviews, see McQueen

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6 Pullum and Zווitzky (1986) argue that coordinations involving phonologically homophones items can in fact be judged acceptable in certain conditions; these cases require further investigation. Crucially, however, we are not aware of any case in which surface identity as a result of neutralizing phonological processes has been claimed to satisfy conditions of syntactic featural requirements.

7 Paredes and Trisch (2006) provide a processing-based interpretation of resolutions such as 'er oder ich dorf...'. He or I need.3sg.3pl. According to this account, such mismatches are literally ungrammatical, but are easy to resolve (or hard to report) due to the surface identity of the two forms involved. This is an important possible approach, but it is not clear to us how to account for differences between acceptable identities (German 1sg/3sg dorf) and unacceptable identities (Yiddish 1sg/3sg arbet).

7 However, note that many Yiddish speakers appear to permit resolution to either the first or nearest conjunct, making the examples in (9) fully acceptable.
and Cutler 1998, and Marslen-Wilson 2007). The question of interest from the point of view of separating true syncretism from accidental homophony is whether it is possible to distinguish priming effects among items that undeniably share a morpheme from priming effects among accidentally homophonous items.

A number of studies have investigated the degree and time course of priming among unrelated homonyms, such as bug: meaning insect vs. recording device. Swinney (1979) played subjects spoken sentences that contained homonyms in biasing contexts (e.g. the word bug in a sentence about spies), and at the same time, presented orthographic stimuli that were semantically related to the other meaning of the word (e.g. insect) for lexical decision. The results showed that in spite of the inappropriate context, both meanings of the homonym appear to be activated by its presentation, as revealed by faster reactions to their semantic associates. This effect disappears extremely quickly, however, perhaps due to suppression of the unintended homonym once the correct lexical item has been identified. (See Elston-Güttler and Fiederici, 2005, for a review of related findings, using both priming and also brain imaging techniques).

Based on this and similar results concerning the time course of activation of homonyms, one might hope to investigate whether activation of 2pl -t in German by presentation of 3sg -t bears the hallmarks of robust and long-lasting identity priming, or like the fleeting homonymy priming. Unfortunately, unlike the two meanings of a homonymous lexical item like bug, the meanings of lebt ‘live-3sg’ vs. lebt ‘live-2pl’ are not sufficiently different to be able to test for priming of different semantic associates, and we are not aware of any studies that have managed to distinguish processing of accidentally homophonous morphological forms based on their difference in meaning. There are some hints that priming effects may differ between homophonous inflected forms, however. Clahsen, Sommervogel, Horic, and Ebisch (2001) presented subjects with inflected German present tense verb forms, accompanied by subject pronouns in order to establish a context that should facilitate recognition of the intended form: e.g. ich lebe ‘I live-1sg’, du lebst ‘you live-2sg’. It lebt ‘he live-3sg’. Subjects were then presented visually with 1sg forms (e.g. lebe) for lexical decision. As expected, responses to 1sg forms after hearing a 1sg form were fastest (repetition priming). What is important for the current discussion, however, is that responses to 1sg forms after hearing 2sg lebst or 2pl lebt were also facilitated—in fact, to an extent statistically indistinguishable from identity priming of 1sg on itself. Presentation of the 3sg lebt form, on the other hand, did not lead to the same degree of facilitation; in other words, processing 2pl lebt and 3sg lebt did not lead to identical effects.

It must be acknowledged that this result is open to multiple interpretations, since the presentations of 3sg vs. 2pl lebt necessarily differed not only in their morphological features, but also in the pronouns that were presented (er vs. ihr), which conceivably have played some confounding role in processing the verb form. The interpretation that Clahsen et al. (2001) provide is relevant to the issue of syncretism: they propose that the high frequency of the 3sg allows listeners to access it as a whole form without decomposing it; thus, the representations of the 3sg and 2pl differ from one another (lebt/ vs. lebt-7t/). Crucially, whether it is frequency or some other difference that distinguishes the 3sg from the 2pl, it is evidently not the case that they are processed identically. Although we may draw only limited conclusions based on this result alone, this type of evidence has the potential to cast doubt on analyses that posit a single representation for the 3sg/2pl syncretism. At the very least, experimental evidence that homophonous inflected forms are processed differently places a burden on the analyst to explain how this can be, if they are represented identically.

7.2 Theoretical approaches to syncretism

In this section, we will review a selection of theoretical approaches to syncretism that have been proposed in the literature, including underspecification (Jakobson 1956, Bierwisch 1961, Andrews 1990, Blewen 1995), impoverishment (Noyer 1992, 1998, Halle 1997, Harley 2008), rules of referral (Zwicky 1985, Stump 1999a, 2001), and approaches based on violable interacting constraints (Trommer 2001, McCarthy 2005, Wunderlich 2004, Müller 2007, 2008b, Xu 2007). The discussion of current formal models of syncretism is organized around a particular data set, focusing on properties of verbal inflection in German to illustrate different modes of analysis and further sharpen our view of different types of syncretism. Standard German makes a useful test case, since it shows an instructive mix of seemingly significant and accidental syncretism (including, e.g., plural -en vs. 3sg/2pl -t), and there are detailed morphological analyses to draw on (e.g., Bierwisch 1961, Pike 1965, Wiese 1994, Wunderlich 1996, Rampton 2002, Müller 2006b, c to name a few). Consider the data set in Table 7.6, which includes past and present forms for three verbs representing the major inflection classes.

Table 7.6: Inflected Forms of German Verbs

<table>
<thead>
<tr>
<th>Verb</th>
<th>Present Tense</th>
<th>Past Tense</th>
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</thead>
<tbody>
<tr>
<td>haben</td>
<td>habe</td>
<td>hatte</td>
</tr>
<tr>
<td>können</td>
<td>können</td>
<td>konnte</td>
</tr>
<tr>
<td>wissen</td>
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<td>wisse</td>
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</tbody>
</table>

Taking a closer look at Table 7.6, we can identify at least two cases of non-accidental syncretism that any analysis has to account for:

- 1pl and 3pl forms are syncretic in all tenses and paradigms
- 1sg and 3sg are identical in all past tense paradigms

Note that in spoken varieties of German (and more generally in most dialects) the schwa-suffix occurring in 1sg is in fact only a facultative ending, which is often realized as zero (cf. Veith 1977, Richter 1982, Eisenberg 1994: 111; basically the same goes for the schwa in the present plural endings). The difference between 1sg.pres (where the schwa may occur) and 1sg past of strong verbs (where it must not occur) can possibly be attributed to a (surface) constraint (at work in more formal registers)

---

10 Clahsen et al. eventually reject this explanation, based on the fact that in a subsequent experiment the 3sg does not show the same lack of priming. This discrepancy is not predicted by either the whole-form access account, nor is it expected based on the paradigmatic structure that Clahsen et al. posit. Further work is needed to determine the details of what factors influence the degree of facilitation among morphologically related inflected forms.

11 Many of these mechanisms and the cases of syncretism they derive may also be considered sources of zero exponence (of morphosynthetic features neutralized under syncretism). See Trommer (this volume) for detailed discussion.
with respect to the value of [F], and may be employed both in [+F] and [-F] contexts. The simplest use of underspecification is to allow a morpheme to occur in a set of contexts that share particular feature values. For example, adopting the widespread assumption that person features may be decomposed into the binary features [+sayer] and [+hearer], the syncretism between 1pl and 3pl -en can be represented by allowing the morpheme to be specified simply as [-hearer, +pl] (that is, omitting the [+sayer] specification). Thus, the morpheme is made compatible with all non-second person plural forms (Jakobson 1936, Bierwisch 1967, Andreas 1990, Halle and Marantz 1994, Blevins 1995, Harley 2008, and many others). Simple underspecification of this sort is an appealing mechanism because it provides an extremely restrictive, and therefore predictive, theory of what combinations of ‘cells’ given morpheme can express—namely, combinations that constitute a natural morphological class. In the case of 1pl/3pl -en, underspecification is possible because the two cells [1pl [+sayer, -hearer, +pl], 3pl [+sayer, -hearer, +pl]] share the feature values [-hearer, +pl].

Underspecification alone does not work to capture the present tense 3sg/2pl -t syncretism. Setting aside for the moment the possibility that this identity is actually accidental homophony in modern German, we consider here how this identity might be analyzed, if evidence were to emerge that speakers treat it as morphologically significant. Assuming that the only feature value that 3sg and 2pl have in common is [-sayer], there is no way to specify the set (3sg, 2pl) to the exclusion of 2sg and 3pl; in other words, 3sg and 2pl by themselves do not constitute a natural class. In order to capture such distributions with underspecification, we require an additional mechanism: ordering with blocking. For example, let us assume that the 2sg suffix -st is represented as [+hearer, -pl] (or, with the redundant non-minimal specification [+sayer, +hearer, -pl]), while the 3sg/2pl suffix -t is represented as [+sayer]. In principle, both are compatible with a 2sg context [+sayer, +hearer, -pl], but -st realizes more of the features provided by the context. A very natural assumption is that in the competition between -st and -t to realize the features [+sayer, +hearer, -pl], the more specific item -st gets priority, and that application of insertion of -st blocks the more general item -t (the Elsewhere Condition, or Subset Principle or Pápin’s Principle Paul 1896, Kiparsky 1973a, Aronoff 1976, Anderson 1992, Halle and Marantz 1992, Halle 1997 and many others; cf. also Botet and Harbour this volume §6.3.1). Blocking by prior insertion of more specific morphemes greatly expands the set of possible syncretisms that can be captured by underspecification, since it allows us to capture combinations of cells which are not by themselves a natural morphosyntactic class, but which represent a subset of cells from a natural class that are not covered by more specific elements. In the limiting case, a morpheme may be assigned no featural specification at all, allowing it to appear as a default in all cells not covered by a more specific morpheme.

12 The set of available natural classes depends on the precise feature system that is employed. In a system with relatively little feature decomposition (e.g. [1st], [2nd], [3rd]), there are few natural classes, and correspondingly fewer syncretisms can be captured. Of course, much of this prescriptive power is lost if the feature system is so expressive as to cross-classify all inflected categories; we assume the limited set of person-number features ([+sayer], [+hearer], and [+pl]).
Continuing for the moment to confine ourselves to person/number marking in the present tense, the following set of specifications would suffice to derive both the 1pl/3pl syncretism (underspecification for [+hearer]) and the 3sg/2pl (underspecification for [+hearer], [±pl], and possibly even [-speaker]).

(12) Person/number Vocabulary items with underspecification and blocking (present tense):

\[
\begin{align*}
{\text{[+speaker,-hearer,-pl]}} & \rightarrow (\text{-}3)/ \\
{\text{[-speaker,+hearer,-pl]}} & \rightarrow (\text{-}3)/st \\
{\text{[+hearer,+pl]}} & \rightarrow (\text{-}3)/n \\
{\text{[-speaker/elsewhere]}} & \rightarrow (\text{-}3)/t
\end{align*}
\]

These simple mechanisms are insufficient when we take into consideration one additional syncretism, however; that between the present tense 1sg, past tense 1sg, and past tense 3sg. As mentioned above, there is reason to think that this is a non-accidental syncretism, since it occurs exceptionally across all inflection classes (strong and weak). Furthermore, it occurs in not just the past, but also the subjunctive (and even in some irregular present tense verbs). An underspecification approach to the distribution of -Ø would require that it be compatible with all non-second person singular contexts([-hearer,-pl]). This specification is also consistent with the present tense 3sg, so the challenge is to get -t to occur in this context instead. We could specify -t as the more specific [+speaker,+present] in order to cover both 2nd and 3rd person singular and plural cases, but this has two problems: first, it is no longer less specific than -en([-hearer,+pl]), so there is no reason why -en should be used instead of -t in the 3pl. What’s worse, restricting -t to the present tense in this way fails to account for why it is also used for the 2pl in the past tense.

We conclude that using just the mechanisms of underspecification and blocking, the only way to describe the distribution in Table 7.6 is to posit that the 3sg present and 2pl present/past are separate morphemes. This may actually be a positive result, given the discussion above concerning the different status of 1pl/3pl syncretism vs. 3sg/2pl syncretism as diagnosed by feature mismatch resolution under coordination. In this case, we might conclude that a restrictive theory of syncretism is able to predict which distributions learners treat as significant, and which must be treated as accidental. Given the tentativeness of the evidence in section 7.1, however, it nonetheless seems worthwhile to explore mechanisms to capture such cases of syncretism, under the assumption that some patterns that cannot be described with simple underspecification will indeed prove to be non-accidental.

7.2.2 Impoverishment

Impoverishment rules delete a subset of the features contained in a given inflectional category/head, prior to the insertion of vocabulary items into terminal nodes. For this reason, they represent a more powerful tool to model systematic syncretism. Impoverishment rules can play two distinct roles in the analysis of syncretism. First,

because they alter feature specifications prior to Vocabulary insertion, they provide a direct means for modeling system-wide metasyncretisms, in which two forms are always identical regardless of the morphemes involved. The deletion of features or feature values may also widen the distribution of less specified Vocabulary items, since it permits them to be inserted in contexts where their use was previously blocked by more specified forms. The following analysis of German verb inflection in terms of impoverishment is based, with minor modifications, on Frampton (2002) and Müller (2006a, b), who assume decomposition of morphosyntactic features such as person into more primitive features.14 Continuing to assume that person features are represented by [-speaker] and [+hearer], the relevant impoverishment rules that derive the major patterns of syncretism (identity of 1pl and 3pl, and 1sg,past and 3sg,past) can be stated as in (13).

(13) Impoverishment rules for German verb inflection:

a. [+speaker] → Ø/[-hearer,+pl]

b. [-speaker] → Ø/[-hearer,-pl,+past]...

Rule (13a) neutralizes the distinction between first and third person in the plural via neutralizing the feature [+speaker] (which serves to differentiate between first and third person). As a result, 1pl and 3pl must always be realized by the same exponent. Rule (13b) does the same for the distinction between 1sg and 3sg in the past tense, giving rise to the second system-defining syncretism mentioned above.

Abstracting away from suppletion, the following inventory of Vocabulary items serves to account for the major cases of person/number syncretism in the verbal inflection of German (in the past tense of weak/regular verbs, the relevant affixes attach to the past tense marker -st; cf. Eisenberg 1994: 110f, Müller 2006a, b):

(14) Person/number Vocabulary items with impoverishment:

\[
\begin{align*}
{\text{[+hearer,+pl]}} & \rightarrow (\text{-}3)/st \\
{\text{[-hearer,+pl]}} & \rightarrow (\text{-}3)/n \\
{\text{[+hearer,-pl]}} & \rightarrow (\text{-}3)/t \\
{\text{elsewhere}} & \rightarrow (\text{-}3)/n
\end{align*}
\]

The marker -st, which is specified for both person ([+hearer]) and number ([-pl]), is used in all 2sg contexts (including the suppletive paradigm if bist is analyzed as bi=-st). The plural marker -(o)n is may be inserted into inflectional nodes characterized by the feature [-hearer] (i.e., in non-2nd person contexts). Note that even without the impoverishment rule in (13a), the [+hearer,+pl] specification would be sufficient to capture the 1pl/3pl syncretism for this marker; the impoverishment rule captures the fact that this identity holds not only for 1pl/3pl -st/-n, but also for suppletive items such as sind ‘be=1pl/3pl’ (metasyncretism). The marker -t is compatible with all 2nd and 3rd person contexts. However, its use as a realization of 2sg is blocked by the existence of a more specific marker -st, due to

14 The analysis presented differs from Müller’s (2006a, b) analysis in that for expository reasons, we do not make use of lexical decomposition and Fission (e.g., Müller decomposes 2sg -st into 2sg -st and -t realizing [-speaker]).
rules of referral merely state that certain inflectional markers are identical; in contrast to other approaches to syncretism (such as underspecification giving rise to natural classes) they do not attempt to derive patterns of syncretism from other ‘deeper’ properties of the relevant markers. Therefore, it is generally assumed that rules of referral should be invoked only in cases of syncretism that cannot be successfully captured by underspecification + blocking (e.g. directional syncretism; cf. Zwyer 1985, Stump 1993, 2001, and §7.3.2 below). As an illustration, consider the following (informal) rules of referral that can be used to describe the systematic syncretisms that characterize the verbal inflection of German:

(15) a. In all tenses and moods, the 1pl has the same form as the 3pl.
b. In the past tense, the 3sg has the same form as the 1sg.

Under this approach, there are no rules of exponence for 1pl and past tense 3sg forms. Rather, 1pl forms such as leg-en ‘put’ simply follow from the existence of a rule suffixing /-en/ in 3pl contexts in combination with the rule of referral in (15a). Similarly, 3sg past tense forms like war ‘be past’ are attributed to a relevant rule of exponence realizing 1sg past forms in combination with (15b).

Like impoverishment rules, rules of referral shift some of the burden of explaining syncretism from the lexicon/vocabulary to the grammar. This shift comes at a cost: in addition to learning a set of morphemes and their distributions, the learner must also discover a set of rules deriving certain forms from other forms. The extra cost may be justified, though, in cases where it helps to explain system-wide metasyntacticism. For example, the fact that 1pl and 3pl are identical only in their suffixal marking (-en), but also in suppletive forms (e.g. sind ‘be.1pl/3pl’) could be captured by the rule in (15a), in much the same way as the impoverishment rule in (13a).

In addition, grammatical rules may have exceptions or may be ordered with other rules so that they are not surface true. In such cases, we might expect to find evidence for ‘overregularization’—that is, extending the pattern of the rule beyond its original domain. A possible example can be found in the history of German. The way (15a) is formulated implies that the marker used for 1pl is taken over from 3pl, and not vice versa. Interestingly, the 1pl/3pl identity has not always been as strong in German as it is now; in fact, in Old High German the two were often distinct; e.g. lēδū-mēδ ‘live.1pl’ vs. līν-ēδ ‘live.3pl’. In many forms, the identity of the 1pl and 3pl appears to have come about as a result of general sound changes, such as weakening of final syllables and cluster simplification. In other cases, however, identity was created through analogical change; this includes the change from 1pl -mēδ to -en, and the change from būrnum to sinth ‘be.1pl’.

As discussed in greater depth in section 7.4.2 below, such changes always extended the 3pl form to the 1pl. Such directionality effects in analogical change would make sense, if learners had encoded the syncretisms that occurred at the earlier stage of the language with rules of referral, which were then subsequently imposed on the rest of the system through overregularization (cf. Stump 1993a, 2001; Baerman et al. 2005; see section 7.3.2 below for more discussion).
Stump (1993a) argues that rules of referral are also called for to capture patterns of syncretism that cannot be captured via underspecification, such as in the verbal paradigm of Macedonian. As shown in Table 7.8, inflectional suffixes fall into three position classes (i.e. different slots in the sequence of inflections) which are marked by 'I' (markers for Imperfect vs. Aorist), 'II' (markers for past tense) and 'III' (person/number markers).

As indicated by shading, 2sg and 3sg forms are identical in the Imperfect and Aorist tenses. This syncretism carries over to other verb classes and it is assumed that it must be analyzed as a systematic property of the verbal inflection of Macedonian. As Stump points out, the 2sg and 3sg "do not obviously constitute a coherent morphosyntactic class" (p. 453) in the verbal inflection of Macedonian. In particular, it seems that the absence of the past tense marker /-v/ in 2sg contexts cannot be accounted for in terms of underspecification + blocking, since it occurs in 1st and 2nd (i.e. non-3rd) person contexts and in both numbers. He therefore proposes that this pattern should be accounted for by the following rule of referral:

(16) In the past tenses, the second person singular has the same form as the third person singular.

According to this approach, the 2sg could be decreed to refer to the 3sg or vice versa. As mentioned above, some cases of 'non-default' syncretism can be handled by impoverishment rules; in fact, Bobaljik (2002) argues that 2sg/3sg syncretism in the past tenses of Macedonian is due to an impoverishment rule that deletes the second person feature value in the environment of [past], giving rise to identity with the relevant (default) 3sg forms. As mentioned above, if impoverishment rules are restricted to feature deletion, they allow a more restrictive set of syncretism patterns ('referred to the less marked') than the more general mechanism of rules of referral. An important question, therefore, is whether there exist patterns of syncretism that require the greater power of rules of referral. At least three relevant types of examples have been identified in the literature: (1) cases of 'syncretism with the more marked', argued to require not just impoverishment, but enrichment/feature insertion (Noyer 1998, Harbour 2003); (2) polarity effects; and (3) cases of bidirectional syncretism (Stump 2001). The first, involving apparent feature insertion, are straightforward: in such cases it can be shown to be morphologically significant and not accidental, then the extra power of referral or feature insertion is necessary. The second and third are taken up in greater detail in sections 7.3.1 and 7.3.2 below.

7.2.4 Optimality-theoretic approaches to syncretism

The analyses discussed thus far treat syncretism as the loss of morphosyntactic distinctions, using representations that disregard certain featural specifications in order to allow a morpheme to appear in a broader range of contexts. By contrast, a good deal of work in Optimality Theory (henceforth OT) has attempted to derive syncretism by imposing additional constraints on surface forms, forcing morphologically related forms to be partially or fully identical to one another. This might perhaps be used to gain a better understanding of the general tendency towards syncretic forms in language acquisition and change; see Morris (2003) for an application of McCarthy’s (2005) theory of Optimal Paradigms to paradigm leveling in Old Spanish; and see also Wunderlich (2007) on the notion that polyfunctional affixes are more optimal than fully distinctive forms.

Similar to other theories of inflection, OT approaches to the phenomenon of syncretism come in two varieties. On the one hand, there are morpheme-based approaches, which assume that the relation between the form of an exponent and its feature specification is encoded as lexical entries (Grimshaw 2001, Trommer 2001, Wunderlich 2004, McCarthy 2005, Xu 2007, Müller 2008b). Patterns of syncretism may then be accounted for by a combination of underspecification and optimization procedures that select the form that can be realized in the insertion context with the least severe violations of a set of faithfulness constraints (cf. Grimshaw 2001, Trommer 2001, this volume, Wunderlich 2004), or an OT equivalent of rules of referral (Xu 2007). An alternative morpheme-based OT approach to syncretism is developed in Müller (2008b), who argues that the lexic is consists of an inventory of fully specified form-function pairings ("leading forms"), leaving a set of cells in the paradigm unfilled. These are then filled by an OT optimization that selects the leading form that can be fitted to the relevant context with as few feature modifications or deletions as possible.

On the other hand, there are a-morphematic approaches, in which the distribution of markers is fully determined by the workings of interacting violable constraints. These constraints may select exponents based on their phonological properties, or they may require (or penalize) certain pairings of exponents and grammatical categories/feature specifications. For example, Müller (2007) develops an analysis of bidirectional syncretism in which a phonologically motivated preference for the most sonorous exponent selects elements out of a pool of inflectional markers that are not specified for morphosyntactic features. (See also Müller, 2002, on determiner inflection in German, and Carstairs-McCarthy, 2007, on weak adjective and noun inflection in German.)
The most novel contribution of OT to the analysis of syncretism, however, is arguably not the mechanisms it provides for realizing morphological exponents given a set of morphosyntactic features. Rather, what distinguishes OT is that it allows the featurally expected exponents to be overridden by phonological considerations such as phonotactic well-formedness or the desire for related forms to resemble one another. Constraints which prefer inflectionally related forms to be uniform have been given various names in the literature, including UNIFORM EXPONENT or PARADIGM UNIFORMITY (cf., e.g., Kenstowicz 1997, Steriade 2000). A particularly ambitious application of this type of constraint interaction can be seen in the attempt to integrate the analysis of morphological and phonological neutralization, using constraints that demand phonological identity. In what follows, we will discuss a proposal put forward in McCarthy (2005) which deals with the availability of stem allomorphy and its connection to formal properties of the set of inflectional affixes that attach to the stem.

7.2.4.1 Optimal paradigms (McCarthy 2005) McCarthy (2005) develops an OT model of inflectional morphology that focuses on the traditional observation that there are surface resemblance between morphologically related words (i.e., words which belong to the same paradigm). In OT, surface identity can be modeled by invoking output-output correspondence constraints, which demand faithfulness between independently occurring surface forms (cf., e.g., Kenstowicz 1997, McCarthy 2005, Benua 1997, 2000, Burzio 2005). In McCarthy's (2005) Optimal Paradigms (OP) model, it is assumed that the candidates subject to optimization consist of entire inflectional paradigms, where a traditional notion of 'paradigm' is presupposed ("an inflectional paradigm contains all and only the words based on a single lexeme", p. 173). Identity or non-identity of exponence is then accounted for by assuming that there are correspondence relations between the candidate outputs ("every output realization of a lexeme stands in correspondence with every other output realization of that lexeme", p. 171).

As a result, output-output faithfulness constraints may interact with markedness and faithfulness constraints to override regular phonological processes, causing them to overapply in order to make the surface allomorphs more similar to one another than we would otherwise expect. Furthermore, McCarthy assumes that there are no bases in inflectional morphology. Instead, it is assumed that the phonological form of a certain combination of stem + inflectional affix can be determined only through simultaneous evaluation of all members of the inflectional paradigm, so that the outcome for one may influence the outcome for others through output-output faithfulness. Since output-output faithfulness constraints demand identity among related forms, this provides a strictly phonological mechanism for deriving syncretism (at least for the root/ stem portion of the word).

An intriguing consequence of this phonological approach to identity is that certain facts may be analyzed as 'syncretism', even though they are not typically treated as such in morphologically-oriented approaches. McCarthy illustrates this with an analysis of Morpheme Structure Conditions, in which morphemes with a certain phonological shape simply do not exist in the language. Specifically, he shows that constraints on the syllable structure of morphemes in Classical Arabic interact to require that lexical stems have a single, invariant shape, but with different consequences for nouns as opposed to verbs. In Classical Arabic, there are as many as fifteen different derivational classes for verbs, depending on how the root (typically consisting of a sequence of three consonants) is combined with a particular vocalic melody (signaling aspect and voice) and a stem template (i.e., a CV pattern) which marks different conjugations such as causative (CVCCVC) or reciprocal (CV-CVC). (McCarthey 2005: 179ff., Bobaljik 2008: 36). Illustrative examples are given in Table 7.9.

In addition, there is an asymmetry between nouns and verbs with respect to the set of possible stem templates. While verb stems uniformly end in [CV] (i.e., there is no verbal stem template that ends in [CV:C] or [CVCC]), noun stems exhibit more variation with respect to the structure of their right edge: despite the fact that there are fewer noun stem templates than verb stem templates, the former exhibit a richer array of prosodic patterns (in particular, they may end in [CV:C], [CV:C], or [CVCC]). McCarthy observes that there seems to be a correlation between the set of permissible syllable structures at the right edge of stems and phonological properties of the inventory of inflectional suffixes that attach to the stem: specifically, all nominal inflectional suffixes begin with a vowel, while the set of inflectional suffixes which attach to verbal stems includes both V-initial and C-initial morphemes (see McCarthy 2005: 179ff. for details). This observation is then taken to motivate an OP approach in which the temporal differences between nouns and verbs are directly attributed to phonological differences concerning the sets of affixes that attach to nouns and verbs, respectively. In particular, McCarthy proposes a set of output-output faithfulness constraints that demand that stems exhibit a non-alternating, constant phonological shape, respectively. However, as already noted above, in contrast to related proposals (cf. Kenstowicz 1997, Burzio 1996, 2005, Steriade 2000), McCarthy assumes that the input to the relevant OP constraints consists of entire paradigms, and not of individual forms. The optimal candidates are then those stem forms/paradigms that can combine freely with the relevant sets of inflectional markers without incurring markedness violations. A combination of OP constraints and common markedness constraints then ensures that verb stems, which must combine

<table>
<thead>
<tr>
<th>Table 7.9. Templates and prosodic morphology: Classical Arabic k-1-b 'write', conjugations I-IV</th>
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<tbody>
<tr>
<td><strong>PERFECTIVE</strong></td>
</tr>
<tr>
<td><strong>ACTIVE</strong></td>
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<tr>
<td>I</td>
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with a larger set of more diverse suffixes, can only end in CVCL, while noun stems may exhibit more variation in their shape, due to the fact that they need only combine with suffixes that start with a vowel.

McCarthy illustrates this approach with the root /fad- 'do', assuming that under the common OT hypothesis concerning richness of the base (Prince and Smolensky 1993, McCarthy 2002) it is expected "that the lexicon supplies verb stems that are as diverse as noun stems" (McCarthy 2002: 180). As a result, there are hypothetical verb stems such as faša'a or fašalu alongside the actual verb stem faša'al. McCarthy then considers a selection of candidate paradigms derived from a hypothetical verb stem with a long vowel in the final syllable, faša'al, focusing on the following possibilities (p. 181):

(17) **Candidate Paradigm**

<table>
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<tr>
<th>Remarks</th>
</tr>
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<tbody>
<tr>
<td>a. &lt; faša'a, fašalu, ... &gt;</td>
</tr>
<tr>
<td>b. &lt; faša'a, fašalu, ... &gt;</td>
</tr>
<tr>
<td>c. &lt; faša'a, fašalu, ... &gt;</td>
</tr>
</tbody>
</table>

In (17a), all forms of the paradigm preserve the long vowel of the input form. However, attachment of a C-initial suffix gives rise to forms with a superheavy medial syllable such as *fašalu 'V-initial', which is generally impossible in Arabic (note that no problems arise in cases where a V-initial suffix is added to the verb stem). In (17b), this defect is repaired by the application of a process of closed-syllable shortening, giving rise to forms that comply with the phonotactics of Arabic. However, this repair leads to intraparadigmatic alternation concerning the surface form of the verb stem (faša'aL vs. faša'al), which is ruled out by an OP constraint OP-IDENT-Wt demanding output—output faithfulness with respect to vowel length (i.e. vowel length must not alternate within a paradigm; cf. also Urbanczyk 1996). Finally, (17c) represents the winning candidate. The resulting paradigm is characterized by an apparent overapplication of closed-syllable shortening, which has also taken place in contexts (with V-initial suffixes) where there is no phonotactic motivation for that rule. As a result, the long vowel of the input form has completely disappeared in the surface forms—but this is precisely what we expect under a ranking which favors output—output faithfulness over input—output faithfulness (McCarthy 2005: 185).18

18 The highly ranked markedness constraints *μuSμ|σ₁ and *App-σ rule out syllable structures which are disallowed in Arabic: *μuSμ|σ₁ prohibits trimoraic (superheavy) syllables while *App-σ "prohibits linking a coda consonant directly to the σ node as an appendix" (McCarthy 2005: 183).

### Table: OP-IDENT-Wt >> IO-IDENT-Wt

| /faša'al / + [a, ta, ...] | *μuμ|σ₁ | *App-σ | OP-Id-Wt | IO-Id-Wt |
|---------------------------|--------|--------|---------|---------|
| a. < faša'a, fašalu, ... > | | | | |
| b. < faša'a, fašalu, ... > | | | | |
| c. < faša'a, fašalu, ... > | | | | |
| d. < faša'a, fašalu, ... > | | | | |

In contrast, no such effects can be observed with noun stems. Due to the fact that all relevant inflectional affixes are V-initial, a stem-final consonant can always be syllabified as an onset (of the suffix), and the highly ranked markedness constraints can be satisfied without requiring any repairs (i.e. closed-syllable shortening). Consequently, for nouns, further stem shapes (i.e. CV:C or CVCC) are possible in addition to CVC.

The upshot of this analysis is that what appears to be a 'purely phonological' fact about Classical Arabic—namely, the non-occurrence of verb stems with certain prosodic shapes—turns out to be a byproduct of a requirement for syncretism (surface identity). An important additional prediction of the Optimal Paradigms approach that is worth highlighting here is that by allowing all members of the paradigm to determine the outcome, the OP approach also predicts the possibility of 'majority rules' effects, in which the choice for a given form depends on which allomorph occurs in more slots in the paradigm. McCarthy (2005) argues that such cases do occur, providing an example from Moroccan Arabic. In the attested domain, such effects appear to be rare, if they are found at all. However, we must be cautious in interpreting this claim, since morphological analyses of inflectional systems are rarely devised with the possibility of having the morphological exponents partly determined, or even overruled by the phonology. In principle, majority rules effects could arise if there were multiple options available for realizing a particular combination of features. For example, the following set of morphemes provides two options that are compatible with the 2pl:

(19) **Underspecified morphemes leave competition in 2pl:**

[+Hearer] ↔ /-ba/

[+pl] ↔ /-kl/

If morphology provided two alternatives for the 2pl, and a phonological output—output identity constraint demanded that all affixes have the same realization (where not inconsistent with the morphosyntactic specifications), then the fact that the suffix /-kl/ occurs in two other parts of the paradigm (1pl, 3pl) while /-ba/ occurs in only one other cell (2sg) could privilege the use of /-kl/.
In sum, output-output conditions and constraint interaction within Optimality Theory provide a potentially very different set of tools for analyzing syncretism in phonological, rather than morphological terms. It seems unlikely that all of the syncretism facts discussed in the preceding sections can be analyzed insightfully in terms of phonological identity conditions—for example, the 1pl/3pl /-en/ syncretism of Standard German has no obvious phonological motivation. At the same time, output-output conditions appear to be quite useful in explaining facts such as the underspecification of coronal dissimilation in Swabian (cf. Hall and Scott 2007), or the lack of cluster-initial nouns in Classical Arabic. If both of these mechanisms prove to be necessary, it remains to be determined what the appropriate division of labor between them is in capturing the range of identity effects in morphological paradigms.

### 7.3 A typology of syncretism

In this section, we focus on typological aspects of the study of syncretism. This is meant to serve two purposes: first, we want to broaden our empirical basis by taking into account data from a wider variety of languages. Second, we want to examine whether the inspection of more complex patterns of syncretism can sharpen our understanding of what properties an adequate theoretical approach to syncretism should have.

In traditional nineteenth-century linguistics, syncretism was often perceived as a (diachronic) deviation from the so-called 'agglutinative ideal' of a one-to-one relationship between form and function (cf., e.g., Mayverbuchler 1981, Dressler 2003). However, upon closer inspection, it becomes clear that syncretism is a defining characteristic of inflectional systems, showing up virtually in any language that exhibits some amount of inflectional morphology (cf. Baerman et al. 2005), with case, person, gender, and number being the features that are most commonly affected by it. Syncretism seems to be most prevalent in highly synthetic languages (e.g. classical Indo-European, Slavic), while it is less frequently found in agglutinative languages such as Turkish (cf., e.g., Krätke 1976).

Further cross-linguistically valid tendencies concern the way features/feature values interact as triggers or factors conditioning syncretism (see Baerman et al. 2005 for a comprehensive overview). In particular, it appears that across languages, there is a close link between syncretism and markedness, in the sense that the greater the number of marked features in a relevant inflectional node, the greater the likelihood of syncretism (cf., e.g., Boeder 1976, Bybee 1985a, Fradinck 1991; see Baerman et al. 2005 for a wealth of relevant data). For example, it is well known that languages tend to signal fewer distinctions in the (marked) plural than in the (unmarked) singular. Relevant examples where a certain inflectional distinction fails to be marked in the plural include the realization of case (Russian kniga 'book-so-nom', knizhka 'book-so-acc') vs. the sole plural form knizhki), gender (3rd person pronouns across Germanic, e.g. English he/she/it vs. 3pl they), and person (so-called Einheitsplural 'common plural' in Low German and Alemannic verb inflection, where there is only a single plural formative for all persons (which are distinctly marked in the singular)); see also §7.4.2 below). In addition, we can observe that certain combinations of cases or numbers are more likely to be affected by syncretism than others. For example, one widespread pattern of case syncretism collapses the core cases used to mark subject and object as in characteristic nominative/accusative syncretism affecting neuters in Indo-European; in Latin, nominative and accusative are collapsed in the neuter forms of adjectives (bonus 'good-nom/acc'), but distinct in masculine forms (bonum 'good-nom' vs. bonum 'good-acc'). Another common pattern involves syncretism of core and non-core cases (e.g. syncretic accusative/genitive forms in Slavic), while syncretism of non-core cases is less frequent and more idiosyncratic concerning the particular cases involved. However, while there are some clear preferences concerning the contexts and features/feature values affected by syncretism, it seems that there are only few, if any, clear generalizations concerning what is possible and what is not (cf. Baerman et al. 2005). The fact that apparently almost anything goes in the realm of syncretism raises serious problems for approaches that assume feature systems/hierarchies which impose narrow restrictions on the set of possible natural classes (such as Harley and Ritter 2002b). As pointed out above, without independent evidence about which cases of syncretism are treated by speakers as systematic, we must be cautious about ruling out generally valid representations based on the occasional apparent exception. However, if we take the observed set of syncretisms at face value, a possible conclusion is that we should not attempt to impose tight restrictions on possible morphemes through strong universal constraints on feature values or feature combinations. Under this weaker approach, features do exist, but the feature system must be flexible enough to allow for language specific (or arbitrary) classes. In general, as pointed out by Müller (2008a: 200), if there is such a thing as universal principles of inflection (governing the range of possible syncretism in any given system), then we must look for them in a more abstract domain—not in the primitives (i.e. possible features/feature values) themselves, but rather in the way these primitives underlying grammatical categories can be combined (e.g. by the computational procedures of grammar).

In this section, we will give a (non-exhaustive) overview of the different types of syncretism that can be found across the world's languages (cf. also Wunderlich this volume: §5.2 for a different classification of syncretism types), discussing a set of empirical generalizations that have been proposed in the literature, and pointing out some issues that certain, more intricate patterns such as directional syncretism and polarity effects raise for morphological theory. It is important to note from the outset that unlike typological discussions, the classification of any individual case depends on the analysis that is assumed. Thus, for example, a 'polarity effect' (same marker for [+F+G] and [-F+G], but not [+F-G] or [-F-G]) is only a polarity effect if we have some mechanism for meaningfully relating the exponents of these two values; otherwise, it is simply accidental homophony.

An instructive example of different types of syncretism comes from the nominal declension of Old Irish (masculine o-stem nouns). Old Irish exhibits a rich system of nominal inflections, providing distinctions for five cases (nominative, accusative, genitive, dative, and vocative) and three numbers. Nonetheless, the inventory of distinctive forms does not exhaust the range of logically possible distinctions. Instead,
we find only five different forms that are organized in an intricate pattern of various types of syncretism. First, there is simple syncretism (a term adopted from Baerman et al. 2005), that is, identical forms realizing different cells of the paradigm which differ in a single value of a certain morphosyntactic feature. In Table 7.10, we find two instances of simple syncretism. On the one hand, the plural part of the paradigm displays an instance of simple case syncretism, where a single form (firu) is used to realize both accusative and vocative. On the other hand, we observe that the cells for dative dual and dative plural are merged (feruíg), giving rise to an instance of number syncretism. In addition, we can observe a more intricate pattern of syncretism involving the forms firu (genitive/vocative singular and nominative plural) and feru (nominative/accusative singular, nominative/accusative/genitive/vocative dual, and genitive plural), which both serve to realize multiple (and conflicting) combinations of case and number features.

Table 7.10: Declension of Old Irish 'man' (O’Connell 1912: 28, Pokorny 1923: 77)

<table>
<thead>
<tr>
<th>SINGULAR</th>
<th>DUAL</th>
<th>PLURAL</th>
</tr>
</thead>
<tbody>
<tr>
<td>nom</td>
<td>fir</td>
<td>fir</td>
</tr>
<tr>
<td>acc</td>
<td>fir</td>
<td>fir</td>
</tr>
<tr>
<td>gen</td>
<td>firu</td>
<td>feru</td>
</tr>
<tr>
<td>dat</td>
<td>feruíg</td>
<td>feruíg</td>
</tr>
<tr>
<td>voc</td>
<td>feru</td>
<td>firu</td>
</tr>
</tbody>
</table>

Second, an analysis in terms of underspecification of individual Vocabulary items treats syncretism as a lexical phenomenon. This raises an issue with respect to system-wide syncretisms such as identity of 1pl and 3pl in German verb inflection (see above), where a lexical account in terms of underspecification seems to miss an important generalization, namely that the same kind of syncretism is found across paradigms with different phonological exponents. Thus, it seems that system-defining syncretism should be modeled by other theoretical means such as impoverishment or rules of referral (see also §7.2.1 above).

Finally, and most importantly, there are certain complex patterns of syncretism that apparently cannot be described in terms of underspecification, suggesting that we need additional tools of analysis. To illustrate this, consider again the Old Irish paradigm in Table 7.10. Apart from the simple syncretisms that we have already identified above, there are two additional syncretic forms, fir, and feru, which are part of more intricate patterns of syncretism. Both forms appear with different numbers (fir with singular and plural, feru with all three numbers) and cases (feru with the nominative (pl), genitive (sg) and vocative (sg)); and fir with all cases except accusative. An approach in terms of underspecification faces a problem here since it is not clear how to collapse the relevant cells of the paradigm in any straightforward manner. Neither is it possible to account for the distribution of fir and feru by invoking complete underspecification since it is not possible that both forms represent the elsewhere case. The particular pattern that characterizes the distribution of fir, which occurs with one case in the plural (nominative) but with different cases in the singular (genitive and vocative), is commonly referred to as a polarity effect. Complex patterns of syncretism (in particular, polarity effects and directional syncretism; see below) are often considered a major challenge for an approach to syncretism which solely makes use of underspecification, since the relevant surface effects cannot be attributed to any plausible natural classes of morphosyntactic features. Instead, they have been considered evidence motivating additional theoretical machinery that is part of the morphological component, such as rules of referral (Zwicky 1985). Since such complex patterns of syncretism have been playing a dominant role in morphological theory in the last twenty years, we will now take a closer look at relevant phenomena.
that cannot be handled by underspecification alone, focusing on polarity effects and directional syncretism.\textsuperscript{20}

7.3.1 Polarity effects

Polarity effects, where a certain systematic "morphological opposition seems to reverse its function across environments" (Baerman et al. 2007: 33; accordingly, relevant phenomena are sometimes also referred to as 'morphological reversal') are among the most peculiar patterns of syncretism that seem to elude a straightforward analysis in terms of natural classes (i.e. via collapsing different values of a particular feature); see, e.g., Béjar and Hall (1999), Baerman (2007), Baerman et al. (2005), Lahne (2007), and in particular de Lacy and Wunderlich (both this volume).\textsuperscript{21} A well-known example of polarity comes from Somali, where suffixed determiners come in two variants: the determiner /-ta/ is used in the context of feminine singular or masculine plural noms, while /-ka/ attaches to feminine plural or masculine singular noms (cf. Table 7.11).

Admittedly, examples of full polarity where we find a perfect mirror image of exponents realizing apparently contradictory feature values (which Lahne 2007 calls "chessboard distribution") are quite rare cross-linguistically (cf. Baerman et al. 2005: 104). More frequent are cases of what Baerman et al. (2005) call "partial polarity." Here, a single form is used to realize multiple conflicting feature values (involving non-adjacent cells in the paradigm). Crucially, the relevant examples lack a mirror-image form giving rise to the chessboard distribution characteristic of the Somali determiner system in Table 7.11, as is the case with syncretism of nominative plural and oblique singular forms in Hindi (Table 7.12); the Old Irish paradigm in Table 7.10 above is another relevant example.\textsuperscript{22}

Baerman (2007) gives further examples of polarity effects from a wide range of genetically and typologically different languages including Estonian (partitive suffixes), Hebrew (gender marking), the Nilotic language Dholuo (voicing reversal affecting stem-final obstruents of plural noms, e.g. kíí 'stone', kíí-r 'stone-pl.', kíí 'coast', kíí-e 'coat-pl.'; Tucker 1994, de Lacy, and Wunderlich, both this volume), the Oceanic language Nehan (noun class and number marking on definite articles), the Uto-Aztecan language Tubulalbal (aspect marking on verbs), and the Mixtec language Copala Trique ( tense-aspect-mood morphology).\textsuperscript{23} Thus, while polarity effects do not range among the most frequent morphological phenomena, they still seem to be an undeniable fact of language calling for an adequate (systematic) formal description (see, e.g., Baerman et al. 2005: 105ff, and in particular Baerman 2007; but see de Lacy, and Wunderlich, both this volume, for a critical evaluation).

As already pointed out above, polarity effects seem to pose a challenge to the notion that syncretism corresponds to natural classes (i.e. unique combinations of binary features). A possible solution that has been proposed in the literature is to re-establish natural classes by assuming that inflectional rules may refer to particular configurations of multiple feature values. One such proposal, which is linked to the notion of markedness, has been put forward by Serizaki (1982). According to Serizaki, the chessboard distribution of gender and number marking in Somali serves to signal markedness congruence, in the sense that forms in /-ta/ are used when the markedness values of the underlying gender and number features are the same (either both unmarked, as in the case of masculine and singular, or both marked, i.e. feminine and plural), while /-ka/ signals different markedness values of the relevant values for number and gender (see Béjar and Hall, 1999, for a related approach to polarity effects where relative markedness is defined in terms of the presence/absence of nodes in a

20 Baerman et al. (2005) propose a fine-grained typology of different kinds of syncretism, distinguishing between simple syncretism, nested syncretism, counter syncretism, polarity effects, and directional syncretism. The notion of nested syncretism refers to cases where one syncretism seems to be embedded by another one. A relevant example comes from Upper Sorbian, where the dative and the locative are syncretic in the singular, while in the plural we find syncretism of the dative, locative, and instrumental. Thus, it appears that the pattern of syncretism found in the singular is nested within the more general pattern found in the plural (Baerman et al. 2005: 14). Contrary to syncretism, which is distributed over different paradigms, but never co-occurs in one and the same paradigm, Baerman et al. (2005: 14) give an example from the Nilo-Saharan language Nupe, where some nouns exhibit syncretism of the genitive and locative, while others have syncretic nominative/genitive or nominative/locative forms. Crucially, the patterns of syncretism are mutually exclusive in each individual paradigm.

21 The notion of 'polarity' goes back to Meinhold (1912: 19), who defines it as "Wenn also aus A unter gewissen Bedingungen B wird, so wird aus B unter denselben Bedingungen A." If A becomes B under certain conditions, B becomes A under the same conditions. See Hixson (1967: 184) for an alternative definition that captures the gist of Meinhold's original statement in somewhat more formal terms. See also Sprouse (1993) for an early (critical) discussion of polarity effects.

22 Note that, at least from a conceptual point of view, the suffix /-ka/ does not lend itself to an analysis as the completely underspecified elsewhere case, since it serves to realize marked features such as plural and oblique case (in contrast to e.g. /-ka/ which appears in the context of nominative and singular).

23 See Baerman et al. (2005) for further examples of polarity, including an in-depth analysis of polarity effects characterizing the paradigm of subject-person marking in the Cushitic language Dhaasane (Tosco 2001), which is couched in the framework of Network Morphology (Corbett and Fraser 1992, Evans, Brown, and Corbett 2001). See Wunderlich (this volume) for number marking in the Gu language Dagaare, which involves reversed markers for singular and plural in different stem classes.
repeatedly been called into question whether morphological polarity (as a result of a particular set of inflectional rules/processors) is really treated as systematic and linguistically significant by speakers. For example, Lecarme (2002) argues quite convincingly that the apparent polarity effects in Somali (cf. Table 7.11 above) are actually the result of the particular properties of plural formation in Somali (and possibly other Cushitic languages), which is analyzed as a derivational process. More specifically, plural suffixes are shown to be nominal categories with a fixed gender that overwrites the gender value of the nominal stem. As a result, the suffixed definite determiner in fact reflects the gender of the (derivational) plural suffix, giving rise to the impression of polarity effects with plural forms. This particular (lexical) analysis is supported by the fact that gender reversal is not fully systematic in Somali, that is, there are some plural morphemes (those of classes 3 and 4) which do not give rise to a polarity effect (see Wunderlich, this volume, for more details and discussion of Lecarme’s analysis). Furthermore, other instances of apparent morphological polarity have been shown to be amenable to an analysis in terms of independently motivated morphophonological processes (cf. Wolf 2005, Bye 2006, Trommer 2006e, de Lacy this volume on voice/voicing patterns in Dholuo, van Oostendorp 2005a, on apparent paradigmatic polarity in Limburg Dutch; de Lacy this volume).

7.3.2 Directional syncretism

Another set of phenomena that is often taken as an indication that a proper treatment of syncretism requires special mechanisms in addition to underspecification is so-called directionality effects. The notion of directional syncretism is commonly used to describe a scenario where a phonological exponent that is associated with a certain paradigm cell (i.e. a specific set of feature values) seems to be taken over by another paradigm cell in a certain context. Above, we have already mentioned briefly a relevant example from German verb inflection, repeated here for convenience. Recall that in the present indicative of regular (“weak”) verbs, 1sg and 3sg are distinct: while 1sg is marked by /(-a)/ (overtly realized as schwa only in the context of 1sg.prs. see above), 3sg is marked by /(-t/). However, in the past tense (and subjunctive), 1sg and 3sg are homophonous.

So it appears that in a certain context (past tense), the phonological exponent which normally expresses 1sg is taken over by 3sg. Examples as in Table 7.13, where the take-over seems to go into only one direction (1sg → 3sg), are sometimes called unidirectional syncretism (Stump 2001). As already briefly noted, directionality effects

<table>
<thead>
<tr>
<th>TABLE 7.13. Directionality effect (1sg → 3sg) in German</th>
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<tr>
<td></td>
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<tr>
<td></td>
</tr>
<tr>
<td>1ST</td>
</tr>
<tr>
<td>2ND</td>
</tr>
<tr>
<td>3RD</td>
</tr>
</tbody>
</table>
have inspired the notion that in addition to underspecification and standard rules of
exposition, the morphological component makes available a set of special 'directional'
rules stating that under certain conditions, the exponent of a set of feature values X is
also used to realize another set of feature values Y (i.e. rules of referral; cf. Zwicky 1985;
Stump 1993a, 2001). The pattern in Table 7.13 can then be attributed to a rule of
referral which states that under certain conditions (i.e. in the past tense of regular
verbs), the exponent of s- is extended to 3sg contexts.26

However, as illustrated above for German, it becomes clear on closer inspection
that many instances of unidirectional syncretism can also be captured without the
use of rules of referral, making use of feature decomposition (giving rise to a more
fine-grained system of natural classes) and an additional mechanism leading to zero
exponence of certain feature combinations under the appropriate conditions (e.g.
imperativization rules; cf. section 7.2.2 above, and Frampton 2002, Nevins 2003,
Trommer 2005c).

Still, it seems that not all instances of directional syncretism can be straightforwardly
handled in this way: Stump (2001) identifies another type of syncretism which he
labels bidirectional syncretism. In cases of bidirectional syncretism, there are
two take-overs which move in (two opposite) directions.27 Baerman et al. (2005)
distinguish between two types of bidirectional syncretism, convergent bidirectional
syncretism and divergent bidirectional syncretism. Baerman et al. (p. 136) describe
convergent bidirectional syncretism as a pattern in which "there is a feature value
x which takes the form associated with feature value y in some contexts, while in other
contexts x takes the form associated with feature value y." A clear example of
covariant bidirectional syncretism comes from the Mongolic language Bonan
(Todaeva 1997; see also Baerman et al. 2005: 136f for discussion). As shown in Table
7.14, the accusative is syncretic with the genitive in nouns, while in pronouns the
accusative is syncretic with the dative/locative. Moreover, it appears that the accusative
of nouns takes the form which "properly belongs" to the genitive, while in pronouns the
accusative represents a take-over from the dative/locative.

26 Historically, directionality effects often arise as the result of analogical change extending the domain
of one marker (Baerman et al. 2005: 70ff). For example, it is commonly assumed that in the Old IC
present indicative, the 3sg marker -ar has been extended to 3sg (where the expected inherited ending
would be -(ockey), on the model of verbs in -er and -ir, where 2sg and 3sg fall together due to inde
phono
golog
cal changes (Kuryłowicz 1947, Haugen 1982). Alternatively, the pattern characteristic of directional
syncretism may develop from grammaticalization processes slightly changing a system where the relevant
forms were originally fully syncretic. Baerman et al. (2005: 74f) mention an examples from Nohlin, a
descendant of Old Nohlin. While Old Nohlin exhibited regular syncretism of 2sg/3sg and 1pl/2pl in all
verb paradigms, 3sg and 2pl markers were innovated in Nohlin in the indicative and negative paradigms,
giving rise to the impression of directionality in paradigms that were not affected by this change (the
indicative and the conditional, which in fact represent the original state of affairs).

27 An additional type of syncretism singled out by Stump (2001) is so-called 'symmetrical syncretism'
where the cells/feature values realized by the syncretic forms do not constitute a natural class. An
intriguing example mentioned by Stump comes from the Papuan language Hua (Hueman 1980), where the
forms of 1sg and 2pl verbs are always identical (in all moods). Stump argues that the Hua data is interesting
for theoretical reasons since it cannot be captured properly by standard means such as underspecification
or rules of referral. Instead he proposes an analysis in terms of "morphological metageneralizations" which
express redundancies across classes of realization rules in Paradigm Function Morphology.

In contrast, divergent bidirectional syncretism is exemplified by a pattern in which
"there is a feature value x which takes the form associated with feature value y in
some contexts, while in other contexts x takes the form associated with x" (Baerman et
al. 2005: 139). Baerman et al. illustrate this state of affairs with an example from the
Latin second declension, where in the regular neuter inflection, the nominative
is shaped on the model of the accusative, while in a small class of neuter noun
stems (including vulgus 'crowd', virus 'poison', and pelagus 'sea'), it is the other
way around. The accusative takes over the form of the nominative. This is illustrated
in Table 7.15.

Bidirectional syncretism raises a problem for approaches in terms of standard rules
of exposition + underspecification, since it is not clear how the distribution of the

28 It is important to note that notions such as convergent vs. divergent bidirectional syncretism actually
refer to modes of theoretical analysis and not to the empirical pattern itself. Thus, it seems that instances
of convergent bidirectional syncretism can also be described as divergent. In the case of Bonan, for
example, the pattern can also be analyzed as divergently bidirectional if one treats the nominative
marker as a nominal marker and -e as a pronominal one. From this perspective, the dative of nouns
takes the dative form of pronouns, while in the genitive pronouns take the relevant nominal form (we want
to thank an anonymous reviewer for helping us to clarify that issue).

29 In the kind of divergent bidirectional syncretism exhibited by Latin it seems that there is a systematic
relationship between the two take-overs, in the sense that the domain of the second take-over (certain
neuter) is a (proper) subset of the domain of the first take-over (neuters in general). As pointed out
by Müller (2009a), this suggests an analysis in terms of Stump's (2001) Bidirectional Referral Principle, which
establishes a link between two rules of referral by tying the existence of one rule to the existence of another
rule with a complementary domain.
Table 7.15. Divergent bidirectional syncretism, Latin second declension (singular) (Baerman et al. 2005: 140)

<table>
<thead>
<tr>
<th>Case</th>
<th>Default neuter</th>
<th>Default masculine</th>
<th>Neuter nouns with acc. in -us</th>
<th>'war'</th>
<th>'slave'</th>
<th>'crowd'</th>
</tr>
</thead>
<tbody>
<tr>
<td>NOM</td>
<td>bell-um</td>
<td>serv-us</td>
<td>vulg-us</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>ACC</td>
<td>bell-um</td>
<td>serv-us</td>
<td>vulg-us</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>GEN</td>
<td>bell-1</td>
<td>serv-1</td>
<td>vulg-1</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>DAT</td>
<td>bell-ō</td>
<td>serv-ō</td>
<td>vulg-ō</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>ABL</td>
<td>bell-ō</td>
<td>serv-ō</td>
<td>vulg-ō</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Relevant inflectional formatives can be described by referring to natural classes (cf. Baerman et al. 2005, Müller 2007). For example, a relevant analysis of the pattern exhibited by Bonan would have to assume that at least one of the relevant markers, say -na, represents a natural class, while the other (-de) is a slightly less specified form of the insertion of which is partially blocked by -na. For the sake of the argument, we might propose that -de realizes both accusative and dative, with its insertion in the context accusative/nouns being blocked by the availability of the more specific form -ne which occurs in the contexts genitive/nouns, genitive/phonouns, and accusative/nouns (cf. Müller 2007). However, such an approach would be based on the assumption that the latter three contexts have a certain property in common which identifies them as a natural class. Inasmuch as it is unclear whether such a unifying property can be plausibly assumed, the standard account of syncretism faces a problem here. Accordingly, bidirectional syncretism has been taken to suggest the necessity of directional rules, i.e. rules of referral (Stump 2001, Baerman et al. 2005). For example, Baerman et al. (2005: 137) suggest that the pattern found in Bonan can be captured by the following pair of rules of referral (see also Stump 2001 for a relevant treatment of Romanian verb inflection in the framework of Paradigm Function Morphology):

(22) a. ACC in nouns = GEN
b. ACC in pronouns = DAT/LOC

While the phenomenon of directional syncretism certainly raises issues for standard approaches in terms of underspecification, it is not entirely clear whether it represents clear-cut evidence in favor of rules of referral (cf., e.g., Zwicky 2000, Wunderlich 2004, Müller 2007, 2008b). In particular, several authors have argued that surface directionality effects can be captured without invoking rules of referral. For example, Zwicky (2000) argues that instances of apparent directional syncretism can be described by symmetrical rules alone, and therefore that rules of referral are superfluous and should be abandoned. Starting out from a different set of theoretical assumptions (Optimality Theory), Wunderlich (2004) argues that directional effects can be described by a system of ranked violable constraints that govern the way exponents are matched with bundles of morphosyntactic features. An alternative morphemic OT approach to (h)directional syncretism based on the notion of “leading forms” (see section 7.2.4 above) is developed in Müller (2008b) (see Müller, 2007, for an a-morphemic OT analysis of directionality effects).

7.3.3 The relation between syncretism and portmanteau expression

We conclude the discussion of typological properties of syncretism by mentioning an observation by Carstairs (1987: 109–114) concerning an interesting correlation between syncretism and fused or portmanteau expression of morphosyntactic features. Carstairs points out that in principle, several different kinds of syncretism are conceivable, distinguished by whether the syncretic affix realizes just one type of morphosyntactic feature (e.g. person or number), or whether it realizes multiple features simultaneously (portmanteau/fusion of person and number). This is illustrated in Table 7.16, which shows the effect of syncretism on two different hypothetical languages: one with fully distinct realization of person and number (in the sense that affixes a, b, c realize person and pl realizes plurality, so no person forms are sensitive to number), and one with fusional person/number affixes.

Carstairs points out that in an admittedly somewhat limited sample of thirty-three cases of syncretism that were deemed to be non-accidental, the overwhelming majority (26 out of 33 cases) involve portmanteau morphs, as in Table 7.16d. This tendency is also confirmed with a larger and more balanced sample by Baerman et al. (2005), though no numbers are given.

Why should syncretism preferentially target portmanteau morphs? Carstairs points out that some insight can be gotten by comparing the lists of Vocabulary items needed in each case against the corresponding non-syncretic language. In the case of independent realization (Table 7.16a vs. c), the same set of morphemes is needed in

<table>
<thead>
<tr>
<th>Table 7.16: Some logically possible syncretisms</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Fully distinct</strong></td>
</tr>
<tr>
<td>a. Independent</td>
</tr>
<tr>
<td>X-a</td>
</tr>
<tr>
<td>X-b</td>
</tr>
<tr>
<td>X-c</td>
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<table>
<thead>
<tr>
<th><strong>Syncretic</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>c. Independent</td>
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<tr>
<td>X-a</td>
</tr>
<tr>
<td>X-b</td>
</tr>
<tr>
<td>X-c</td>
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</tbody>
</table>
either case, all that has changed is that the distribution of the 3rd person suffix /c/ is more restricted (3sg rather than 3rd person more generally), while the distribution of the 2nd person suffix is more general (now the 2nd/3rd default). Thus, in terms of economy of lexical specifications, nothing is gained by the syncretism in Table 7.16c. Comparing the portmanteau languages (Table 7.16b vs. d.), on the other hand, here we see a clear saving, since we have one less morpheme that needs to be memorized. The suggestion, therefore, is that syncretism may serve to reduce the number of morphemes/vocabulary items that are needed (see also section 7.4.2 below on the development of so-called Einheitsplural ‘common plural’ in Alemannic).31

This hypothesis also bears a clear relation to the possible historical origins of syncretism. Although the role of economy in motivating diachronic change will be discussed in greater detail in section 7.4, we may briefly consider the learning challenges posed by the languages in Table 7.16a. and 7.16b. Consider a learner of the language in Table 7.16a, at a stage in which the 2pl /X-b-pl/ has not yet been encountered sufficiently often to learn its form by rote memorization. In this case, there are two plausible analyses for the forms that have been encountered: either that /b/ is 2nd person ([+hearer]) and /c/ is 3rd person ([−speaker,−hearer]) (as in the original language) or that /b/ is 2sg ([+hearer,−pl]) and /c/ is the default [−speaker] form.32 Both specifications would be more general than the observed distributions: /b/ has been heard for 2sg ([+hearer,−pl]) but would be assumed to occur in 2nd person ([+hearer]) contexts more generally, while /c/ has been heard only in 3rd person ([−speaker,−hearer]) contexts, but would be assumed to occur in both 2nd and 3rd person contexts ([−speaker]). The former choice, in which the suffix /b/ is underspecified for number, is fully parallel to the otherwise observable 1sg/1pl and 3sg/3pl identities. In this case, the ‘system-congruous’ pattern is that each morpheme is specified for a single feature, rather than letting one morpheme be doubly specified and leaving the other unspecified. There are two possible sources of this preference either a general preference for morphemes to express single feature values, or a systemic preference based on the fact that this analysis allows all three persons to be marked with their own morpheme. Crucially, such a preference would favor the retention of patterns such as Table 7.16a, and disfavor the creation of syncretisms such as Table 7.16b.

Comparing Table 7.16c, we find that in this case, a learner who lacks evidence about the 2pl would not have any way to recover the original system, since the portmanteau suffix /c/ has not been encountered yet at all. Assuming that economy favors underspecification where possible, the learner of this language is free to posit that one of the known suffixes is underspecified, and is therefore eligible to fill the 2pl slot. Table 7.16d could be interpreted as the outcome of a scenario in which the 3pl suffix /f/ was assumed to be underspecified ([−speaker,pl], or perhaps just [pl], or even elsewhere); other assumptions about underspecification might lead to different syncretisms. The upshot is that portmanteau realizations may have the effect of ‘isolating’ inferences about the feature specifications of each individual affix, making it more difficult to recover the original distribution.

Although this learning-based interpretation of the observed typological bias is necessarily somewhat speculative, the broader lesson is that different theories of syncretism make different predictions about possible learning errors and diachronic change. Underspecification, in particular, seems like a particularly promising approach to such changes, since it is quite plausible to imagine that incomplete learning may result in less specified representations. The particular example discussed here serves to show that this alone is probably not sufficient as an account of incomplete learning, however. In the next section, we consider in greater detail diachronic evidence concerning how syncretism appears to have arisen in some particular cases.

7.4 Diachronic aspects

Originally, the term ‘syncretism’ was primarily used to refer to the historical collapse of forms that were formerly distinct (cf., e.g., Pott 1836, and Dibelius’s 1907 comprehensive study of the diachronic merger of the dative, genitive, locative, and instrumental in the history of Germanic). In general, we can distinguish between two major historical pathways leading to syncretism. On the one hand, forms that were formerly distinct may fall together due to phonological changes. For example, in many Germanic languages, inflectional syncretism resulted from phonological erosion affecting unstressed final syllables. Thus, Old High German still exhibits distinct verb forms for the infinitive (e.g. nēman ‘to take’), the 1pl.prsg (nēmanes, nēmen) and the 3pl.prs (nēmant), which all fell together into a single form in the course of time (Modern German nēmen). On the other hand, the same outcome may be effected by morphosyntactic changes, a relevant example being the collapse of the dative and locative singular in the history of Proto-Indo-European (PIE), depicted in Table 7.17.

The merger of the dative and the locative cannot be attributed to phonological change, since the relevant forms should be distinct in o-stem and consonant-stem nouns given our knowledge of the systematic sound changes that led from PIE to

![Table 7.17. Rise of dative/locative syncretism in Indo-European (Greek)](image-url)

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31 Carstairs-McCarthy (1998a) refines and reconsiders this interpretation with a different definition of economy: we discuss here the earlier definition in order to highlight its relevance to theories that rely on degree of specification to derive syncretic distributions.

32 Naturally, the details of the hypothesized feature specifications and the comparison in terms of economy will differ depending on what assumptions one makes about feature hierarchies and the appropriate set of person features.
Ancient Greek, nor is it possible to attribute the collapse of the forms to the complete loss of one of the two cases, since it can be shown that the forms found in Ancient Greek reflect properties of both the dative and the locative (the form found in the o-stems descends from the dative singular, while the form used in the consonant stems is clearly a reflex of the original locative singular). So we must conclude that in the history of Indo-European, the syncretism of dative and locative resulted from "some fundamental reanalysis of the system of morphosyntactic oppositions" (Baerman et al. 2005: 6).

In this section, we identify cross-linguistic pathways and properties of language change leading to syncrétic forms. In addition, we illustrate different modes of analysis, highlighting major lines of thinking in diachronic morphology.

A highly influential idea going back at least to the work of Jakobson (1936) on primitive binary features underlying case distinctions is that the development of syncrétism depends on the existence of some shared property concerning meaning or syntactic functions. For example, Luarghá (1987; 2000) argues that the diachronic merger of case distinctions in Indo-European languages can be attributed to overlapping meanings (e.g. a shared meaning 'location' as the basis of dative/locative syncrétism in Ancient Greek; see also Serbát 1988) or syntactic functions (common peripheral syntactic function of dative-ablative-locative-instrumental as the basis of case syncrétism in Germanic). In a similar vein, Calabrese (1998), discussing case syncrétism in Latin and the further reduction of the case system across Romance, assumes that case syncrétism implies that the relevant cases share a feature value. Calabrese further distinguishes between absolute case syncrétism, which holds across all nominal classes and categories and contextual syncrétism, which affects only certain classes or categories. While the latter is attributed to under specification of individual lexical items, the former is represented by a system of hierarchically ordered Case restrictions, which ban certain combinations of primitive case features (e.g. the Case restriction *[-source, -association] is taken to block the morphological realization of an independent instrumental case in Latin). The subsequent loss of case distinctions characterizing many Romance languages is then analyzed in terms of the activation of Case restrictions, giving rise to new instances of absolute case syncrétism. In this way, the study of the historical development of syncrétism can give clues as to whether features are hierarchically ordered and what the hierarchy should look like (see also Noyer 1992, Lakämper and Wunderlich 1998).

33 Note that the gist of Calabreses's approach to morphological change in terms of the activation/deactivation of Case restrictions is quite similar to analyses modeling diachronic phenomena as the rise/fall of impoverishment rules (e.g., Noyer 1993).

34 As pointed out to us by an anonymous reviewer, one might object that the term 'absolute case syncrétism' is actually a misnomer: if syncrétism by definition involves a form that realizes distinct morphosyntactic feature combinations (see section 7.1 above), then feature combinations blocked by Case restrictions cannot give rise to 'system-wide' syncrétism, since banned combinations are completely absent from the grammatical system and thus cannot be realized by the insertion of (underspecified) phonological exponents.

That line of thinking is also related to the observation that certain combinations of feature values play a conspicuous role in historical processes giving rise to syncrétic forms. On the one hand, it seems that certain feature combinations become more likely to be affected by syncrétism than others. This observation is often linked to the notion of markedness, in the sense that diachronically it is more likely that syncrétism affects forms which realize a set of marked features (cf., e.g., Boeder 1976; Bybee 1985a). On the other hand, we can observe that certain forms are more likely to prevail in processes of analogical change than others. For example, it is a traditional idea in historical linguistics that analogical change leading to syncrétism typically expands the domain of unmarked phonological exponents (Kuryłowicz 1947; Garrett 2008).

Related works include Watkins (1962), who observes that 3sg is the default form which serves as a model for analogical change leading to paradigm leveling (loss of alternations), a change known as Watkins' Law (see also Bybee and Werker 1980). Baerman et al. (2005: 71) present an example from Livonian, where in the present indicative, the 3sg ending -b has been extended to 1sg (where the inherited form should be Ø < *-n), apparently on the model of the preterite forms, where 1sg and 3sg fell together due to regular sound change. Furthermore, it appears that the observations concerning singular forms carry over to the plural part of the paradigm, where across languages, third person forms tend to prevail in cases where person distinctions have been collapsed. An instructive example of analogical changes extending the domain of a 3pl form comes from Alemannic varieties of German, where the 3pl marker turned into a general plural marker for all persons. The relevant historical developments are discussed in more detail in section 7.4.2.

Of particular interest are examples where it seems that certain instances of syncrétism develop in order to 'repair' another syncrétism affecting featural distinctions which are in some sense more central to the system (e.g. in terms of Bybee's 1985a

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35 Considerations of markedness, albeit in somewhat different form, also play an important role in functionalist approaches to morphological change such as Natural Morphology, where it is assumed that change preferably proceeds to a more natural, unmarked outcome with respect to criteria such as iconicity, morphosyntactic transparency, or an ideally bi-unireque pairing of form and function (cf., e.g., Mayrhofer 1980; 1986; Wurzel 1986; Dressler et al. 1987; Bockstél et al. 1995; Dressler 2003).

36 This is in line with the observation that across languages, there are many examples where 3sg is used as a default agreement ending in cases where no proper agreement marker is available (cf., e.g., Shimayama and Berinino 1992, on various Riheto-Romance varieties; Sigurðsson 1996, on Icelandic; Roberts 1999, on Welsh). A nice example where the extension of the 3sg seems to depend on syncretic conditions comes from so-called agreement weakening in Dutch (Adkema and Neeseman 2005, 2004). (Nexon this volume: § 33). When a 2sg pronoun follows the finite verb in inversion contexts, the verb carries a zero ending, however, when the subject pronoun appears in preverbal position, the zero ending is replaced by -t, which is identical to the 3sg agreement marker.

(i) a. Dagelijks loop-O jij met een hondje over straat.
daily walk-2sg you with a doggy over street
b. jij loop-t dagelijks met een hondje over straat.
you walk-2sg/3sg daily with a doggy over street

(Adkema and Neeseman 2004: 193)
drawn from the Alemanic data discussed in section 7.4.2, where it might be argued that phonemic syncrism is accepted to avoid number syncrism.  

In what follows, we explore whether it is possible to explain pathways of language change via attributing them to properties of first language acquisition. Focusing on two examples of paradigm leveling from Germanic (the loss of stem vowel alternations in the verb inflection of various Germanic languages and the rise of the so-called Einheitsplural in Alemanic), we argue that the rise of syncratic forms can be attributed to learning strategies that the child applies to the input he/she receives in case the linguistic evidence is ambiguous or not sufficient to trigger a certain property of the grammar. In particular, it is claimed that the acquisition of phonological exponent categories is shaped by (i) a strategy to select stem forms which signal phonemic contrasts in the most unambiguous way and (ii) a strategy which aims at minimizing the number of features/elements stored in the lexicon.

### 7.4.1 Loss of vowel stem allomorphy in Germanic

Analogical leveling expands the domain of more regular forms, replacing more specified/forms by less specified/forms. A typical example of analogical change comes from the loss of stem vowel alternations in the development of the English past tense forms, as shown in Table 7.18 for the verb to drink.

In Old English, agreement distinctions in the past tense were not only marked by different agreement suffixes, but also by alternations of the verb's stem vowel. However, in the historical development of the relevant forms, the vowel changes were lost and drank surfaced as the only past tense form of the verb drink with the stem vowel

<table>
<thead>
<tr>
<th>Old English past tense forms</th>
<th>Expected Modern English past tense forms</th>
<th>Actual Modern English past tense forms</th>
</tr>
</thead>
<tbody>
<tr>
<td>drank</td>
<td>drank</td>
<td>drank</td>
</tr>
<tr>
<td>drunce</td>
<td>drunk</td>
<td>drunk</td>
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<tr>
<td>drunce</td>
<td>drunk</td>
<td>drunk</td>
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<tr>
<td>druncon</td>
<td>drunk</td>
<td>drunk</td>
</tr>
</tbody>
</table>

(1998: 145) note that "Such ambiguities may constitute a pressures for the system, but every change in the system to overcome those deficiencies may result in new deficiencies in other domains. One kind of syncrism may be resolved, while, simultaneously, another kind of syncrism is introduced." They of syncrism may be resolved, while, simultaneously, another kind of syncrism is introduced. They of syncrism may be resolved, while, simultaneously, another kind of syncrism is introduced. They of syncrism may be resolved, while, simultaneously, another kind of syncrism is introduced. They of syncrism may be resolved, while, simultaneously, another kind of syncrism is introduced. They of syncrism may be resolved, while, simultaneously, another kind of syncrism is introduced. They of syncrism may be resolved, while, simultaneously, another kind of syncrism is introduced.

### Related conclusions can be perhaps be

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37 An alternative pathway for resolving syncrism is grammaticalization processes, which typically provide new, more specified segments replacing old, "worm-out" forms (cf., e.g., Fuß 2005, on the historical development of verbal agreement marking in a variety of languages).

38 Note that it seems that the relevant preferences may differ from language to language. For example, apart from pronominal forms, nominative and accusative have generally fallen together in Germanic. Langhjørn (1987) attributes the later development to a language-specific preference for distinguishing between core arguments (i.e., nominative and accusative) and other, peripheral syntactic features.

39 To be sure, there are many diachronic developments that lead to random patterns of syncrism which cannot be meaningfully related to any such "repair" tendencies. For example, Laksöper and Wunderlich
generalized to all person/number combinations. Thus we can observe the rise of what Baerman et al. (2005) term "non-inflectedness", where the verb fails to signal any inflectional distinctions whatsoever (apart from tense). However, while the loss of the person/number suffixes can presumably be attributed to phonological erosion, it is quite unlikely that the loss of stem vowel alternations is amenable to such an analysis since it is generally assumed that phonological erosion affected only non-stressed final syllables, but crucially not the verb stem in the history of English.

Similar changes affected the verb's stem vowel in the history of Yiddish present tense forms, where the 2nd and 3rd singular forms of 'to dig' and the plural forms of 'to know' have been changed to match the relevant verb stem found in the 1sg: cf. Table 7.19 (see Albright 2002a for detailed discussion).

From Table 7.19 it becomes clear that the process of analogical leveling led to the loss of agreement distinctions in the paradigm. In the case of 'grbn 'to dig', the changes conflated the forms for 3sg and 2pl which were formerly distinct due to the existence of stem vowel alternation. Similarly, analogical leveling led to homophonous forms for 2sg and 2pl of 'v'im 'to know'.

In approaches such as Natural Morphology, it is assumed that changes towards more uniformity within a paradigm are driven by general cognitive (semiotic) principles such as economy and (morphotactic) transparency (cf. Wurzel 2001, Dressler 2003, for relevant overviews), approaching the 'agglutinative idea' where a single form corresponds to a single meaning/function (e.g. Wurzel's 1987 Principle of Uniformity and Transparency, or the Bi-uniqueness Principle, Dressler 2003; see also Mayerthaler 1981 and Leiss 1997 for discussion). Specifically, it is assumed that elemental meanings such as 'dig' or '[+hearer]' should have a unique and invariant exponent. Accordingly, learners/speakers tend to accept a change eliminating stem alternations in a given paradigm, in particular in cases where the relevant morphosyntactic distinctions are already encoded by other (more transparent/ iconic) means such as suffixation (as in the Yiddish example given in Table 7.19).41 Relatedly, paradigm leveling may be viewed in Optimality Theory as the reranking of uniformity constraints above marklessness constraints, perhaps in accordance with a high ranking in the initial state (McCarthy 1998, Hayes 2004). However, while such an account makes certain predictions concerning the likelihood of analogical leveling in general, it has not much to say about further specifics of the change. For example, it is left unclear which of the stem forms in Table 7.19 is more likely to gain a wider distribution, eventually driving the other form out of the grammar.

The latter question is taken up by Albright (2002a), who develops a restrictive theory of which stem forms may in principle be affected by analogical leveling. Assuming that the direction of analogical leveling is determined by the morphological structure that learners posit, Albright argues that learners scan the input for a 'maximally informative' base form, which allows them to generate the remaining (unknown) forms in the paradigm as accurately as possible. Albright defines the maximally informative verb base as the form that sustains the least serious phonological and morphological neutralizations—i.e. loss of (morpho-) phonemic contrasts in a certain stem form due to the affixation of inflectional material. He illustrates the effects of neutralization with the following example from Yiddish, shown in Table 7.20, where—similar to German or English—the suffixation of a marker consisting of voiceless obstruents requires that a root-final obstruent becomes voiceless as well. This phonological process leads to the neutralization of morphophonemic contrasts in the 2sg, 2pl, and 2pl, where it is not apparent from the affixed form whether the verb stem ends in an underlyingly voiced stop (as in lipst) or voiceless stop (as in zipst).

Albright (2002a, 2010) argues that of all base forms of the present tense paradigm, the 1sg has a unique status in Yiddish since it is much less affected by phonological neutralization than all other base forms. For this reason, the 1sg form is more

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**Table 7.19. Analogical leveling of stem vowel alternations in Yiddish**

<table>
<thead>
<tr>
<th>Present tense of</th>
<th>Present tense of</th>
</tr>
</thead>
<tbody>
<tr>
<td>grbn 'to dig'</td>
<td>v'im 'to know'</td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td>1sg</td>
<td></td>
</tr>
<tr>
<td>2sg</td>
<td>grbst</td>
</tr>
<tr>
<td>3sg</td>
<td>grbt</td>
</tr>
<tr>
<td>1pl</td>
<td>grbns</td>
</tr>
<tr>
<td>2pl</td>
<td>grbt</td>
</tr>
<tr>
<td>3pl</td>
<td>grbn</td>
</tr>
</tbody>
</table>

40 The stem vowel alternations that are morphologically expected in Yiddish verbal conjugation have different historical origins. With verbs such as grbn 'to dig' the vowel alternations were introduced by a phonological process (Umklaut) operative in Middle High German (note that Yiddish is assumed to have changed from this historical stage of German) which changed an a in the verb stem to an e in the 2 and 3 sg, due to the presence of an m in the suffixes of these stems (strong classes VI and VII). In contrast, vowel alternations between singular and plural forms (in the present tense) with verbs such as v'im 'to know' are of a more ancient origin. Verbs such as v'im are so-called preterite-present the present tense of which derives from Proto-Indo-European perfect forms where stem vowel alternations distinguished between singular and plural (Abraham).

**Table 7.20. Neutralization due to voice assimilation in Yiddish (present tense)**

| | | | |
|-------------------|-------------------|-------------------|
| lib 'to love'     | zipst 'to sit'    | t'span 'to mess with' |

<table>
<thead>
<tr>
<th>1sg</th>
<th>2sg</th>
<th>3sg</th>
<th>1pl</th>
<th>2pl</th>
<th>3pl</th>
</tr>
</thead>
<tbody>
<tr>
<td>lib</td>
<td>lipst</td>
<td>lipst</td>
<td>lipst</td>
<td>lipst</td>
<td>lipst</td>
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<tr>
<td>zip</td>
<td>zip</td>
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<td>t'span</td>
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<td>t'span</td>
<td>t'span</td>
<td>t'span</td>
<td>t'span</td>
</tr>
</tbody>
</table>

41 This raises a question concerning the loss of distinctive stem vowel alternations as for example in the history of English (cf. Table 7.18), where the relevant distinctions ([+hearer]) were not additionally expressed by inflectional suffixes. From the perspective of Natural Morphology, one might speculate that this change is linked to the complete loss of agreement marking (apart from 3sg) in the Middle English/Early Modern English period.
informative than any other base form as far as phonemic distinctions are concerned and can therefore be considered the maximally informative base form. For example, in the case of *līkōn 'to love', only the 1sg base form would serve to unambiguously differentiate the verb *līk-n from another possible (but nonexistent) verb *līp-n ending in a voiceless obstruent, or *līpo-n ending in a schwa.

In addition, Albright proposes an algorithm by which learners select a single surface form as the base form of the verb when he/she acquires a given inflectional paradigm (the so-called single surface base hypothesis). In the case of Yiddish, the algorithm favors the 1sg, because it retains distinctive phonological properties of the verb in question (number of phonemes, voicing, etc.) as unambiguously as possible. This form captures most contrastive information about verb roots, but it does not exhibit certain properties, such as the fact that gōmūm originally contained stem alternations in the 2/3sg. Since such forms cannot be predicted on the basis of the 1sg, it is hypothesized that they would need to be memorized as exceptions. Under these assumptions, analogical leveling comes about if for some reason the learner fails to store or retrieve the relevant forms. As a result, he/she will go on to use the over-regularized forms which will eventually replace the old irregular forms if the change gains a wider distribution in the community.42 In Yiddish, this kind of analogical leveling affected the present tense paradigm, in which the 1sg allomorph replaced the allomorphs found in all other slots in the paradigm (see Table 7.19 above).

A related but somewhat different change involves cases where analogy does not level stem allomorphy, but rather, reduces the inventory of inflectional affixes so that an underspecified form gains a wider distribution in a paradigm. This can be illustrated with a change that affected the plural forms in the verbal agreement paradigm of many Alemannic dialects, to which we now turn.

7.4.2 The rise of Einheitsplural in Alemannic

Most Alemannic dialects spoken in Switzerland and Southwest Germany exhibit a single syncretic plural agreement formative /-e(n)/, which does not signal any person distinctions—so-called Einheitsplural (common plural). Table 7.21 shows the full inventory of agreement affixes in the present indicative.

The suffix used in the Einheitsplural originated from the original 3pl -ent (via vowel reduction and, in some varieties, deletion of inu). Its development is an instructive example of an analogical change which gradually expands the domain of a certain formative in a paradigm, leading to a loss of distinctive inflections. Table 7.22 gives a rough overview of the different historical stages that eventually led to the paradigm in Table 7.21.

The rise of the common plural began in the Old High German (OHG) period. As illustrated in the first column of Table 7.22, it was preceded by a series of other changes that affected the inventory of person/number markers:

42 To be sure, further questions arise concerning the diffusion of analogical leveling in a speaker community. However, these issues are orthogonal to Albright’s overall approach, which is not primarily concerned with sociolinguistic matters such as diffusion, but rather deals with the linguistic question of which forms may be affected by analogical leveling.

43 In some Bavarian varieties, syncretism of 3sg with 2pl was eliminated by a reanalysis of the 2pl subject clitic -se, which gave rise to a new verbal agreement marker 2pl -e(n) (cf. Wiesinger 1989, Weiß 1988, Fall 2005).

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**Table 7.21. Einheitsplural in Alemannic (present indicative)**

<table>
<thead>
<tr>
<th></th>
<th>1sg</th>
<th>2sg</th>
<th>3sg</th>
<th>1pl</th>
<th>2pl</th>
<th>3pl</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>-&gt;</td>
<td>-&gt;</td>
<td>-&gt;</td>
<td>-&gt;</td>
<td>-&gt;</td>
<td>-&gt;</td>
</tr>
</tbody>
</table>

**Table 7.22. The development of Einheitsplural (pres. ind. strong verbs and weak verbs of class I)**

<table>
<thead>
<tr>
<th></th>
<th>Early OHG (around 900)</th>
<th>OHG/Nothker (10th-11th century)</th>
<th>MHG/Alem. (13th-15th cent.)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1sg</td>
<td>-u</td>
<td>-o</td>
<td>-e(a)</td>
</tr>
<tr>
<td>2sg</td>
<td>-is -&gt; -ist</td>
<td>-est</td>
<td>-e(t)</td>
</tr>
<tr>
<td>3sg</td>
<td>-it -&gt; -et</td>
<td>-et</td>
<td>-e(t)</td>
</tr>
<tr>
<td>1pl</td>
<td>-mūs -&gt; -en</td>
<td>-en</td>
<td>-ent</td>
</tr>
<tr>
<td>2pl</td>
<td>-et</td>
<td>-ent</td>
<td>-ent</td>
</tr>
<tr>
<td>3pl</td>
<td>-ent</td>
<td>-ent</td>
<td>-ent</td>
</tr>
</tbody>
</table>
intellige), cf. Steinmeyer and Eduard (1879: 130f.). Thus, it appears that for reasons that remain unclear (but see note 45 below for some speculations), 3pl forms came to be used as plural imperatives. This innovation is mostly confined to Alemanic varieties of OHG, although there are also some relevant examples in the OHG Tatian (in particular in passages attributed to scribe γ, who is often considered to be an Alemanic speaker; cf. e.g., Sievers 1961; but see Moulton 1944 for a differing view). Considering the following example, where the prenasalized variant is used to render a 2pl imperative while the following 2pl indicative forms exhibit the original ending /-u/: (23) infahent then helagon geis; then ir forlazet sunta, receive-2PL IMP the holy ghost those you.2PL forgive-2PL IND sins then uerudent siu forlaxono, inti then ir siu bihabet. those will be they forgiven and those you.2PL them retain-2PL IND bihabeto sint. retained are

Lat. Accipite Spiritum sanctum; quorum remiseritis peccata, remittuntur eis, et quorum retineritis, retenta sunt. 

‘Receive the holy spirit. If you [pl] forgive the sins of any, they are forgiven them; if you [pl] retain the sins of any, they are retained.’

(Tatian, 232.6)

At least in the Tatian, there is evidence that the extension to indicative forms first affected strong verbs and preterite-presents (cf. Moulton 1944: 331). In the work of Notker (Alemanic OHG; 950–1022), the new 2pl formative is found consistently in all tenses and moods. Then, in the Middle High German (MHG) period, -nt spread to 1pl (formerly -en), leading to the complete loss of person distinctions in the plural part of the verbal agreement paradigm.

Traditionally, the rise of the common plural is analyzed as an analogical change extending the domain of the 3pl ending (cf., e.g., Weinhold 1963; Braune and Reifenstein 2004: 263). Fuß (2010) offers an alternative explanation, in which the relevant changes were triggered by an acquisition strategy that aims to minimize the number of elements/features mentioned in the lexicon, which, as a side-effect, led to a more transparent relation between form and function/meaning.

7.4.2.1 Extension of 3pl -ent to 2pl Table 7.23 lists the forms of the verbal agreement paradigm of OHG before and after the extension of 3pl to 2pl. Note that /-e/ is merely a theme vowel, which is presumably realized as schwa, at least in later stages of German.

Fuß (2010) argues that the extension of 3pl /nt/ to 2pl was part of a major reanalysis that affected the form–function pairings in the verbal agreement paradigm of early Alemanic. The proposed analysis is based on feature decomposition (adopting a binary system of person features [±SPEAKER] and [±THIRD]) and morphological

Table 7.23. 2pl /-et/ → /-ent/ (pers.ind) in OHG/Early Alemanic (Notker)

<table>
<thead>
<tr>
<th>Paradigm after conflation of 3sg, 2pl</th>
<th>Paradigm after reanalysis</th>
</tr>
</thead>
<tbody>
<tr>
<td>1sg -o</td>
<td>-o</td>
</tr>
<tr>
<td>2sg -est</td>
<td>-est</td>
</tr>
<tr>
<td>3sg -nt</td>
<td>-et</td>
</tr>
<tr>
<td>1pl -en</td>
<td>-en</td>
</tr>
<tr>
<td>2pl /-ent</td>
<td>/-ent</td>
</tr>
<tr>
<td>3pl /-ent</td>
<td>/-ent</td>
</tr>
</tbody>
</table>

subanalysis, where the inflectional markers listed in Table 7.23 are split up into smaller units of exponent (cf., e.g., Müller 2006a, b on German). Under these assumptions, the extension of 2pl /nt/ to 2pl can be analyzed as the result of two separate changes.

First, it is assumed that the earlier innovation of 2sg -nt (inherited ending /-et/ + onset of subject clitic thi) made available a reanalysis of the segment /-t/ as a realization of the feature [+SPEAKER], since final /t/ appears in all 2nd and 3rd person forms (cf. Table 7.23). In an additional change, the prenasalized plural imperative formative /-nt/ (presumably originating from 3pl, see above) was extended to all 2pl contexts (/-u/ → /-nt/). Note that after this extension leading to nasalization of all 2pl forms, the segment /nt/ could be analyzed as being uniquely paired with the inflectional feature [+pl], since it occurs in all plural forms and nowhere else. The result of these changes is illustrated in (24), where the inflectional marker /-ent/ is analyzed as a combination of smaller phonological exponents.

45 This leaves us with the question of why 3pl forms came to be used as plural imperatives in the first place. Since this change predates our earliest written records, we can only offer some speculations as to what factors might have promoted the nasalization of /-u/ in imperatives. Weinhold (1963) observes that nasalization seems to be a common strategy across Alemanic to reinforce/strengthen inflectional formatives. Another relevant example comes from the past endings of weak verbs such as lebb-ent/-t 'live-past, 3sg' or erweach-ent/-t 'invoke-past, 3sg' (Weinhold 1963: 361), where a homorganic nasal was added to the original dental suffix (see Osthoff 1983, 1995, and Selk 2005 for discussion of other cases of spontaneous nasalization across the world’s languages). However, as pointed out by an anonymous reviewer, this raises the question of why this strategy affected 3pl imperatives, but not other forms such as 3sg (although one might argue that this option was blocked because it would have obliterated the number opposition between 3sg and 3pl). Another potential avenue one might pursue is to assume that the extended, prenasalized form was coined in analogy to the difference between long and short agreement endings found in 1pl contexts, where the long form /-en/ occurs in inversion contexts with empty subjects (a configuration similar to imperatives), while the short variant /-e/ is found elsewhere.

46 A decomposition analysis requires that the relevant inflectional head may split up into several insertion sites prior to the insertion of phonological exponents (Passow, cf. Noyer 1995). Assuming that Vocabulary Insertion discharges features of the underspecified morpheme, exponents compatible with (the remaining) feature set may be inserted as long as there are features left that can be discharged. See Müller (2006b, c) for a related analysis of the verbal inflection of Standard German.
Thus, it appears that widening the scope of the prenasalized marker /-nt/ to all tenses and moods gave rise to a more transparent relationship between form and function/meaning via creating a phonological exponent which was uniquely paired with the feature [+pl] (compare the shaded line in Table 7.24).

The development of the new 2pl marker seems to be in line with functionalist notions such as the Bi-uniqueness Principle of Dressler (2003) and conditions on morphological change proposed in Mayztherl (1980, 1981) or Wurzel (1987). According to Fuss (2010), however, the same effect can be modeled in purely formal terms if we assume that the acquisition of phonological exponents and their feature specifications is subject to the following constraint (cf. Halle 1997: 420; see Calabrese, 1998: 93, for related considerations; see also section 7.3.3 above):47

(25) \textbf{Minimize Feature Content}

The number of features mentioned in the Vocabulary [i.e. in the lexicon] must be minimized.

The principle in (25) requires that learners acquire the most economical lexical inventory that is compatible with the input they are exposed to. This has the following two consequences for the acquisition of phonological exponents and their featural properties. First, the set of lexical entries/Vocabulary items stored in the lexicon consists of the minimal number of formatives required for generating the input. Second, each inflectional marker is associated with the most economical feature specification compatible with the input data. In other words, the learner acquires the minimal set of feature specifications that is necessary for deriving the distribution of a given phonological exponent/Vocabulary item.

Under these assumptions, we can devise the following scenario for the rise of the new syncritic 2pl/3pl formative. Assuming that nasalization of 2pl imperatives led to variation in the input between 2pl /-et/ and /-ent/, the workings of (25) tipped the scales in favor of the more economical system of underlying feature specifications given in the last column of Table 7.24. As a result, learners 'grammaticalized' the reinforced form as new regular 2pl/3pl endings, leading to obsolescence of the old 2pl variant /-et/.

Note that as a side-effect, the desire for an economical inventory of exponents may also lead to a more transparent relation between form and function. In particular, if inflectional markers are decomposed into smaller units of exponents as in (24), selecting smaller units of exponents is more likely, inasmuch as it leads to a one-to-one relation between form and feature specifications. However, in contrast to functionalist accounts, this particular result is not attributed to a generation-spanning drift that pushes languages towards an 'agglutinative ideal'. Instead, the development of (more) transparent pairings of sound and meaning is treated as an (possible) outcome of the way individual learners assign feature specifications to phonological exponents (promoting the particular reanalyses that gave rise to (24)).

7.4.2.2 The rise of a general plural marker: extension to 1pl Between the thirteenth and fifteenth centuries, /-e/nt/ evolved into the general plural marker for all persons, replacing 1pl /-e(n)/ (cf. Weinhold 1963: 365, Schirmersenski 1962: 521ff., Besch 1967: 310ff., Paul 1998: 240). Table 7.25 lists the relevant forms (with theme vowels; /e/ = schwu).

The extension of /-nt/ to the 1pl can be connected to two other changes that altered the make-up of the verbal agreement paradigm of Alamannic. There is reason to believe that the changes affecting the shape of the exponents of the 1sg and 2sg required a major reorganization of the form-function pairings in other parts of the paradigm. More precisely, what we can observe is that the extension of /-nt/ to the 1pl was accompanied by the loss of final /-e/ in 2sg contexts (presumably due to phonological erosion) and nasalization of 1sg giving rise to a new 1sg exponent /-e(n)/.48

Table 7.25. 1pl /-en/ → /-ent/ (prs.ind) in OHG/Alemannic (~13th-15th century)

<table>
<thead>
<tr>
<th>Old paradigm</th>
<th>New paradigm</th>
</tr>
</thead>
<tbody>
<tr>
<td>3sg /-et/</td>
<td>/-nt/</td>
</tr>
<tr>
<td>2sg /-ent/</td>
<td>/-nt/</td>
</tr>
<tr>
<td>3sg /-ent/</td>
<td>/-nt/</td>
</tr>
</tbody>
</table>

Further support for a principle such as (25) comes from psycholinguistic experiments reported on in Clabon, Eisenbeis, Haiden, and Svennenhult (2001), which suggest that more specified inflectional markers are more difficult to process than less specified forms.

47 Further support for a principle such as (25) comes from psycholinguistic experiments reported on in Clabon, Eisenbeis, Haiden, and Svennenhult (2001), which suggest that more specified inflectional markers are more difficult to process than less specified forms.

48 2sg /-ot/ → /-nt/ after /-ot/ /-nt/ in most varieties; cf. Weinhold (1963: 365), Schirmersenski (1962: 520f.), Weber (1987: 174). The nasalization of 1sg forms is traditionally analyzed as an extension of the relevant 1sg ending of the weak verbs of classes II and III; cf. Schirmersenski (1962: 519). Thus, the new nasalized forms of class I are presumably the result of analogical extension. Alternatively, we might suppose that they were coined by adult speakers to reinforce/strengthen the original 1sg form, which consisted merely of a schwu (see also note 45).
Interestingly, it seems that there is a systematic connection between the three changes highlighted by shading in Table 7.25. First of all, we can observe that the phenomenon of common plural is also a characteristic of Low German dialects: Western Low German dialects exhibit the form */-q/1, while */-an/ is the typical ending found in Eastern Low German dialects (cf. Schirmur, 1962: 543; for details). Interestingly, many of these dialects also exhibit loss of final */-v/ in 2sg forms, similar to Alemannic (Schirmur, 1962: 544). Second, Bade (1967: 301) observes that there is a geographic connection between the extension of the Einheitsplural to 1pl and the presence of the 1sg form */-q/1, in the sense that in the fifteenth century, 1sg */-n/ is found in particular in those dialectal areas that also participated in the development of the Einheitsplural. Thus, we may conclude that the joint appearance of (i) the changes affecting the 1sg/2sg forms and (ii) the rise of the Einheitsplural is not coincidental.

First of all, note that due to the loss of final */-u/ in 2sg, */-v/ could no longer be analyzed as a marker realizing the feature [-SPEAKER]; otherwise, we would expect */-v/ to occur in all 2nd and 3rd person contexts. Thus it appears that this change not only affected the shape of 2sg forms, but also had a considerable impact on the whole system of feature distinctions that underlie the verbal agreement paradigm. In a similar vein, nasalization of 1sg leading to 1sg */-en/ not only altered the shape of 1sg forms, but also affected the system of form-function pairings in the plural part of the paradigm since */-n/ could no longer be straightforwardly analyzed as the realization of [+plural]. After */-v/ and */-u/ could no longer be paired with unique feature values, the */-n/ suffix could no longer be decomposed. This would have favored analyzing */-n/ as a realization of [-SPEAKER, +plural], which, under pressure to minimize feature content, could have been simplified and extended to all [+plural] contexts. With */-n/ analyzed as a pure plural marker, */-v/ is freely analyzed as the elsewhere marker:

\[
\begin{align*}
\text{[SPEAKER]} & \leftrightarrow /-n/ \\
\text{[HEARER]} & \leftrightarrow /-l/ \\
\text{[+plural]} & \leftrightarrow /-n/ \\
\text{elsewhere} & \leftrightarrow /-v/ \\
\end{align*}
\]

Furthermore, syncretism of all plural forms is a system-defining trait of the relevant Alemannic varieties, affecting all paradigms, including highly irregular suppletive conjugations as in the case of sein 'to be' (1pl/2pl/3pl sind; Cécile Meier p.c.). This suggests that we are observing a system-defining syncretism, similar to 1pl/3pl in the verb inflection of Standard German. This metasynchronism of the plural forms may be captured with an impoverishment rule that deletes person features in the context of [+plural].

(27) Impoverishment in Alemannic (Einheitsplural)

\[
[\text{SPEAKER}], [\text{HEARER}] \rightarrow \emptyset / [+\text{plural}] \]

Due to (27), there is no need to posit additional number specifications for the exponents that realize person features. Under the assumption that Vocabulary Insertion is subject to the Elsewhere Condition, the forms 1sg */-n/ and 2sg */-v/ cannot be inserted in plural contexts, since they contain features not present in the relevant inflectional morpheme after impoverishment has taken place. Thus, it appears that the rise of person syncretism in Alemannic led to a highly economical inventory of inflectional markers where each phonological exponent is uniquely paired with a single syntactico-semantic feature.

A key feature of this account is that a bias for simpler representations may lead learners to posit maximally general, or perhaps even overly general (underspecified) representations for morphemes. An important area in need of further research is the formalization of how this learning bias can be embedded into an explicit theory of morphological learning. Pertsova (2007) provides a proposal in this direction, sketching an algorithm that discovers underspecified representations based on the occurrence of syncretism. We anticipate that implemented algorithms for learning—and perhaps also mislearning—morpheme distributions will be an important tool not only for understanding language change, but also for predicting which synchronisms speakers treat as systematic and significant.

7.5 Conclusion

In this chapter, we have provided a critical survey of current theoretical approaches to the phenomenon of syncretism, that is, mismatches between syntax and morphology where the morphology fails to mark a featural distinction that is syntactically relevant. We began this chapter by arguing that the distinction between coincidental and systematic patterns of syncretism is psychologically real. To support our case, we presented an overview of types of data showing that many cases of syncretism are systematic and merit linguistic analysis, including morphological, syntactic, and psycholinguistic evidence that speakers treat syncretism as linguistically significant.

50 It seems likely that the development of an impoverishment rule was preceded by a gradual development leading to underspecification of individual lexical items. At some point, the series of analogical changes tipped the scales in favor of an analysis in terms of impoverishment which expresses high systematic neutralizations (see Noyer, 1992: 124; cf. some discussion). Furthermore, since impoverishment typically leads to a reduction of features mentioned in the Vocabulary, we might also suppose that the rise of impoverishment is promoted by a principle such as Minimal Feature Content.

51 Later (purely phonological) changes led to the present-day paradigm (cf. Table 7.25): (i) cluster reduction of */-n/ to */-q/ (cross-linguistically a common change, which is usually attributed to a tendency to preserve the less sonorous element of the target cluster; cf. Obala 1991, 1999, Peter 2003); (ii) loss of final */-n/ in 1sg forms (in most varieties).

49 The extension of 2sg/3sg to 1pl was perhaps additionally promoted by the fact that nasalization of 1sg led to number syncretism of 1sg and 1pl, which seems to be generally dispreferred across languages (see above).

50
In section 7.2, we then turned to the question of how best to analyze syncretism theoretically, comparing various mechanisms for handling identity between forms/exponents (in non-accidental patterns of syncretism) that have been proposed in the literature. The discussion of current formal models of syncretism was organized around a particular data set, focusing on properties of verbal inflection in German to illustrate different modes of analysis. First, we demonstrated that traditional approaches in terms of underspecification + blocking can successfully capture many cases of syncretism in a more or less straightforward way by making reference to natural classes based on combinations of morphosyntactic features. However, it also became clear that more complex patterns of syncretism call for more powerful analytical tools such as impoverishment or rules of referral. In addition, we showed that Optimality Theory offers an alternative view of syncretism, in which syncretic forms may be selected on phonological grounds, overriding the morphologically expected forms. We then took a closer view at one particular OT approach put forward by McCarthy (2005, Optimal Paradigms), where different exponents are constrained to look alike by output-output faithfulness constraints that require surface realizations (e.g. of stems) to be identical.

Section 7.3 served to review typological evidence concerning the features most frequently involved in syncretism, as well as common and not-so-common patterns of neutralization across the world’s languages (single vs. multiple feature syncretism, polarity effects, directional syncretism, and the relationship between syncretism and portmanteau expression). In addition, we considered what factors characteristically trigger or condition syncretism. In particular, the discussion of typological aspects served to highlight strengths and weaknesses of the theoretical mechanisms introduced in section 7.2.

In section 7.4, we extended the empirical base against which theoretical models are tested by adding evidence from the history of languages. Here, we first gave a survey over cross-linguistically recurring patterns of language change that shape the historical development of inflectional paradigms. Based on a detailed discussion of the loss of stem alternations in Germanic and the rise of so-called Einheitsplural ‘common plural’ in the verbal agreement paradigm of Alemannic, we then argued that the relevant diachronic tendencies can be attributed to the workings of learning strategies that shape the acquisition of inflectional morphology.

8.1 Introduction

A large variety of processes have been discussed under the name of truncation in the morphological and phonological literature. In this chapter we discuss truncation as a form of morphological exponence, where a morphological category is realized through truncation. Given that the term ‘truncation’ refers to form rather than meaning, we begin this chapter with a definition of the formal side of truncatory processes.

The term ‘truncation’ is usually employed to refer to two different kinds of processes. Representative examples are given in (1) and (2).

(1) Spanish hypocoristics


<table>
<thead>
<tr>
<th>Base name</th>
<th>Hypocoristic</th>
<th>Preserved</th>
<th>Deleted</th>
</tr>
</thead>
<tbody>
<tr>
<td>Umberto</td>
<td>Beto</td>
<td>σφ</td>
<td>σ</td>
</tr>
<tr>
<td>Gilekide</td>
<td>Balo</td>
<td>σφ</td>
<td>σφ</td>
</tr>
<tr>
<td>Cristina</td>
<td>Tina</td>
<td>σφ</td>
<td>σσφ</td>
</tr>
</tbody>
</table>

(2) Koasati plurals, pattern 1


<table>
<thead>
<tr>
<th>Singular</th>
<th>Plural</th>
<th>Preserved</th>
<th>Deleted</th>
</tr>
</thead>
<tbody>
<tr>
<td>pitīf-īn</td>
<td>pit-li-n</td>
<td>σ</td>
<td>VC</td>
</tr>
<tr>
<td>atalak-īn</td>
<td>atal-li-n</td>
<td>σσφ</td>
<td>VV</td>
</tr>
<tr>
<td>akočof-īn</td>
<td>acočof-li-n</td>
<td>σσφ</td>
<td>VC</td>
</tr>
</tbody>
</table>

The data in (1) exemplify one of several patterns that derive hypocoristic forms in Spanish (see Piferos 1998, 2000, and references therein for an overview). The pattern

1 For helpful comments on this chapter we want to thank audiences at Rutgers University, New Brunswick, UMAQ, Montreal, the GGS conference 2009 at Leipzig and, especially, Ingo Pflug, Alan Prince, Jochen Trommer, and an anonymous reviewer.

2 There is also a pattern II, which is not discussed in this introduction. Cf. section 8.3 for details.
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