CLIPP

Christiani Lehmanni inedita, publicanda, publicata

titulus	
	Indirect coding
huius textus situs retis mundialis	
dies manuscripti postremum modificati	
	06.10.2013
occasio orationis habitae	
	15th International Morphology Meeting, Wien, 9.-12.2.2012
volumen publicationem continens	
	Rainer, Franz & Gardani, Francesco & Luschützky, Hans Christian & Dressler, Wolfgang U. (eds.), *Morphology and meaning. Selected papers from the 15th International Morphology Meeting, Vienna, February 2012*. Amsterdam & Philadelphia: J. Benjamins (CILT, 327)
annus publicationis	
	2014
paginae	
	97-124

Indirect coding

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Abstract

Morphologically and syntactically conditioned alternations indirectly code their conditioner. The distinction between such semantic information that is coded by a property of an expression and such semantic information that conditions and constrains a property of an expression brings rigor into linguistic description and makes us understand an important mechanism of interpretation and reanalysis of linguistic structure. The paper provides a theoretical basis for describing indirect coding both on the paradigmatic and on the syntagmatic axis, but then focuses on syntagmatically mediated coding.

1 Introduction[1]

The purpose of this contribution is to establish indirect coding as a concept necessary for grammatical description.[2] In particular, it intends to

- show what it means for meanings or functions to be coded indirectly
- provide a unified theoretical framework for indirect coding
- show how indirect coding may evolve and again become direct coding
- draw practical consequences for linguistic description.

The expression 'indirect coding' is not, as far as I know, a technical term in linguistics. It is therefore open to many interpretations. I will start by briefly characterizing the notion of coding, distinguishing between direct and indirect coding and relating these concepts to the paradigmatic and syntagmatic axes. Then I will pass on to illustrations with phenomena from different linguistic levels and languages. The diachronic perspective will show how indirect coding may develop into direct coding and vice versa.

1.1 Coding

A speaker who conveys a message codes some of it in terms of linguistic signs. Part of the remaining portion of the message may be coded non-verbally, by speech melody, by gestures or mimically. The rest will not be coded at all and will instead be left to inference. Such inferences, in turn, will partly be based on the linguistic structure of the message, partly on the current state of the speech situation, including the universe of discourse, the linguistic and extralinguistic context and the encyclopedic knowledge of speech act participants.

The notion of a **mapping** of a semantic representation onto a phonological representation can make sense only if the semantic representation is a representation of the language-specific

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[2] It is also necessary in phonological description; but that requires separate discussion.

signatum (= *signifié* in the sense of F. de Saussure). It is neither possible nor necessary for a speaker to map his thought onto a configuration of expression units. It is not possible because the set of associations involved in the thought in question is potentially infinite, and so is the set of inferences that the hearer may draw from what he understands. It is not necessary because much of what the hearer needs to know and to understand may be available to him from the above-mentioned sources. Thus, what the speaker does, instead, is

1. choose a subset of what he wants to convey for coding
2. structure this subset in terms of signs of the language system he is using (starting, in a top-down manner, from the semantics)
3. and map this subset onto expression units.

The sign tokens sent to the hearer are no more than cues that enable him to reconstruct what the speaker wants him to understand.[3]

Whenever the intended sense of a message is not an entailment of what is coded, we commonly speak of **indirect communication**. Consider E1, said by the front passenger to the driver of a car stopped at the traffic lights.

E1.   It won't turn greener.

Understanding such an indirect speech act involves all of the non-linguistic information mentioned above. This entire domain of indirect communication is not the subject-matter of the present analysis.[4] Instead, we will focus on cases of indirect coding that get conventionalized in the language system and consequently become relevant at the third step of what the speaker does.[5]

1.2 Direct and indirect coding

Linguistic elements occurring in a text are **actualizations** or instantiations of units belonging to the language system. They are selected from among virtual units of the system, but what are combined at the level of the text are actual units. The text bears a certain sense. The default expectation for the functioning of expression units is that each of them codes some semantic unit that makes some contribution to the overall sense of the message. We will call this **direct coding**, define it as in Proposition 1 and visualize it in Diagram 1.[6]

Proposition 1.   *Direct coding*

Expression unit E_i codes semantic unit S_i d i r e c t l y iff E_i and S_i correspond to the signans$_i$ and the signatum$_i$ of one language sign LS_i.

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[3] "there is ... no deterministic coding-decoding process, as all aspects of interpretation involve inference. The inferential process involved in communication is the creating of a context in which the ostensive act achieves relevance (makes sense)." (LaPolla 2003:114)

[4] In a sense, the whole activity of semiosis is indirect activity, since the sign works by the principle 'aliquid stat pro aliquo'.

[5] In accordance with this, the relation of coding will be said to obtain between an expression unit and a semantic unit, where the latter may be either a sense unit as part of the discourse or a signatum.

[6] Similar diagrams are used in Ronneberger-Sibold 1990. That article came to my knowledge only after my own was essentially ready. I take the considerable amount of overlap between the two articles as mutual corroboration.
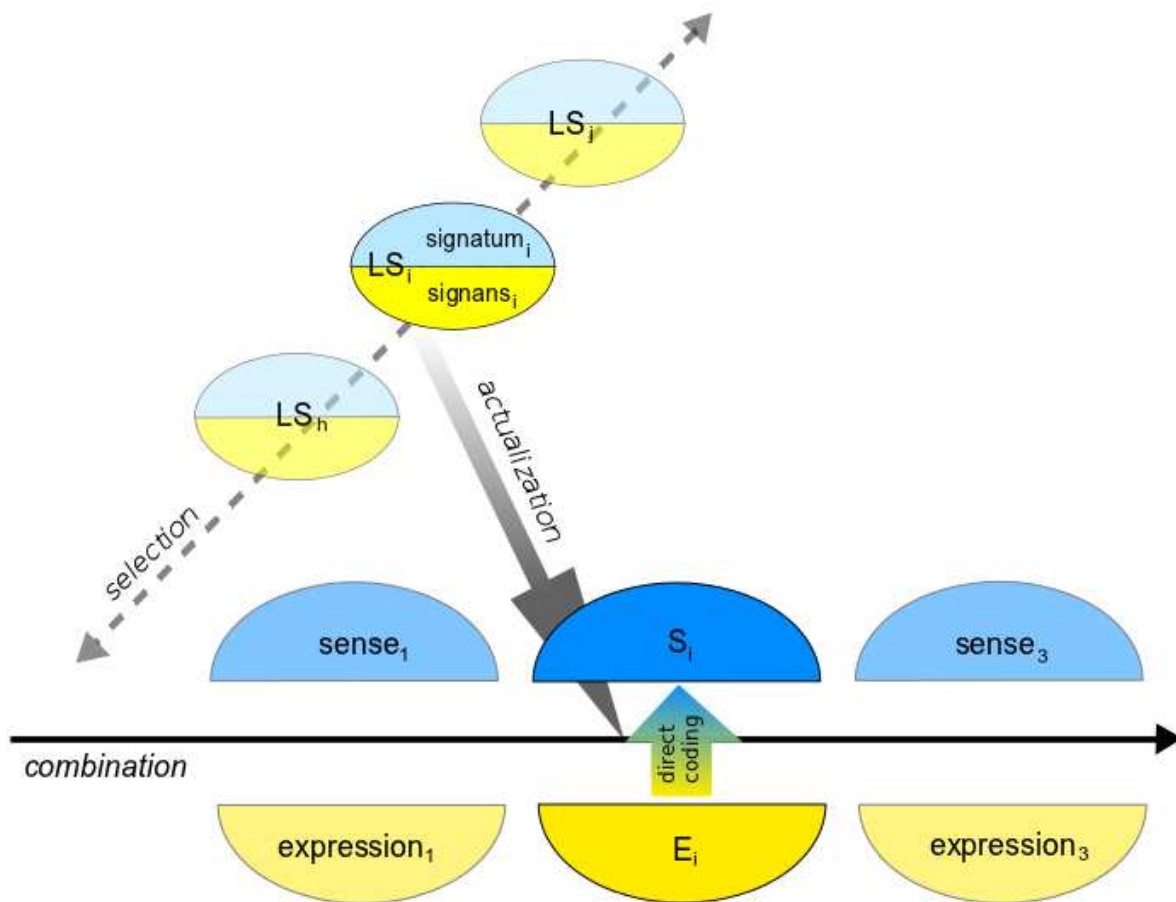
Diagram 1. *Direct coding*

Diagram 1 distinguishes the axis of selection, on which virtual units of the language system are arranged, from the axis of combination, on which actual units of the text are arranged. Three saussurean signs are shown on the axis of selection. The signans and the signatum of one of these (LS_i) correspond as closely as possible to an expression unit E_i and its sense S_i. E2 is an example from Latin:

E2.   a.   lup**us**
LAT   wolf:M.SG.NOM
             'he-wolf'

       b.   lup**a**
             wolf:F.SG.NOM
             'she-wolf'

The declension ending, *-us* in E2.a, *-a* in #b, is the expression unit E_i of Diagram 1. In the declension classes given and with a couple of exceptions, it codes (among other things) the gender (S_i) of the referent. In this, the association of E_i with S_i corresponds as closely as possible to the system unit LS_i, a declension morpheme whose signatum$_i$ includes the gender of a noun and whose signans$_i$ is /us/ or /a/, respectively. E_i appears on the noun (expression$_1$) whose referent (sense$_1$) is concerned and therefore directly codes the latter's gender (or more precisely, the gender of LS_h instantiated by that noun stem).

Indirect coding is a deviation from this default case. It is still a coding relation between an expression unit and a semantic unit, but instead of one language sign it involves two: the signans of one sign and the signatum of another sign. More precisely:

Proposition 2. *Indirect coding*

Secondary expression unit E_s codes primary semantic unit $S_{i \neq s}$ i n d i r e c t l y iff
a) E_s codes S_i and
b) E_s actualizes the signans of language sign LS_s, but S_i does not actualize the signatum of LS_s and instead instantiates some other (virtual or actual) semantic element.

Since the speaker's activity involves the axes of selection and combination, E_s may be related to that other element which provides the source for its sense either on the paradigmatic axis, i.e. in the language system, or on the syntagmatic axis, i.e. in the text. Since E_s is an actual unit, its paradigmatic relation involves signatum$_s$ of the LS_s instantiated by it and the latter's relation to some semantic domain other than its own. E3 illustrates indirect coding mediated by the paradigmatic axis.

E3.   a bitter experience

The expression unit *bitter* directly codes a signatum ("hard to process by the gustatory sense") which bears a relation of similarity to the sense actually meant in E3 ("hard to process psychically"). **Paradigmatically mediated coding** may be defined as in Proposition 3 and visualized by Diagram 2.
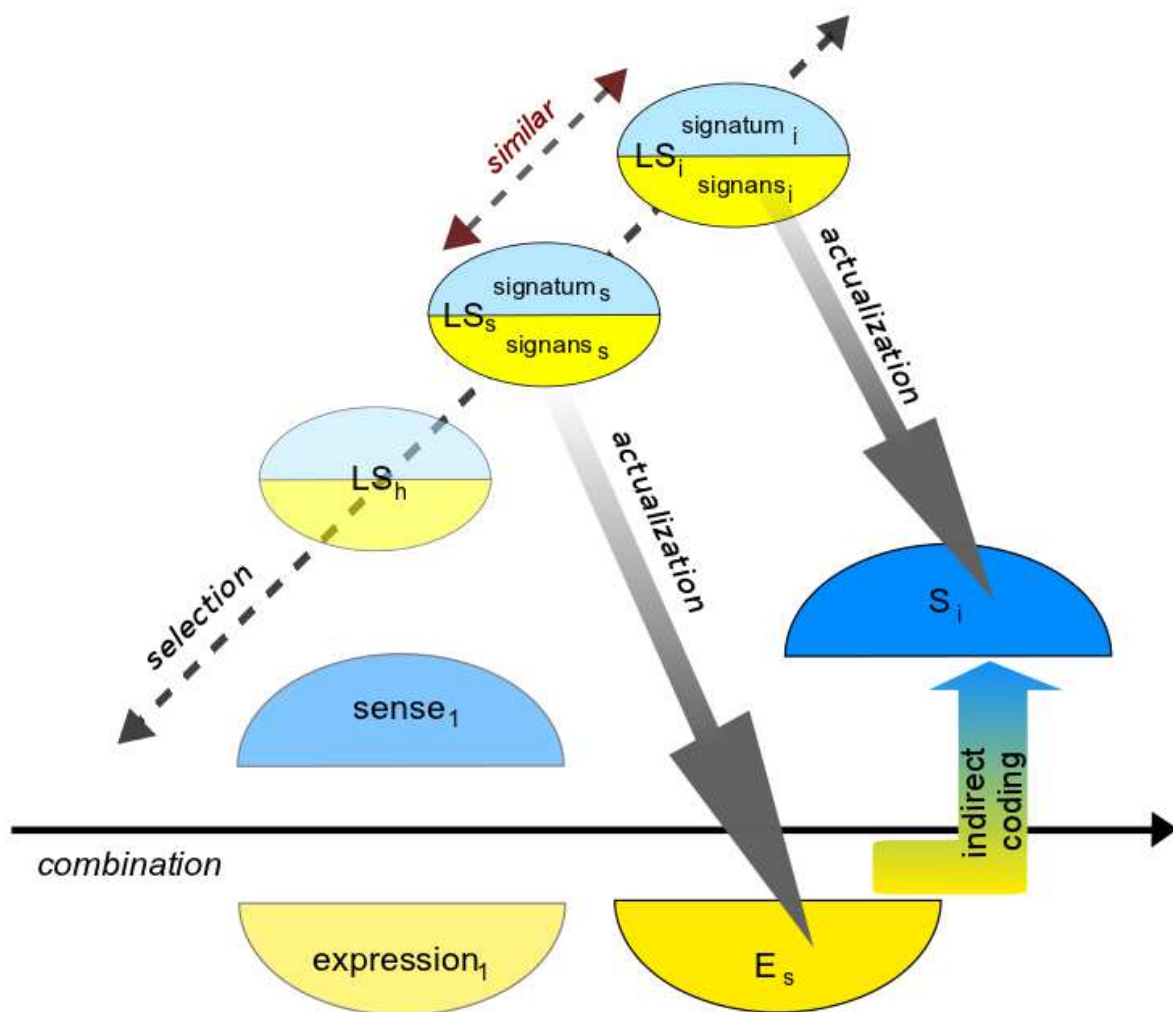
Proposition 3. *Paradigmatically mediated coding*

Secondary expression unit E_s codes primary semantic unit $S_{i \neq s}$ by paradigmatic mediation iff
a) E_s codes S_i and
b) E_s actualizes signans$_s$ of language sign LS_s whose signatum$_s$ is paradigmatically related to S_i.

Note that Proposition 3.b does not mention LS_i, as it is not required that we identify the English lexeme whose signatum is instantiated by the sense of *bitter* in E3. In that respect, Diagram 2 is a bit more simplistic than Proposition 3.

Diagram 2. *Paradigmatically mediated coding*

As may be gathered both from the example and from the definition, paradigmatically mediated coding is a hyperonym of **metaphor**.

We now turn to indirect coding mediated by the syntagmatic axis. E4 presents a classical example of a noun of common gender: Lat. *sacerdos* is either masculine or feminine:

E4.   a.   sacerdos   bon**us**
LAT   priest:NOM.SG good:**M**.NOM.SG
             'good priest'

      b.   sacerdos   bon**a**
             priest:NOM.SG good:**F**.NOM.SG
             'good priestess'

E4 directly contrasts with E2. In E4, the suffixes *–us* and *–a* still code the gender of the noun. However, they do not attach to that noun and instead to another expression unit which codes a property, which by itself is not specified for gender. Since the sense coded is associated with an expression unit on the syntagmatic axis – *sacerdos* in the case of E4 –, this kind of indirect coding is **syntagmatically mediated coding**. It is defined in Proposition 4 and visualized in Diagram 3:

Proposition 4.   *Syntagmatically mediated coding*

Secondary expression unit E_s codes primary semantic unit $S_{i \neq s}$ by syntagmatic mediation iff

a) E_s codes S_i and

b) E_s is syntagmatically related to E_i such that E_s actualizes signans$_s$ of LS_s and S_i actualizes signatum$_i$ of LS_i.

Diagram 3. *Syntagmatically mediated coding*
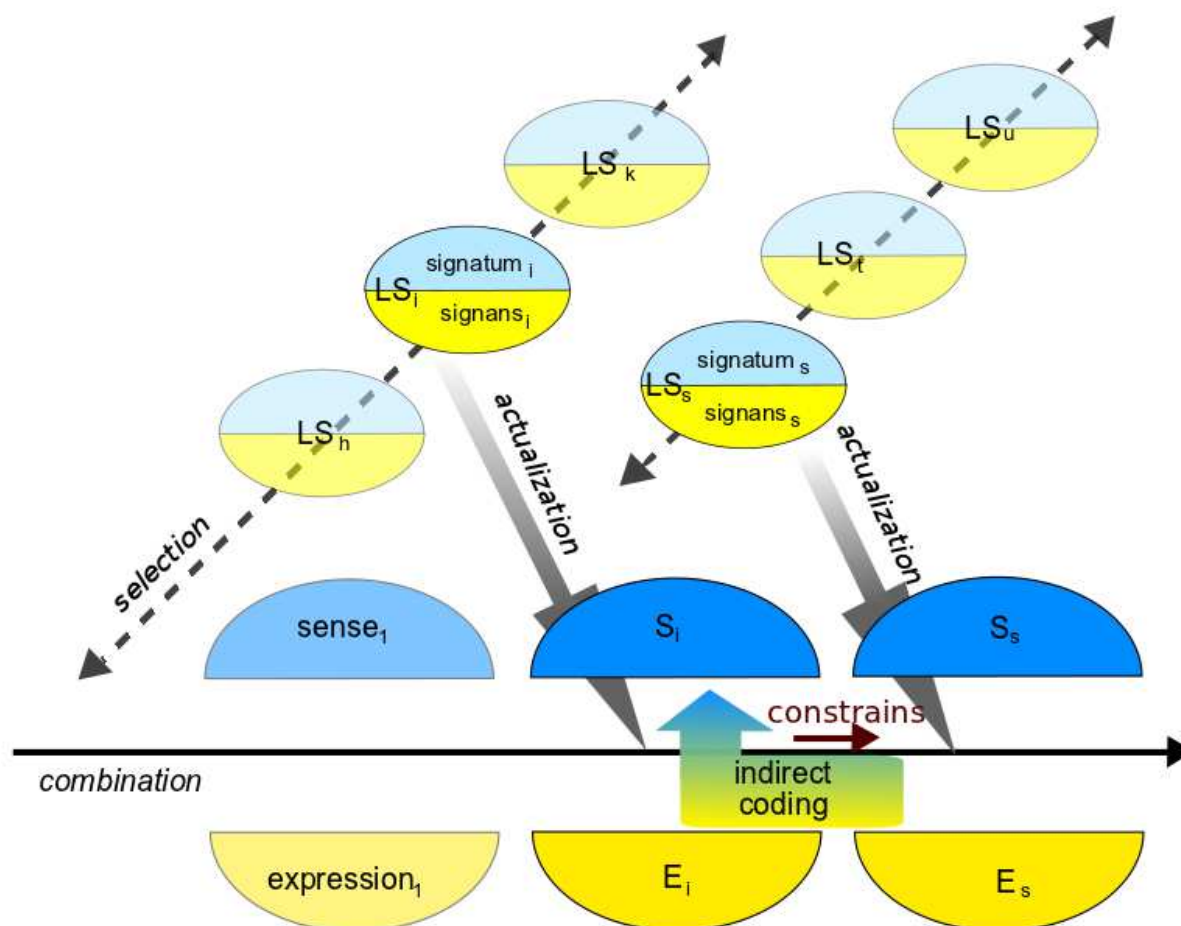
E_i (*sacerdos* in E4) and E_s (*-us/-a*) are related, but disjunct on the syntagmatic axis. The sign LS_i instantiated by E_i has a feature (gender, in E4) not coded by E_i. It is, however, indirectly coded by E_s. E_s does that because it bears an expression feature (the gender marked on the attribute in E4) which is conditioned by (the actualization of) LS_i. In other words, LS_i possesses a feature which constrains the form of E_s in this construction. The hearer, on the basis of the form of E_s and application of the constraint, infers that feature of LS_i.

The notion of **metonymy** has been expanded in the last decades to embrace any semantic change of an element induced by an element of its context. If that expansion is accepted, then Proposition 4 and Diagram 3 define a kind, and E4 is a case, of metonymy.[7]

Before we embark on individual case studies, the perspective taken here must be clarified. In linguistics as in language, we always have the alternative between a holistic and an analytic approach (Lehmann 2002, §1.1). The relationship of indirect coding is visible only under the

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[7] The term 'indexicality' used in Ronneberger-Sibold 1990, where E_s indexically determines S_i, refers to the same concept and may be more appropriate.

analytic approach. A holistic approach to E3 will determine that it means something like 'an experience hard to process psychically', a sense which this expression either assumes by analogy with similar expressions or even already possesses by idiomaticization. Likewise, E4.b just means 'good priestess', where the gender feature that is part of the meaning is coded in the NP as a whole. It is only when we take the analytic approach that we look at the inner paradigmatic and syntagmatic relations of the components of such a construction. This methodological point will become relevant in the morphological case studies of §3. The holistic approach there would lead us to use the word-and-paradigm model. We will forego this possibility because we are interested in the inner morphological structure of the expressions in question. The aim is to gain precision in morphological description.

2   Paradigmatically mediated coding

This section will analyze the Latin dative as indirectly coding a possessive relation and contrast it with the Yucatec possessive construction, which indirectly codes a benefactive relation.

2.1 Beneficiary and possessor

At the typological level, the two main benefactive strategies are a verbal strategy, in which a verb meaning 'give' serves as a benefactive light verb, and a nominal strategy, in which the beneficiary is coded as some kind of adjunct, often in the dative. We will start by the latter (cf. Lehmann et al. 2004, ch. 5.5). The strategy may be illustrated from Latin:

E5.   non   vitae   sed   scholae   discimus.
LAT   not   life:DAT.SG   but   school:DAT.SG   learn(PRS.IND):1.PL
           'we learn not for life, but for school' (Sen. *ep.* 106, 12)

E6.   Vatinius ...   aperuit   Dyrrachi   portas   Bruto
LAT   Vatinius:NOM.SG   open:PRF:3.SG   Dyrrachium:GEN.SG   door:ACC.PL   Brutus:DAT.SG
           'Vatinius opened the gates of Dyrrachium to Brutus' (Cic. *Phil.* 10, 13, 5)

While E5 features a benefactive adjunct with an intransitive verb, E6 shows it with a transitive verb. In the latter context, the beneficiary is often (though not in E6) interpreted as the possessor of the undergoer. Thus, E7 invites the inference that the bike belongs to the boy.

E7.   Linda   puero   bicyclum   refecit.
LAT   Linda:NOM.SG   boy:DAT.SG   bicycle:ACC.SG   repair\PERF:3.SG
           'Linda fixed the boy's bike.' (CL)

The same inference becomes irrefutable when the undergoer is represented by a relational noun. In E8, it is a body part, and the only possible interpretation is that the beneficiary coded in the dative adjunct is the whole to that part.

E8.   capiam   coronam   mi   in caput
LAT   get:PRS.SUBJ:1.SG   wreath:ACC.SG   me.DAT   in head(ACC.SG)
           'I will put a wreath on my head' (Pl. *Am*. 999)

This is the so-called 'external possessor' construction, wide-spread in European languages,[8] but also found elsewhere (cf. König & Haspelmath 1998). What is important at present is that structurally, this is not a possessive construction. A possessive relation is a direct relation between two entities, i.e. one not mediated by a situation core coded by a (non-possessive) verb. That means its prototypical manifestation is in nominal modification, as in E9.[9]

E9.   em, méum   caput   contemples
LAT   lo   my:ACC.SG.N head(ACC.SG) behold:SUBJ.PRS:2.SG
        "lo, look at my head" (Pl.*As*. 538)

In E7f, instead, there is no syntactic relation between the patient NP and the beneficiary NP that could be interpreted as a possessive relation. There are, in fact, no structural criteria at all by which the construction in E7f would be a possessive construction. The role of the participant coded as a dative adjunct in E7f is the beneficiary. Assignment of the possessor role to the same constituent is the result of an inference formulated as Proposition 5.[10]

Proposition 5.   *Inference from beneficiary to possessor*

If undergoer U of a situation S is affected by it and participant B is by that very fact indirectly affected by S, that is because B bears a possessive relationship to U.
a) This inference is just probable if U is not semantically relational, so that B may be the owner of U (as in E7).
b) It is indefeasible if U is relational, so that B is the whole of which U is a part (as in E8), or is a relative of U.

Proposition 5.a may be a pragmatic implicature, while #b is a semantic implicature.[11] Reframing this finding in terms of directness of coding, we may put it as follows: The possessive role of the referent of the dative adjunct in sentences like E7 is a case of paradigmatically mediated coding. A beneficiary and a possessor are semantically similar, and consequently the dative adjunct construction illustrated by E8 and the possessive attribute construction illustrated by E9 are paradigmatically related. If one wanted to force the analogy between paradigmatically mediated coding and metaphor, one might say that the dative adjunct construction is like a metaphor for the possessive construction.

Just as metaphors, indirect coding may become **conventional** under certain conditions, like those in E8. It may then be interpreted as direct coding. In the case at hand, linguists would then speak of a possessive dative and of an external possessor construction. Since, however, the structural features of the construction persist, it does not thereby become iconic. Conventionalization of indirect coding leads to counter-iconic constructions. The possessive dative is an extension of the benefactive dative, and we may safely hypothesize that it exists only in languages that also have a benefactive dative.

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[8] For instance, the German translations of E6 – E8 would be structurally analogous. The benefactive dative is not as productive in intransitive constructions, but there are a couple of examples like *ihr gehen die Argumente aus* (arguments run out on her) 'she runs out of arguments', *ihr laufen die Studenten weg* 'students break away from her'.

[9] While adnominal modification is the prototypical possessive construction in all languages, that construction is not the default for the body part relation in Latin. See Lehmann 2005.

[10] Levinson 1979 postulates as a principle that for each systematic set of constraints on the use of language, there will be a corresponding set of inference-procedures that will be applied in language understanding.

[11] "Non-conventional vs. conventional implicatures" in terms of Levinson 1983, ch. 3. It is, however, difficult to say whether Proposition 5.a has anything to do with conversational maxims, which are what Levinson's non-conventional implicatures revolve around.

Conventionalization of the dative adjunct in the function of a possessor may proceed to the point where the possessor role outweighs the benefactive role of the participant in question. This may be observed in E8, too. In terms of what is actually meant in the context in question, the referent of the dative adjunct is not really affected bene- or malefactively by the situation; it is just a possessor of the patient. The language overuses a coding strategy – the dative adjunct – beyond its proper locus – a participant indirectly involved in the situation, typically as a beneficiary – to cover a function – the possessor of another participant – that it does not code directly. In that way, the possessor role may end up as one of the semantic features of (the signatum of) the dative.

There are, however, strategies that directly code such latter functions, used by other languages. To these we now turn. Yucatec Maya (YM) has a possessive construction that may be illustrated by the translation equivalent to E7:

E10. t-u   yutskint-ah   u   kleetah xibpaal Linda
YM   PRFV-SBJ.3 repair-CMPL   [POSS.3 bike   boy   ]$_{NP}$ Linda
        'Linda fixed the boy's bike.' (CL)

The construction of E10 directly and iconically codes the possessive relationship of the boy to the bike. No benefactive relation is being expressed here. Nevertheless, it is a plausible pragmatic inference. It is only pragmatic because it depends on a variety of social and cultural factors whether a participant in a situation is seen as affected by it when this is not coded. E11 is a striking example:

E11. Máantats' táan u   t'ab-ik   u   kib   kili'ch   Anton.
YM   constantly PROG   SBJ.3 lighten-INCMPL   [POSS.3 candle   saint   Anton]$_{NP}$
        'Regularly he lightens candles for St. Anthony.' (CM 13)

The action depicted in E11 is obviously a culturally bound one, in principle one occurring both in the Mayan speech community and in such speech communities as the English and Latin speaking ones. In the latter, it would be coded in a benefactive adjunct construction; and while English uses the benefactive preposition as in the translation of E11, the Latin benefactive dative was already illustrated in E5 – E7. In this particular case, the question of whether the saint is seen as benefitting from the act of E11 is an empirical question;[12] and until it is answered, the example shows nothing more than Yucatec using a possessive construction where certain European languages would use a benefactive construction. Things are different for E12.

E12. k-u   luk's-ik   u   sahkil-il   máak-o'b
YM   IMPF-SBJ.3   leave:CAUS-INCMPL   [POSS.3 afraid:ABSTR-REL   person-PL]$_{NP}$
        'it took the fear from the people / it calmed the people's fear' (peek'_015.05)

Here the inference that the referent coded as possessor of the transferred object benefits from the act is a necessary one, given certain default psychosocial conditions. Even more, the participant in question is interpreted as occupying the source role of the trivalent predicate *luk's* 'take away', which may alternatively be coded as an indirect object, as in E13.

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[12] He probably is, because conventionally one lightens a candle for a saint in order to then proceed to addressing a request to him.

E13.	bíin	u	luk'-s-ik		teech
YM	FUT	SBJ.3	leave-CAUS-INCMPL		you

	le	iik'-o'b	k'aas-tak-o'b		a	kúuch-mah-o'	
	[DEF	wind-PL	bad-SBSTR.PL-PL		SBJ.2	load-PART.PERF-D2	]_{NP}

'in order to take away from you the bad winds with which you are loaded' (Chaak 079f)

The similarity between the possessor and the beneficiary roles and the resulting paradigmatic relation between the adnominal possessive construction of E12 and the indirect object construction of E13 are the same as in Latin. However, the inference from the former to the latter role is the inverse of the Latin inference:

Proposition 6. *Inference from possessor to beneficiary*

If undergoer U is affected by situation S and participant P is U's possessor, then P is indirectly affected by S.

a) This inference is just probable if there is no argument position in the core of S that might be occupied by P, so that no provision is made for a particular kind of involvement of P in S (as in E10f).

b) It is indefeasible if the core of S provides for an argument position that may be occupied by P (as in E12).

U's indirect affectedness is interpreted as benefaction or malefaction depending on the nature of S and on culture-specific conventions.

Yucatec Maya has a strategy that directly and iconically codes possessive relationships. It has no dedicated strategy for beneficiaries (nor for several other peripheral dependents, for that matter).[13] It thus codes such participant relations indirectly by extending the possessive strategy to such further uses, thereby stretching it beyond its proper locus. To the extent that constructions such as E12 become conventional, they are then sensed as directly coding such a participant relation. However, that does not remedy the basically counter-iconic character of the possessive construction when used to code a participant relation. On the contrary, that is the way a counter-iconic construction emerges by grammaticalization.

It may be seen that Proposition 5 and Proposition 6 are largely mirror images of each other. The lesson from this is that there are, at the cognitive, language-independent level, certain classes of situations that are complex in some specific way. In coding such situations, speakers reduce complexity by coding one of the features and leaving another to inference. If such features are interdependent as formulated in the pair Proposition 5/Proposition 6, then to a certain extent languages have an alternative of which feature to code and which feature to leave to inference.

Furthermore, the inference from what is coded to what is related on the paradigmatic axis may become conventional. Then the meaning first only coded indirectly may become the conventional meaning. Where metaphors are involved, one speaks of their conventionalization. Once the literal meaning becomes obsolete, the metaphor becomes a dead metaphor, and the erstwhile metaphorical meaning becomes (part of) the primary meaning, i.e., of its signatum. What initially was indirect coding has then become direct

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[13] More precisely: No such strategy is native to the language. Contemporary texts do feature benefactive adjuncts introduced by the preposition *ti'* translating Spanish *a* 'to'; but they are calques on the Spanish construction and expansions of the valency pattern seen in E13.

coding. The same may occur with the function of grammatical constructions. The possessive meaning of the SAE dative adjunct construction has become its conventional meaning whenever the possessum is relational; and the role of an indirectly affected participant is conventionally coded by a possessive construction in Yucatec Maya.

2.2 From paradigmatically mediated to direct coding

The discussion of the cases in §2.1 has dynamicized them in a diachronic perspective. In this perspective, they have a common structure which may be summarized as in Table 1. With the Latin example in mind, the variables may be instantiated as follows: LS_i is the genitive ($signans_i$) signifying a possessive relationship ($signatum_i$); LS_s is the dative ($signans_s$) signifying a benefactive relationship ($signatum_s$).

Table 1.   *Development of paradigmatically mediated coding*

phase		process	description
1		direct coding	Expression unit E_s codes sense S_s **directly** by virtue of language sign LS_s with $signans_s$ and $signatum_s$.
2		sense transfer	Secondary expression unit E_s evokes S_i on the basis of a similarity between $signatum_s$ and the semantic domain of S_i.
3	a	indirect coding	E_s **indirectly** codes S_i by paradigmatic mediation.
	b		S_i becomes a $signatum_i$ of $signans_s$
	c	distributed coding	As long as $signans_s$ retains $signatum_s$, $signans_s$ is now **polysemous** between $signatum_i$ and $signatum_s$.
4	a	functional shift ↓	The function of coding $signatum_i$ **shifts** definitively to $signans_s$ (on the paradigmatic axis).
	b	loss of original sense ↓	$Signatum_s$ is lost. E_s appears even after the loss of its original sense.
	c	direct coding	E_s now codes S_i **directly** by virtue of a language sign with $signans_s$ and $signatum_i$.

The transition from paradigmatically mediated coding to direct coding embodied in step 4b of Table 1 may be visualized by Diagram 4:

Diagram 4. *Paradigmatically mediated coding becomes direct coding*
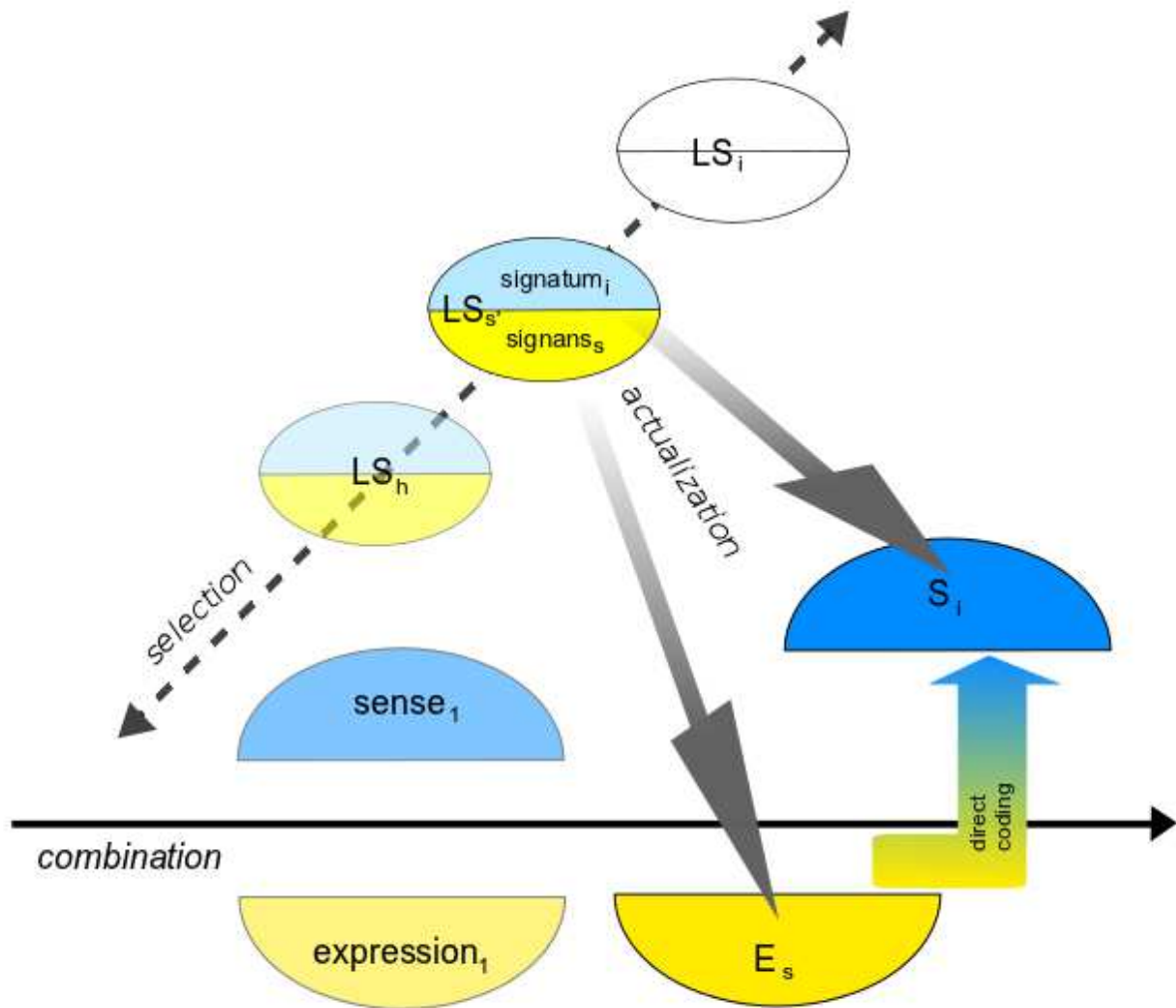
As Diagram 4 is meant to show, E_s no longer has the sense it formerly was associated with, and instead it directly evokes S_i, thus actualizing a modified system unit $LS_{s'}$ which pairs signans$_s$ with signatum$_i$.

3   Syntagmatically mediated coding

3.1 Constraints

In paradigmatically mediated coding, we are given an expression unit and infer, on the basis of some similarity between its meaning and a neighboring meaning, that the latter is meant. In syntagmatically mediated coding, we are given an expression unit and infer, on the basis of a contiguity relation between this unit and a neighboring unit, that the meaning of the latter must be present. The contiguity relation relevant here is a **constraint**. The general idea of a constraint may be characterized as in Proposition 7:

Proposition 7.   *Constraint*
   'X constrains y to the effect that P(y)' means the following:
   1. Y is something – typically, a human action or activity – which has a potential of unfolding according to inherent and/or logical possibilities.

2. Y is located in environment x, which imposes its own conditions on y, which limit or direct that unfolding.
3. P(y) is some property of (the distribution or shape of) y neither inherent in it nor derived from its purpose and instead conditioned by x.

In this situation, P(y) is a constraint imposed by x on y.

In the present context, only linguistic constraints are of relevance. Y may be a certain grammatical category. If it cooccurs syntagmatically with another category x, then x may constrain the development and appearance of y.[14] Grammar, the *ars obligatoria* (cf. Jakobson 1959:492), is a system of constraints which limit the choice of what the speaker may say and the ways he may say it. A phonological example from German is: If an obstruent (y in Proposition 7) is in the syllable coda (x), then it must be voiceless (P). A syntactic example from Spanish is: If a clitic pronoun (y) is the direct object of a finite verb (x), then it must directly precede it (P). Examples such as these have given rise to models of grammar which conceive of rules of grammar as constraints.

In terms of information theory, a message where at any given point just anything is possible contains no redundancy and is maximally difficult to decode. Every constraint limits the possibilities at a given point of a message and thus introduces redundancy into it. However, it also enhances the complexity of the linguistic system.

Properties possessed by item y just as a consequence of a constraint thus do not convey any information; on the contrary, they reduce the amount of information that might be given at that particular point of the message. If x syntagmatically conditions P(y) and that is the only way for P(y) to appear, then if we see P(y), we know it is due to x. In other words, the fact that a particular item obeys a certain constraint allows the inference that the contextual condition for the constraint is fulfilled.[15] In all those cases where the contextual condition is itself a feature of the linguistic expression, that inference is redundant because the respective property of the context is, *ex hypothesi*, coded and conveyed independently. For instance, given Turkish vowel harmony as a set of constraints on suffix vowels, then from the fact that the vowel of a certain Turkish suffix is back, the decoder may infer that the root vowel is back, too. But that inference is redundant, because by the time it is drawn, the root vowel itself is known.

The conditioning factor in a constraint need not, however, be expressed itself. It may, instead, be merely a grammatical or semantic feature of the context. Consider again the example of Turkish vowel harmony. The root vowel is one of the determining conditions; the word boundary is another one. Before we know that a certain morph is a suffix, we perceive its vowel and can compare it with the immediately preceding vowels. Depending on whether it harmonizes with them or not, the morph may be a suffix or follow a word boundary. Now this latter information is, in itself, not coded. In this perspective, the conditioned feature – vowel harmony – is not redundant, but instead allows us to infer grammatical information (Kabak et al. 2010).

As another example, let us look back at E4: an adjective attribute shows a certain gender which is conditioned by the gender of its head noun; but the latter is not perceptible itself. In such a case, the inference based on obedience to the constraint is not redundant, but generates information on the part of the decoder. That is the way syntagmatically mediated coding works. The following subsections are devoted to a few case studies. We will start by a

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[14] Context-sensitivity is an essential property of human language (Jakobson 1970:706f).

[15] That is why Ronneberger-Sibold (1990, §2.3) calls P(y) an index of x.

relatively straightforward case, French negation, and then look in more details at some more complicated cases: German metaphony and a couple of Yucatec Maya conjugation categories.

3.2 Grammaticalization of a reinforcement: French negation[16]

Standard and Vulgar Latin had a sentence negator *non*, which was used as shown in E14.

E14.   ille   non   vadit
LAT   that:NOM.SG.M   NEG   go(PRS):3.SG
        'that one does not go' (CL)

In Old French independent sentences, the negation was reinforced by "minimal quantifiers", viz. particles such as *pas* 'step', *point* 'point' etc., as shown in E15. Since their addition was optional, it was, in the initial phase, a real reinforcement.

E15.   il   ne   va   (pas)
OFR   he.NOM   NEG   go.PRS.3.SG   step
        'he does not go (a step)'

The reinforcing particles were constrained in the sense that they formed a paradigm and presupposed for their use a negation or a polarity context. In modern standard French (SFr), the constraint on these particles is tightened, as the negator *ne* now requires one of them, as shown in E16.

E16.   il   ne   va   pas
SFR   SBJ.3.SG   NEG1   go.PRS.3.SG   NEG2
        'he does not go'

Since postverbal *pas* does not reinforce anymore, it now indirectly codes negation. Like the other erstwhile reinforcers *personne*, *rien* etc., *pas* attracts the negation feature. Consequently, sentence negation in Standard French is discontinuous. One of the two parts of the split negation therefore becomes redundant. Since the postverbal particles distinguish the types of constituent negation from each other and from sentence negation, they survive, while the primary negator *ne* starts dropping out from the 17th century on. As a result, *pas* now codes negation directly. That is the situation of Modern Colloquial French (CFr) illustrated by E17.

E17.   il   va   pas
CFR   SBJ.3.SG   go.PRS.3.SG   NEG
        'he does not go'

We may formulate these observations in slightly more general, however as yet preliminary terms: In an initial phase, we have direct coding of $signatum_i$ (negation) by $signans_i$ (*ne*). In the next phase, LS_i starts conditioning LS_s (*pas*). Subsequently, $signans_s$ is perceived as coding $signatum_i$ indirectly and forming a discontinuous signans together with $signans_i$. The final phase involves a **syntagmatic shift** of the coding of $signatum_i$: with the loss of the former conditioner, $signans_i$, $signatum_i$ ends up being coded by $signans_s$.

3.3 Morphologization of a phonological alternation: German plural marking

The morphologization of a phonological alternation is its conversion into a morphological alternation. A well-known example is the morphologization of metaphony in certain

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[16] The same example is discussed, with a couple of corpus examples, in Ronneberger-Sibold 1990:187.

Germanic languages (cf. Wurzel 2004, Ronneberger-Sibold 1990, §2). This case is more complicated than the preceding one because the processes involving direct and indirect coding and, thus, morphological units, are rendered possible by the prior phonologization of an allophony, thus, a process involving phonological units. Table 2 analyzes this set of processes in terms of five phases.

Table 2.   *Morphologization of German metaphony*

phase	process	description	examples	
			singular	**plural**
0	allophonic alternation	Root vowel is fronted by phonological rule (metaphony = harmony with frontness of vowel in following syllable).		
	phonologization of allophones	Front round vowels remain even after loss of their former conditioners and, thus, become phonemes. Metaphony becomes a substitution of phonemes.		
1	direct coding	Nominal plural is coded by suffixes.	*liut* 'folk'	*liuti* 'folks'
2	constraint	Some plural allomorphs condition root vowel metaphony.	*gast*	*gesti*
			'guest'	'guests'
3	reanalysis ↓ indirect coding	Metaphony is taken to be conditioned by the function of the suffix (here: plural).[17] It thus codes plural indirectly.		
	reanalysis ↓ split coding	Coding of the grammatical function in question is reanalyzed as split (i.e. root vowel metaphony plus suffix).	*Gast* 'guest'	*Gäste* 'guests'
4	loss of former conditioner	The suffix in question is lost, but the root vowel metaphony remains.	*Vater*	*Väter*
	direct coding	The grammatical information conveyed by the suffix (here: plural) thereby becomes a grammatical feature conveyed by the front vowel of the root (i.e. metaphony now codes pluralization).	'father'	'fathers'

These are systematic phases which are not necessarily disjunct and in this particular order in this or analogous historical cases. The steps leading to the two subphases #3 are reanalyses, which as such are invisible. Given, however, phase 4, the linguist can ascertain that they must have taken place.[18] Phase 3 introduces "useful redundancy" (Dressler 1985:268f), which is

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[17] This is called a "morphonological intermediate phase" in Wurzel 2004:1602f.

[18] The first to explicitly recognize the reanalysis of a "non-significant distinction to a significant one" is Paul (1880:114).

presupposed and undone in step 4a. The loss of the erstwhile conditioner presupposes a **syntagmatic shift** of the coding of function S_i: it gradually shifts away from signans$_i$ and ends up being coded by signans$_s$. In the end, the initial phonological alternation becomes a morphological one, i.e. a morphological process coding the grammatical meaning or function signatum$_i$.

If one wishes to approach the notion of syntagmatically mediated coding in morphology from the perspective of familiar facts, one might conceive it as the state of affairs produced in phase 2b of Table 2. Finally, the morphologization which turns a phonological reflex into a morph involves a transition of indirect coding into direct coding.

Generalizing over the evolution of French negation and German plural marking, we may now set up Table 2 as a phase model for the transition of direct into indirect and then again direct coding on the syntagmatic axis:

3.4 Morphologization of an allomorphy: Yucatec Maya verb morphology

3.4.1 Transitivity marking

Modern Yucatec Maya has a conjugation category called 'status' which comprises, among other things, completive and incompletive aspect as well as subjunctive mood.[19] On transitive and intransitive verbs, these are marked by suffixes as shown in Table 3. For intransitive verbs, there are two conjugation classes based on agentivity, yielding the two allomorphs displayed in the right-hand column of Table 3. V represents a vowel that is subject to vowel harmony.

Table 3. *Status suffixes in Yucatec Maya*

valence status	transitive	intransitive
incompletive	-ik	-Ø / -Vl
completive	-ah	-nah / -Ø
subjunctive	-eh	-nak / -Vk

Any verb root is either transitive or intransitive. Most verb roots can be derived into a stem of the respective other transitivity class. Tables Table 4 – Table 6 show a verb form provided with the first person singular subject marker, *in* (the pronominal clitics of §3.6) in one set of status categories, *-en* in the other (cf. E18 below). These person markers are immaterial to the point and just added in order to illustrate with finite verb forms. In Table 4f, the verb is *bul* 'submerge'; in Table 6, it is *páak* 'weed'. The former is basic transitive, the latter is basic intransitive. The basic transitive verb is susceptible of two detransitivization operations, introversion (alias antipassivization), shown in Table 4, which blocks the undergoer slot, and deagentivization (alias anticausativization), shown in Table 5, which blocks the agent slot.

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[19] The present report is grossly simplified. For details, see http://www.christianlehmann.eu/ling/sprachen/ maya/gramatica/semas/verbo/verb_flex/estado.html.

Table 4. *Status conjugation of basic transitive root with introversion (conservative dialect)*

valence / status	transitive	intransitive
incompletive	in bul-ik	in buul
completive	in bul-ah	buul-nah-en
subjunctive	in bul-eh	buul-nak-en

Table 5. *Status conjugation of basic transitive root with deagentivization*

valence / status	transitive	intransitive
incompletive	in bul-ik	in búul-ul
completive	in bul-ah	búul-Ø-en
subjunctive	in bul-eh	búul-uk-en

In Table 6, *páak* 'weed' illustrates a basic intransitive verb. Instead of detransitivization, it undergoes a transitivization operation. And since this is an agentive verb, transitivization takes the form of extraversion, i.e. addition of an undergoer slot. The operator of this operation is the suffix *-t* appearing in the first column of Table 6.

Table 6. *Status conjugation of basic intransitive root with transitivization*

valence / status	transitive	intransitive
incompletive	in páak-t-ik	in páak
completive	in páak-t-ah	páak-nah-en
subjunctive	in páak-t-eh	páak-nak-en

As may be seen, valence (viz. transitivity vs. intransitivity) is marked twice in the forms of these tables, first by a root vowel change or – in the case of *páak* – by a stem suffix (*-t*); and second, by the allomorphy of the status suffixes. The question here is whether this is split marking or rather one of the markers is at the source, while the other represents indirect coding. Now as just said before, transitivity is inherent in verb roots. Whichever the conjugation class, one transitivity category is always paired with the root itself, while the other is clearly marked by a morphological change of the root or the stem. This suggests an analysis by which transitivity is a grammatical property of a stem which then conditions allomorphy in the status suffix, rather than transitivity being operated by the status suffix and conditioning changes in the preceding root or stem.

However, speakers especially of the 'zona maya' of Quintana Roo, which will henceforth simply be called the eastern dialect,[20] take advantage of the redundant marking appearing in the status suffix and dispense with the root vowel change. The conservative paradigm of Table 4 is replaced by the progressive paradigm of Table 7:

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[20] This is another gross simplification, because first there is more than one dialect in the eastern half of the peninsula and second, dialect differences interact in complicated ways with sociolects.

Table 7. *Status conjugation of basic transitive root with introversion (progressive dialect)*

status \ valence	transitive	intransitive
incompletive	in bul-ik	in bul
completive	in bul-ah	bul-nah-en
subjunctive	in bul-eh	bul-nak-en

The root form in the right-hand column of Table 7 is now the same as in the left-hand column, with the principle that every root is either transitive or intransitive breaking down for this root class. Consequently, what was a conditioned status allomorph (*-Ø, -nah, -nak*) here becomes a morpheme coding status and transitivity at the same time. In traditional terms, this is a case of morphologization of a conditioned alternation. In terms of the present framework, at the earlier stage represented by the western dialect, transitivity was coded directly in the root or stem, but indirectly by the conditioned allomorphy displayed by the suffixes. At the later stage represented by the eastern dialect, the indirect coding is no longer conditioned as soon as its condition, the different root transitivity, is lost; and so it becomes direct coding.

3.4.2 Aspect marking

In standard Yucatec Maya, the incompletive, completive or subjunctive status of a verb form is conditioned by the auxiliary or a superordinate verb. Completive status is triggered by the perfective auxiliary. The latter has two allomorphs depending on the transitivity of the stem, as exemplified by E18.

E18. a. t-in   bul-ah
YM   PRFV-SBJ.1   submerge-CMPL
           'I submerged it'

      b. h   buul-nah-en
          PRFV   submerge\INTROV-CMPL-ABS.1.SG
          'I submerged [no object]'

E19. buul-nah-en
      submerge\INTROV-CMPL-ABS.1.SG
      'I submerged [no object]'

The allomorph *h*, however, is often lost phonetically. In the resulting form, exemplified by E19, the completive aspect is the only indication of perfectivity.

In transitive verbs, the progressive aspect *táan* triggers incompletive status *–ik* on the verb, while the perfective aspect *t-* triggers completive status *-ah*. Again, the Western dialect is conservative and shows these forms as illustrated by E20.

E20. a. táan   in   bul-ik
YM   PROG   SBJ.1.SG   submerge-INCMPL
           'I am submerging it'

      b. t-in   bul-ah
          PRFV-SBJ.1.SG   submerge-CMPL
          'I submerged it'

However, both aspect auxiliaries contract with the following subject clitic. In the Eastern dialect, which is, again, progressive here, the progressive auxiliary reduces to its initial

consonant, so that the two combinations of auxiliary with subject clitic become homonymous, as shown in E21.

E21.   a. t-in   bul-ik
YM   ASP-SBJ.1.SG submerge-INCMPL
             'I am submerging it'

        b. t-in   bul-ah
            ASP-SBJ.1.SG submerge-CMPL
            'I submerged it'

Here the conditioned status marker is the only clue to disambiguating the aspect: Since completive status is only triggered by perfective aspect, the aspect conveyed by *t-* as in E21.b must be perfective. And since, from among the auxiliaries triggering incompletive aspect, the progressive is the only one starting with t-, the aspect conveyed by *t-* as in E21.a must be progressive. Thus, the status suffix, which coded aspect only indirectly at the outset, ends up coding it directly in the eastern dialect. At the same time, the change undergone by aspect marking in the eastern dialect is a case of morphologization of a conditioned allomorphy: a conditioned allomorph becomes a morpheme.

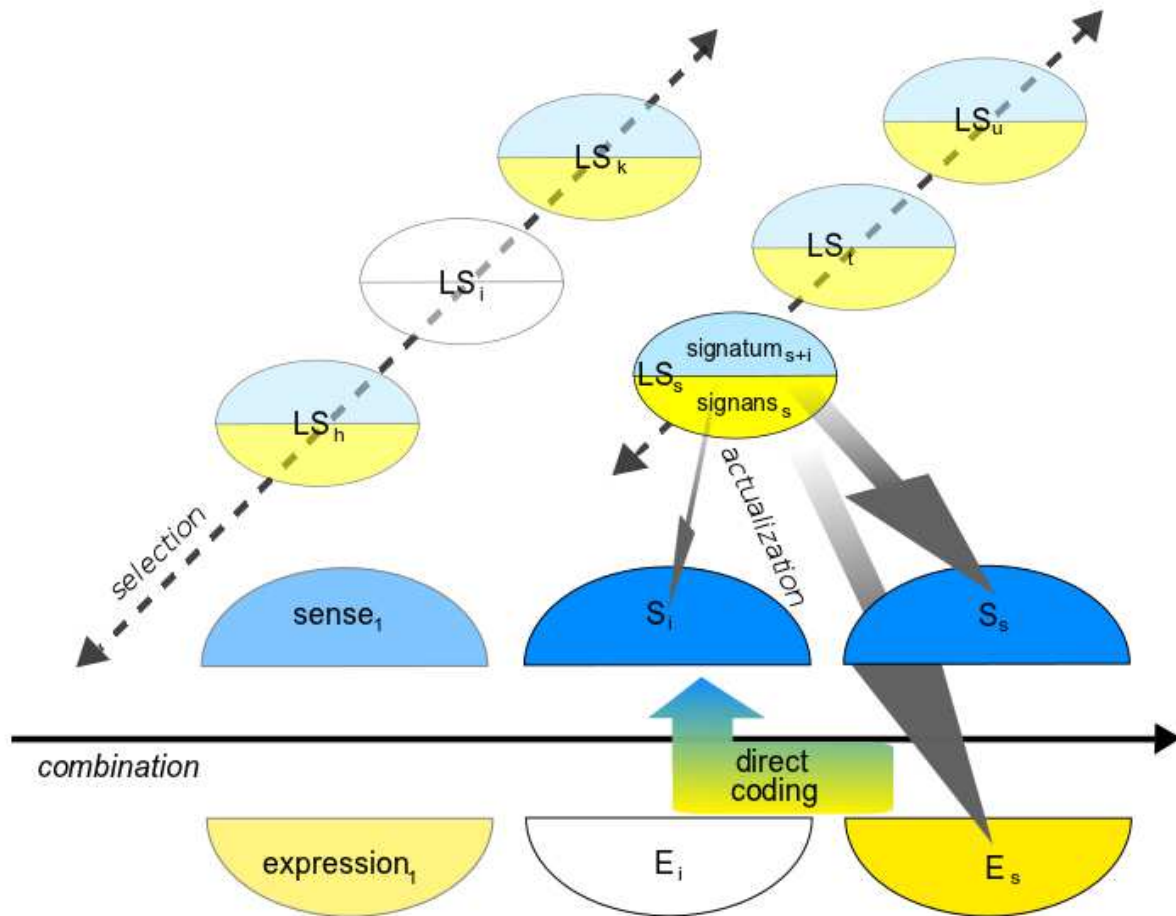## 3.5 From syntagmatically mediated to direct coding

The diachronic cases discussed in §3 up to here have a common structure which may be summarized as in Table 8:

Table 8.   *Development of syntagmatically mediated coding*

phase		process	description
1		direct coding	Expression unit E_i codes sense S_i **directly** by virtue of language sign LS_i with $signans_i$ and $signatum_i$.
2		constraint	Secondary expression unit E_s is conditioned by a constraint associated with LS_i.
3	a	reanalysis ↓	$Signans_s$ is reinterpreted as relating to $signatum_i$.
	b	indirect coding	E_s **indirectly** codes S_i by syntagmatic mediation.
	c	split coding	As long as $signans_i$ remains an expression feature of $signatum_i$, the coding of $signatum_i$ is now **split** between $signans_i$ and $signans_s$.
4	a	functional shift ↓	The function of coding $signatum_i$ **shifts** definitively to $signans_s$ (on the syntagmatic axis).
	b	loss of former conditioner ↓	$Signans_i$ is lost. E_s appears even after the loss of its former conditioner.
	c	direct coding	E_s now codes S_i **directly** by virtue of a language sign with $signans_s$ and $signatum_i$.

The transition from syntagmatically mediated coding to direct coding embodied in step 4b of Table 8 may be visualized by Diagram 5:

Diagram 5. *Syntagmatically mediated coding becomes direct coding*

3.6 From direct to syntagmatically mediated coding: Yucatec pronominal clitics

From the examples given, it might appear that there is a unidirectional drift from indirect to direct coding. Let us therefore look at a more complicated example from Yucatec Maya that runs counter to such an expectation. The two historical stages in question here are Classical Yucatec (ca. 1500 - 1800) and Modern Yucatec (contemporary). For more than a thousand years, the language has had pronominal clitics that cross-reference the possessor when preceding a noun, and the subject when preceding a verb. Table 9 shows the paradigm of Classical Yucatec. X represents the noun or verb marked for cross-reference.

Table 9.   *Pronominal clitics in Classical Yucatec Maya*

number person	singular	plural
1	in / w X	ak X
2	a / aw X	a / aw X-e'x
3	u / y X	u / y X-o'b

As may be seen, most forms have two allomorphs, the first appearing before consonant, the second before vowel as initial segment of X. The prevocalic allomorphs are written as prefixes. E22 illustrates Table 9 before a vowel.

E22. a. w-atan
CYM   POSS.1.SG-wife
            'my wife'

       b. aw-atan
            POSS.2-wife
            'your wife'

       c. y-atan
            POSS.3-wife
            'his wife'

 Now this paradigm has been reanalyzed in Modern Yucatec Maya, to different degrees in different dialects. The first steps are common to all dialects. The starting point of the reanalysis is the second person. The marking is reanalyzed as based on a morpheme *a* after which a *w* glide is inserted before a vowel. This model of *w* insertion is then applied to the first person singular, which is now based on a constant morpheme *in*, after which a *w* glide is inserted if it is followed by a vowel. This is the treatment common to all Mayan dialects of the peninsula.

In the western dialects, in particular, the dialect of Cantamayec (Yucatán)[21], the logic of this reanalysis is extended to the third person: there is a constant morpheme *u* after which a *y* glide is inserted if it is followed by a vowel. The inserted glide is phonologically part of the head noun or verb stem. The resulting paradigm is represented in Table 3, where the prevocalic glide is shown in parentheses.

Table 10.   *Pronominal clitics in western Modern Yucatec Maya*

number person	singular		plural		
1	in (w-) X			k	X
2	a (w-) X		a	(w-)	X-e'x
3	u (y-) X		u	(y-)	X-o'b

We are faced with a complex reinterpretation of a conditioned allomorphy: One set of the erstwhile allomorphs (viz. the original preconsonantal set *in, a, u*) survives in its function, being elevated to morpheme status, while the other set is downgraded to a morphologically conditioned euphonic glide. E23 presents prevocalic examples from the western dialect.

E23. a. in   watan
YM   POSS.1.SG   Ø:wife
            'my wife'

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[21] the dialect represented in Blair 1964 and Blair & Vermont-Salas 1965

b. a   watan
   POSS.2 Ø:wife
   'your wife'

c. u   yatan
   POSS.3.SG   Ø:wife
   'his wife'

Thus the glides that had constituted direct coding are reduced to indirect coding.

In the eastern dialects, this latter step is not taken, and the prevocalic third person marker stays *y-*. In the transition zone between the dialects, the diachronic variation is present in synchrony, since both the inherited and the new third person prevocalic marking occur as variants; 'his wife' may be either *yatan* (as in E22.c) or *u yatan* (E23.c). In the former variant, *y-* is a morpheme, in the latter, it is not even a morph, but just a phonological part of a conditioned stem allomorph.

That is the historical account. If, however, one only had the synchronic data of Table 10 plus the information that the third person form may be reduced to *y*, one might easily be led, by the precedence of the morphologization examples we saw before, to the opposite analysis, viz. that the pronominal clitics condition glide insertion and that this phonological reflex may be morphologized if its erstwhile conditioning factor, the pronominal clitic, is dropped. This shows that the change from indirect to direct coding is not unidirectional. The opposite change, the downgrading of an allomorph to a phonological alternant, does occur, too.[22]

4   Paradigmatically and syntagmatically mediated coding

The phase models Table 1 and Table 8 set up for the development of indirect coding as mediated by the paradigmatic and the syntagmatic axes may be joined as in Table 11:

Table 11.   *Full cycle from direct to indirect to direct coding*

phase		process	paradigmatic mediation	syntagmatic mediation
1		direct coding	Expression unit E_s codes sense S_s **directly** by virtue of language sign LS_s with $signans_s$ and $signatum_s$.	Expression unit E_i codes sense S_i **directly** by virtue of language sign LS_i with $signans_i$ and $signatum_i$.
2		sense transfer / constraint	Secondary expression unit E_s evokes S_i on the basis of a similarity between $signatum_s$ and the semantic domain of S_i.	Secondary expression unit E_s is conditioned by a constraint associated with LS_i.
3	a	reanalysis ↓		$Signans_s$ is reinterpreted as relating to $signatum_i$.

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[22] These Yucatec facts thus come close to a counterexample to the hypothesis in Dressler 1985:311 according to which the semiotic upgrading involved in the morphologization of a phonological alternation corresponds to a tendency towards more efficient grammatical structures and is irreversible, and to the similar hypothesis launched in Wurzel 2004:1603 according to which the phonologization of a morphological alternation is excluded. They only come close because the alternation of Table 10 is not a purely phonological alternation, as it is partly morphologically conditioned.

	b	indirect coding	E_s **indirectly** codes S_i.	
	c		S_i becomes $signatum_i$ of $signans_s$	
	d	distributed/ split coding	As long as $signans_s$ retains $signatum_s$, $signans_s$ is now **polysemous** between $signatum_i$ and $signatum_s$.	As long as $signans_i$ remains an expression feature of $signatum_i$, the coding of $signatum_i$ is now **split** between $signans_i$ and $signans_s$.
4	a	functional shift ↓	The function of coding $signatum_i$ **shifts** definitively to $signans_s$ (on the paradigmatic axis).	
	b	loss of original sense/ conditioner ↓	$Signatum_s$ is lost. E_s appears even after the loss of its original sense.	$Signans_i$ is lost. E_s appears even after the loss of its former conditioner.
	c	direct coding	E_s now codes S_i **directly** by virtue of a language sign with $signans_s$ and $signatum_i$.	

The table brings out the extent to which the two processes are analogous. The remaining differences are irreducible:

- Paradigmatically mediated coding keeps an initial signans constant and acquires a new signatum for it. Syntagmatically mediated coding keeps an initial signatum constant and acquires a new signans for it.
- Syntagmatically mediated coding involves two linguistic signs. Paradigmatically mediated coding may or may not involve more than one linguistic sign.

5 Application to linguistic description

5.1 Interlinear glosses

We have seen diachronic transitions between indirect and direct coding which may be articulated in terms of a number of phases. However, synchronic analysis of these dynamic phenomena presupposes binary decisions. In interlinear morphological glossing, in particular, the text is divided into morphs, with each of them being paired with a gloss specifying its meaning or function. There the issue of whether a certain morph codes or does not code a certain feature cannot be left open. Instead, a binary decision must be made between a property possessed by an item by virtue of its obedience to a constraint – dispensing with a gloss – and a property possessed by an item by virtue of its meaning or function – leading to a gloss. The principle to be proposed will be illustrated with Yucatec transitivity marking as seen in §3.4.1.

In a situation of syntagmatically mediated coding:

a. as long as the conditioning expression Ei is in the context, the semantic component Si in question (TR) is attributed to it, not to the conditioned expression unit Es:

→ YM (western dialect)   in   bul-ah   'I submerged it'

gloss: either SBJ.1.SG submerge-CMPL

             or SBJ.1.SG submerge(TR)-CMPL

        not: SBJ.1.SG submerge-TR.CMPL

b. after the conditioning unit LSi has disappeared, the semantic component Si is attributed to the erstwhile conditioned expression Es:

→ YM (eastern dialect)   in   bul-ah   'I submerged it'

gloss: SBJ.1.SG   submerge-TR.CMPL

5.2 Morphological description

If a feature is coded twice (or more) in a given word form, e.g. both the root and an inflectional affix appear in an alternative form, then the model defended in § 3 for Yucatec (and for Latin declension) assumes that the morphological form codes that feature in one of the places, but is a conditioned allomorph in the other places. It therefore forces a decision on the *locus* of the feature. Matthew Anstair (e-mail 22.01.08) argues that in a verb form of Biblical Hebrew, TAM categories are coded over the entire inflected form, i.e. e.g. PAST is expressed both by a special verb stem and by special conjugation endings.

It might appear that the descriptive problems presented here in terms of indirect coding disappear as soon as one renounces to an analytic approach such as the item-and-arrangement and item-and-process models and takes a holistic approach like the word-and-paradigm model. It has become all but fashionable to generalize the word-and-paradigm approach and declare the morpheme as an out-dated construct of structural linguistics. This fashion is, however, based on a misunderstanding. The holistic and the analytic approach always complement each other both in language and in linguistics; it is counterproductive to set one of them as absolute. In science more than anywhere else, the possibilities of analysis have to be exhausted; and clearly different linguistic structures are amenable to analysis to different degrees. Agglutinative morphology is best described by an item-and-arrangement model. Morphological processes that amount to phonological modifications of a morpheme are best described by an item-and-process model (Hockett 1954). And cumulative morphology, where one minimal sign is the exponent of a set of values of grammatical categories coded on a lexical stem, is best described by a word-and-paradigm model (Matthews 1972). We have here been dealing with phenomena that are amenable to an item-and-arrangement or an item-and-process approach, and to their counterparts at the levels of phonology and syntax. It allows us to see a unitary process of indirect coding at different linguistic levels. The word-and-paradigm model would not only not allow us to see indirect coding at the morphological level; it would also loose the analogy with the other linguistic levels.

6   Conclusion

In linguistic description, it is necessary to be explicit on whether the signatum of a certain meaningful unit does or does not include a certain feature. It would be incorrect to ascribe the unit a feature that it only acquires by paradigmatic or syntagmatic mediation. The primary

purpose of this contribution was to clarify the descriptive problem illustrated in §5.1 and specify the criteria for the two alternative solutions. That is, of course, not to deny that there are borderline cases generated by the transition between direct and indirect coding.

Indirect coding is janiform. On the one hand, direct coding has a straightforward iconic function, while indirect coding introduces a complication. We have seen that it is, in fact, an important source of countericonic constructions. On the other hand, if we consider examples such as agreement, where what is a category of A is coded on B, we can see that indirect coding helps recognizing that the secondary unit is related to the primary unit. It is, thus, a form of marking relations in linguistic constructions of any level. On the syntagmatic dimension, it marks syntactic, morphological and even phonological relations. On the paradigmatic dimension, indirect coding evokes a different semantic domain.

In a diachronic perspective, we have seen that indirect coding may be simplified to become direct coding. The mechanism is a kind of shift: the secondary expression unit acquires a new sense or function from another unit that is related either on the paradigmatic or on the syntagmatic axis. However, as the case of Yucatec pronominal clitics teaches us, this change is not unidirectional; it is also possible for direct coding to be reanalyzed as indirect coding.

The process discussed here, viz. that some object acquires some particular shape under the influence of a conditioning factor and retains that shape even after that factor ceases to exist, is a widespread one in life. In such a constellation, all existent individuals of a kind may possess a certain property which is, nevertheless, not essential for the concept. The highest relevant level to be examined in this regard in linguistics is human language itself. It is quite possible that it acquired certain properties as constraints dictated by the environment in which it evolved, that the environmental factors have long ceased to exist, but that all languages still have the relevant property.

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