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Language as a complex algebra: Post-structuralism and inflectional morphology in Saussure's *Cours*

Abstract: In Item-and-Arrangement models of inflection, morphemes are associations of form and meaning stored in a mental lexicon. Saussure's notion of the linguistic sign as a unit of an acoustic image (signifier) and a concept (signified) immediately suggests such a model. But close examination of the examples of inflectional morphology throughout the Cours brings Saussure's ideas more in line with Process morphology, a model in which recurrent elements in word forms are exponents of content features, and realizational rules license a word form inferentially from the word's content. The Saussurean sign allowed French structuralists to revolutionize the methods of modern social science, eschewing the motives and intentions of human actors to focus on the system of oppositions that make signification possible in each domain. Eventually, post-structuralism rejected the static nature of the linguistic sign, forcing linguistics into relative isolation (since it held on to sign-based models of language). The criticism of structuralist treatments of morphology in Process models of inflection, however, stands as an exception to this tendency. In retrospect, I argue, similar ideas can be found in Saussure's view of the langue as a complex algebra.

Keywords: morpheme, paradigm, sign, structuralism

1 Introduction

Over a century ago, Ferdinand de Saussure's lectures at the University of Geneva ushered in a new era in the discipline of linguistics (Gadet 1989; Joseph 2012). Two of his colleagues, Charles Bally and Albert Sechehaye, published Saussure's notes in 1916 as the *Cours de linguistique générale*. Saussure's ideas were seminal in the development of structuralism, an intellectual movement that dominated the French (and continental) social

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sciences in the postwar period. After the validity of the Saussurean methods in the social sciences was questioned by post-structuralists like Derrida, Foucault, and Barthes (in his late work), however, linguistics lost its privileged position among related disciplines. This reversal of fortunes has been exacerbated by the perception that structural methods are still central to the practice of linguistics. I will argue, however, that changes taking place in *morphology* (the sub-discipline of linguistics that studies word formation) should be understood as a rejection of some fundamental concepts of structuralism in linguistics, in particular with respect to the nature of the linguistic unit (i.e., the Saussurean sign).

Structuralist morphology is associated with a lexical view, put into question by the development of process-based models of word structure (Matthews 1972; Anderson 1992; Stump 2001). This lexical view is taken for granted in the structuralists' interpretation of Saussure. But, as I will show, Saussure's treatment of inflectional morphology in the *Cours* reveals a more fluid view of the sign's internal structure than commonly assumed, approaching at times a process-based conception of the relationship between form and content. This conclusion, I argue, has consequences for the intellectual legacy of Saussure and his true place in the debate between structuralism and post-structuralism, and for the contribution that modern approaches to the study of word structure in linguistics can make to the development of semiotics.

The paper is structured as follows. Section 2 provides an overview of the intellectual developments that lead to the emergence of French structuralism, and then to its demise, evaluating the role played by Saussure's conception of the sign (and also its fate). The section closes with a consideration of post-structuralism in linguistics, suggesting that in spite of some interesting developments in discourse analysis, the post-structural revolution in this discipline took a different direction, by questioning the monolithic association of content and form that was so fundamental in structuralist morphology. To understand it, it is necessary first to review the development of morphological theory since the second decade of the twentieth century. This is the content of Section 3. In Section 4, I inspect the treatment of concrete examples of inflection throughout the pages of the *Cours*. The conclusion of this section is that Saussure's conception of the sign was not as self-contained as many structuralists (in linguistics and other disciplines) have suggested. Section 5 concludes the article, pointing out that much of the criticism of the Saussurean legacy in the social sciences does not apply to Saussure's lessons, but rather to the way in which they were interpreted later on in a much different intellectual environment.

2 The Saussurean sign and the development of the social sciences

2.1 Saussure's sign and the structuralists

Among the notions in the *Cours* that have had a lasting influence is the definition of the linguistic sign as a unit of content (the signified, a concept) and form (the signifier, an acoustic image). Saussure rejected the idea of linguistic signs as labels for extra-linguistic objects, emphasizing the interdependent nature of signifier and signified: the one cannot exist outside its association with the other. The *Cours* illustrates this principle with a powerful metaphor. The *langue* is like a sheet of paper, in which the undifferentiated mass of content is one side, and the undifferentiated mass of expression is the other. One side of this sheet cannot be cut without cutting the other side as well (Saussure 1995 [1916]: 157). Taken independently, neither the plane of ideas nor the plane of the phonic matter belong to linguistics. What language does is to impose associations between the two planes, so that thought and expression can relate to each other.

According to F. Gadet, "the sign is the anchoring-point of non-linguists' interest in Saussurian [sic] theory and structuralism" [Gadet 1989:134]. The discovery of the internal structure of the sign allowed the social sciences to develop a method concerned with the system of oppositions that make signification possible in each domain. Based on the ideas contained in the *Cours*, a young generation of scholars in postwar France proposed an "explanatory" model to replace the "interpretive" model of the previous generations (Humanists, Marxists, and Sartrean Existentialists), which was more focused on the motives and intentions of human actors (Pavel 2001).

Even though Saussure's ideas about linguistics were fundamental in the development of French structuralism, his influence did not come through French linguistics. In France, the *Cours* was not received with much enthusiasm, as is evident in Meillet's negative reaction to its publication (Harris 2001). In spite of occasional inroads in the French academic landscape (Arrivé 2003), linguists did not show interest in Saussure's ideas, remaining attached to the practice of historical linguistics. A. J. Greimas famously laments this state of affairs, when he states: "La théorie saussurienne reste presque ignorée de la 'philologie française' fidèlement attachée, du moins dans ses principales contributions, à l' esprit de la grammaire historique du XIXe siècle" (Greimas 2000 [1956]: 371).

Saussure's ideas were better received outside of France, as in the Prague and Copenhagen schools. It was through their influence on young proponents of

the new science of semiotics that Saussure came to have an impact on the development of structuralism (Gadet 1989; Arrivé 2003). A pivotal figure in this intellectual development was Roman Jakobson. During the war, Jakobson taught at the École Libre des Hautes Études in New York (Chaubet and Loyer 2000). Claude Lévi-Strauss attended Jakobson's lectures on the phoneme in 1942, making a radical shift towards structuralism in anthropology. His analysis of kinship systems was thus directly inspired by the Saussurean turn that the Prague Circle imparted to phonology.

The other key player in the transmission of the principles of Saussurean linguistics to the French structuralists was Louis Hjelmslev, by way of Algirdas J. Greimas and Roland Barthes. Four decades after the publication of the *Cours*, Greimas and Barthes started to write about the importance of Saussurean ideas for other human sciences (Greimas 2000 [1956]; Barthes 1957). The young scholars were captivated by Saussure's insistence on defining a concrete object of study outside of the heteroclite, observable facts in the social sciences as a way to induce scientific rigor in their disciplines. Strozier has a similar evaluation of Saussures influence:

> The conception of *langue* – or code or structure – as opposed to *parole* or individual utterance has been one of the most powerful oppositions in twentieth-century theory, allowing later theorists in a variety of fields to discover in widely divergent texts or heterogeneous data a set of underlying structures or codes. (Strozier 1988: 1)

But, according to Arrivé (2003), the Saussure that affected structuralism was Hjelmslev's Saussure. Barthes, for instance, had knowledge of Helmslev's work before he had direct contact with the *Cours*, and so did Greimas (Arrivé 2003).[1] Hjelmslev and his circle took Saussure's conception of the *langue* as form and not substance to their logical consequences (Harris 1999). If Hjelmslev's effect on contemporary linguistics was modest, his importance for the other social sciences was amplified by his contribution to the broader science of semiology

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[1] In a preface to *Mythologies* written in 1970, Barthes acknowledges that he had read Saussure just before writing the book. But the book, published in 1957, was a compilation of short essays written between 1954 and 1956, with a post-face, *Le mythe, aujourd'hui*, written in 1956. References to Saussure's semiology can only be found in the post-face, as Arrivé (2003) notices, while the theory that frames the short essays "is founded on the Hjelmslevian layered conception of a connotative semiotic in terms of content-expression" (Taverniers 2008: 373). It is likely then that Barthes had read the *Cours* in 1956, while he was compiling the short essays for publication, preparing the text of the post-face to be included in the final volume. This is consistent with statements that Barthes had made elsewhere (Arrivé 2003).

(Gadet 1989).[2] Hjelmslev elaborated Saussure's notions of *signifier* and *signified* as *content* and *expression*, extending to the analysis of content the method of contrastive analysis employed by the Prague Circle in the analysis of expression. In language, the two are two interdependent planes, related by *denotation*. But the signs of language can be expressions of other social meanings, giving rise to *connotation*. This is the fundamental concept that allowed Greimas and Barthes to develop a structuralist methodology for the analysis of systems of signification that use an already structured system of signs as signifiers. Thus, in Barthes' *Mythologies*, a photograph of an African soldier in a French uniform connotes the imperial determination of the French Fourth Republic. This secondary plane of content constitutes an ideology or a mythology (Taverniers 2008).

2.2. From consciousness to textuality

As the social sciences started to fall under the "linguistic spell," however, a fundamental aspect of Saussure's perspective on language was left aside. According to Strozier (1988), Saussure belonged to an intellectual tradition that, from Descartes to Husserl, was centered on the study of consciousness. This was an era marked by phenomenology and the study of "the structure of the subjective consciousness and the immanent object" (Strozier 1988: 3). Saussure's *langue*, then, is a phenomenon of consciousness, not an exteriority (i.e., a system to be found in a body of text). More importantly, *parole* is also an interiority (the individual linguistic act), not the external manifestation of the *langue*. Saussure focuses on the "psychological" portion of the speaking circuit, excluding anything exterior to the mind as part of the language faculty (that is, the referent and the physical/physiological aspects of sound and phonation). Saussure does a phenomenological reduction, Strozier (1988) says, moving away from the view of the sign as a name assigned to (or pointing to) a thing. The referent and the acoustic/articulatory aspects of language are bracketed out, focusing on the internal (i.e., phenomenological) aspects of signification. It's

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2 There is a close historical affiliation between the Prague and Copenhagen circles. Before immigrating to the United States, Jakobson flew to Copenhagen from Prague to escape the Nazis, coming into contact with Hjelmslev and his collaborators (Gadet 1989). Nevertheless, there remained important differences between the two schools. Hjelmslev (1972 [1947]) criticizes the Prague Circle for trying to find form within substance. For instance, while the Praguian phoneme is a phonetic abstraction, Hjelmslev sees it as a pure relational unit in the system, more in line with Saussure's conception.

there where value (and the system of negative oppositions) can occur, since in the "exterior" world there is not form but only substance.[3]

With the third decade of the twentieth century, however, consciousness was rendered inaccessible. There was a methodological shift from the internal to the external.

> For theorists after the shift consciousness becomes at first a dark and secluded realm to which they seek a mediated access ... Once the text has been established in priority as the expression of consciousness ... theorists turn to the analysis of text, not consciousness. The structural and post-structural methodological shifts dispense with the individual subject – and by implication with the individual consciousness. (Strozier 1988:11)

The structuralist reinterpretation of Saussure saw *parole* as the external data from which a model of the *langue* can be constructed. What was preserved is Saussure's method of analysis (the structural method), which came to constitute the foundation of an intellectual tradition anchored in the external manifestations of consciousness: the text. The conception of *parole* as external manifestation of *langue* stood as an Americanization of Saussure, bringing his ideas closer to those of Distributionalism.[4] This positivistic transatlantic influence was capped by the various attempts (most noticeably by Benveniste) to recast the Saussurean sign as a name assigned to a referent.[5]

One of the motives that drove other social sciences away from the linguistic model is the static connection between form and meaning in the Saussurean concept of the sign. For Jacques Derrida, and for the Barthes of *S/Z* or *Le plaisir du Texte*, for instance, the lack of distance between signifier and signified was a shortcoming of structuralist ideas (Pavel 2001). Derrida removed the meaning from the sign. If both signifier and signified are external, the signifier "defers" the encounter with the signified, but this is an infinite distance. The play of signifiers, Derrida showed, does not have a signified as the endpoint. At the same time, Derrida rejected Saussure's logocentrism, insisting that there is no signification

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3 Not all scholars in the phenomenology school, however, endorse the bracketing out of the referent in the study of signification. According to Choi (2008), Paul Ricoeur rejected the identification of meaning with language-internal form, returning to the traditional theory of symbol as representation.

4 The identification of *parole* with the notion of "performance" in Generative Grammar is another instance of the shift towards exteriority in modern linguistics. But it is worth noticing that even *langue* is interpreted as a manifestation of language which is external to the speaker by Generativists. This is one way in which "competence" is meant to differ from the Saussurean construct (Newmeyer 2013).

5 According to Lagopoulos (2010), a similar slide from idealism to positivism can be observed in Lévi-Strauss's interpretation of Saussure.

prior to language in the consciousness of the speaking subject (Daylight 2012).[6] Likewise, Barthes regarded the text (and its readings) as external to the originator of the text. In *S/Z*, Barthés used the Saussurean method to divide the text into units or "lexias." The codes behind the text are partially paradigmatic and partially syntagmatic, but the author is left out of the analysis.

The post-structuralism of Derrida, Barthes, Lacan, and Foucault did not constitute a radical departure from structuralism, however, but an update of some of its principles into a semiotic theory that reflected the failure of modernity as a cultural project (Lagopoulos 2010; Posner 2011). In fact, the early works of many post-structuralists were clear exponents of the structuralist methodology. Thus, post-structuralism can be seen as an intensification of the movement towards exteriority, and a more radical rejection of the study of consciousness than the structuralists ever did (Strozier 1988).

2.2 Is there a post-structural linguistics?

In linguistics, though, it is as if post-structuralism never arrived. In the words of J. Joseph, "the field in which structuralism was first developed clings on to it long after its abandonment from those which borrowed it later" (Joseph 1992: 177). Some comparisons of mainstream linguistic analyses with more "critical" approaches can be found in the recent literature (Wetherell 1998; Rampton 2007), but are often confined to sociolinguistics, discourse analysis, or language pedagogy.[7]

Wetherell (1998) makes the contrast between structuralism and post-structuralism particularly clear for linguists. She analyzes a conversation about the sexual lives of a group of British teenagers, in which an act of sexual prowess by one of them ("four in a night") is narrated and discussed by the others. In traditional sociology (or social psychology), a satisfactory analysis of the conversational patterns would motivate them in external social causes (or internal psychological motivations). What in America is often referred to as "locker-room talk" can be interpreted as an expression of attitudes towards women, internalized gender ideologies, or sexual experimentation typical of a developmental stage. Those attitudes, ideas, and events are extracted from the conversation. But in modern social psychology, such a "referential" approach is replaced by two traditions of discourse analysis: the ethnomethodology/conversation

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6 Daylight argues that such criticism is directed more properly at Husserl than at Saussure, however. Even though it is true that Saussure gave spoken language priority over writing, Daylight says, this is no indication of a belief on the part of Saussure of a pre-linguistic "mental essence" (2012: 248).

7 See Joseph (1992) for a review of other linguistic research in the post-structuralist framework.

analysis model, on the one hand, and Foucauldian/poststructuralist discourse analysis, on the other.

Against the traditional "interpretive" models, structuralist approaches present "explanatory" models that disregard all external social or natural causes (Pavel 2001). Thus, as Wetherell shows, ethnomethodologists and conversational analysts are interested in the action orientation of talk, seeing the conversation itself as the place where social orders (which are eminently symbolic) are intersubjectively built by the participants. What matters in the analysis is what the conversation means to the participants (the concept of "participant orientation"). Conversation analysis examines the use of general procedures (such as turn-taking or answering a question) by the participants. When they use these procedures, the participants display to each other their knowledge about context, settings, and each other's roles, and in so doing build up a social order. For instance, when asked to narrate an act of sexual prowess ("four in one night"), one participant in Wetherell's study refuses to do so. Such conversational non-compliance needs to be justified, and he does it adducing a state of inebriation at the time of the events. This makes it possible for another participant to assume the role of narrator, consistent with the attitude that dictates that stories of prowess should be left to others to tell.

The "talk-in-interaction" analysis just sketched has a clear structuralist flavor: rejection of "referential" meaning, focus on the textual, external manifestation of the symbolic (as opposed to reasons internal to the subject's consciousness), analysis by identification of units (utterances) and their place in a system, etc. But for a Critical Discourse perspective, however, the notion of participant orientation is too narrow, too centered on a monolithic notion of subjectivity. Human beings are incessantly involved in meaning-making activities, using everything around them (words, objects, actions) as signifiers, as long as they can express a difference. Even the subject is a term in this play of oppositions. Subjectivities, then, are always redefined (negotiated, constructed) in the conversational exchange, and cannot be assumed to be the locus of signification. To make things more concrete, let's reconsider the conversation around the 'four in a row' story. As Wetherell shows, the teenagers in the conversation construct sexual prowess as something impressive (to be praised and admired for), as promiscuity (which prompts shame and condemnation), as the result of uninhibited behavior (hence the inebriation excuse), or as sheer luck. Such shifting of perspectives is in itself an association chains of the possible subjectivities that boys may assume around sex, and in a Critical Discourse approach to social psychology that in itself becomes the object of study.

Thus, Critical Discourse Theory represents one strand in the rejection of structuralist methods in linguistics, in which some of the postulates of post-

structuralism are clearly recognizable. I will suggest, however, that the post-structuralist rebellion in the social sciences did not march against the Saussurean sign, but against the positivistic version of the sign that American Distributionalism and the French structuralists proposed in its place. In the discipline of linguistics, aside from the development of Critical Discourse Theory, the rejection of the structuralist paradigm took another form: a return to a pre-structuralist conception of the relationship between signifier and signified, in which the unity of the sign is broken up, replaced by the notion of correspondences between features of content and features of expression. In so doing, proponents of the new models felt it necessary to either reject or redefine Saussure's model of the sign. But, as I will show in Section 4, the Saussurean view of inflectional morphology already contained in it the idea of correspondences, having understood in advance the dangers and pitfalls of a model of the sign based on positivistic principles.

3 Signs and morphemes

3.1 Saussure and the problem of the unit of analysis

One of the principles that characterize the Saussurean sign is the linearity of the signifier. The elements that make up the acoustic image present themselves one after the other, in a temporal sequence. Therefore, when signs are combined to form complex messages, they will do so in a linear fashion as well. Taken by itself, however, the chain of sounds that make up the signifiers appear as *un ruban continu* (Saussure 1995 [1916]: 145), a continuous band, without any perceptible boundaries. The only way to segment the stream of sound is by association with the signified. The *Cours* then presents a method for finding the units of a linguistic system on the basis of this observation: to each division of the acoustic chain corresponds a division in the chain of concepts (Saussure 1995 [1916]: 146). To verify that a unit has been correctly identified, it is necessary to place the isolated chain of sounds in a different context, with the expectation that it will keep its meaning.

This method seems simple when the units in question are words. But Saussure is quick to point out that there are units of form and meaning smaller than the word. The French words *cheval* 'horse.SG' and *chevaux* 'horse.PL' are different words, but they share a feature of meaning and corresponding sound sequences (Saussure 1995 [1916]: 147–148). Therefore, a sign may be smaller

than a word; it may correspond to roots, stems, prefixes, or suffixes. Morphemes, in sum, are identified as the smallest units of meaning and sound that constitute the linguistic system.

At first glance, then, the *Cours* seems to offer a theory of the morpheme similar to that of Item-and-Arrangement models (Hockett 1954). In fact, contemporary scholars who are critical of such an approach tend to identify it with the Saussurean tradition. Arguing against an analysis of the English suffix /z/ in which it contributes its own {PLURAL} feature to the numberless noun it combines with, Spencer (2001) observes that "in this respect, the plural suffix is a Saussurean sign, a pre-compiled pairing of form and meaning" (Spencer 2001: 280). On the other hand, Aronoff (1976) denies that there are meaningful units below the word level, and therefore feels compelled to redefine Saussure's definition of the sign: "The minimal meaningful unit of a language is the basic, minimal Saussurean sign, ... [but] ... for the purposes of syntax, the word (sans inflection) is the minimal sign" (Aronoff 1976: 9). A careful reading of the *Cours*, however, shows that Saussure held a more complex view of the relationship between form and meaning than commonly assumed. Before going through the evidence in the text of the *Cours*, I will briefly introduce the main theoretical currents in the analysis of inflection.

3.2 The Item-and-Arrangement model of morphology

A definition of the morpheme as the "minimal unit of sound and meaning" is characteristic of Distributionalism, a method of analysis that dominated American structuralism. Distributionalism traces its roots to the work of Leonard Bloomfield and his disciples. The following quote from Bloch (1947) typifies their ideas:

> To describe the structure of a language as a whole, the linguist must be able to describe also the structure of any single sentence or part of a sentence that occurs in the language. He does this in terms of constructions – essentially, in terms of MORPHEMES and their ORDER. Any sentence, phrase, or complex word can be described as consisting of such-and-such morphemes in such-and-such an order; each morpheme has a meaning, and so also has the order in which they occur (the "constructional meaning"). (Bloch 1947: 399–400)

The distributionalist method is based on the *agglutinative* principle, and the principle of *compositionality*. The Agglutinative principle establishes a one-to-one correspondence between units of meaning and units of expression. These simple and discrete elements are the morphemes of the language, and they can be listed or "itemized." The principle of compositionality establishes that the meanings of complex expressions, formed by linear arrangements of the

elementary items, are a function of the meaning of the parts. This method of morphological analysis results in the Item-and-Arrangement (IA) theory of inflection.

Bloch's (1947) analysis of the English verbal system is a good example of the IA theory. A preterit verb form like *waited* is divided into two morphemes: /wait/ and /ed/. Each has a meaning (/wait/ is a particular action, /ed/ indicates past tense), and the combination gives the compositional meaning "perform the action of waiting at a point before the present." The challenges for the model are posed by preterite forms like *took*, which are both semantically related but morphologically distinct from a present form like *take*. Bloch's solution is to analyze *took* as a complex word: /tʊk/ + /Æ/, where /Æ/ is a "zero" variant of the past tense morpheme, and /tʊk/ is a variant of /teʲk/ that occurs before the past tense morpheme. The vowel change that distinguishes /teʲk/ from /tʊk/ is a matter of morphophonemics, defined as "the study of the alternation between corresponding phonemes in alternating shapes of the same morpheme" (Bloch 1947: 414).

In this way, Bloch's analysis can list /tʊk/ as an alternative form of *take*, conditioned by its distribution and related to /teʲk/ by a morphophonological rule. The alternative, which Bloch is trying to avoid, is to analyze /tʊk/ as the result of a *process* of vowel change affecting the morpheme /teʲk/ to express the preterit. Process morphology predates distributionalism, and is often associated with the school of Native American linguistic studies that developed around Franz Boas, Edward Sapir, and their students. Hockett (1954) defends the merits of the IA model against the Item and Process model. His objections are twofold. He is weary of a historicist bias in the analysis of word formation, since the term "process" is often associated with linguistic changes over time (like Saussure, Hockett is against analyzing a synchronic phenomenon in terms of its diachronic causes). In addition, Hockett is suspicious of models that do not lend themselves easily to formalization, since they are not useful to develop the explicit kind of analyses that modern linguistics requires. The IA model achieves that goal by providing an exhaustive listing of all the morphemes in a language (and their morphophonological variants), alongside their possible combinations.

3.3 Process-based models of morphology

In the last forty years, however, IA morphology has come under intense scrutiny, and a return to the models that predate it has become the norm (Matthews 1972, 1974; Anderson 1992; Aronoff 1976; Stump 2001). The reasons

for the rejection of the IA model can be found in the existence of deviations from the agglutinative principle. In the IA model, these mismatches are handled by morphophonemic rules. But, as Matthews (1972) notices (and Hockett 1954 anticipates, to his credit), not all deviations from agglutination can be reduced to cases of allomorphy. Here is where the notion of process regains its currency.

To return to the case of the zero morph, it is the agglutinative principle that leads Bloch to postulate it to express the preterite in cases such as *took*, in which the opposition between simple present and past participle is not overtly marked by a suffix. Zero morphs are also invoked to explain stem change cases, like the contrast between *man* and its plural *men*. In this case, a zero alternative of the plural /s/ occurs as the suffix. Like /tʊk/, /mɛn/ is a grammatically conditioned allomorph (i.e., a variant of /mæn/, resulting from a morphophonological rule) that appears before a zero suffix expressing plural. There is an alternative, however, that does not require zero morphs, or morphophonological rules to account for stem changes. A process changes /eʲ/ into /ʊ/ in *took* to give the preterite of *take*. Likewise, /æ/ changes to /ɛ/ in *men* to give the plural of *man*. Hockett (1954), who sees the advantages of such analyses, tries to get around the informal nature of the model by incorporating some of the insights of the IA model. He does so by dissociating morphological processes from their material realization. A process is a change (or specification) of a morphosyntactic property (i.e., the past tense form of a verb, or the plural of a noun). Processes are expressed by *markers*, defined as "the difference between the phonemic shape of a derived form and the phonemic shape(s) of the underlying form or forms" (Hockett 1954: 396). Thus, in this formalized version of the IP model, /tʊk/ is underlying /teʲk/ with a process of past tense formation, which has the replacement of /eʲ/ by /ʊ/ as its marker.

In this version of Process Morphology, then, morphemes are not units of matter and meaning, but pieces of structure in correspondence with features of content (i.e., morphosyntactic features). Current work in Process Morphology uses the term *exponent* to designate the recognizable pieces that make up the form of a word.[8] Exponence is the relation between a morphosyntactic property and a formative. In the simplest case, there is a one-to-one correspondence between

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8 Hockett's use of the term "process" is somewhat idiosyncratic. For Sapir, a process refers to the morphophonological re-shaping of a root by reduplication, ablaut, affixation, etc. This is more similar to the usage of the term "process" in Process Morphology. Matthews (1974) identifies affixation, reduplication, modification (of which suppletion is an extreme case) as inflectional processes. Notice also that the term exponent is analogous in meaning to what Hockett (1954) calls a *marker*.

an exponent and a morphosyntactic property. This is what happens in the case of *waited*, the preterite of *wait* formed by suffixation of the exponent -*ed*.

But what makes the IP model different from the IA model is that the IP model allows for many-to-many correspondences between the planes of content and expression. Thus, in the case of *took*, the morpheme /tʊk/ is an exponent for the lexeme {TAKE} and the property {PLURAL} at the same time, in what constitutes a case of *cumulative* exponence. Conversely, two or more exponents can be related to a single morphosyntactic property in cases of *extended* exponence. In this way, the need to postulate zero morphs (as in Bloch's analysis) is fully avoided. In fact, the idea of a morpheme as a unit of form and meaning is dispensed with entirely in process morphology.

3.4 Paradigmatic relations and inflectional morphology

A morphological theory has two elements (or dimensions): a sub-theory of word formation, and a sub-theory of denotation (understood as the relationship between form and content). In Item-and-Arrangement theories, word formation proceeds *incrementally*, since every time a morpheme combines with a stem, both form and content features (i.e., morphs and grammatical properties) are added to the representation of a word. Moreover, each morpheme's *lexical* entry specifies a correspondence (i.e., a denotation relationship) between form and content. In Process Morphology on the other hand, a grammatical property of a stem gets specified independently of the marker (or exponent) that expresses it. The denotation relationship is established outside the lexicon, by means of a *realizational* rule. In terms of word formation, process morphology can be incremental too, if each time a grammatical property is specified, then a marker has to be added to the morphophonological representation of the word. This is what Hockett's IP model proposes. In non-incremental theories of morphology, on the other hand, the grammatical (or morphophonological) properties of a word are specified *globally*, all at once, before they are given expression (or interpreted for content).[9] This approach is typically found in *paradigm*-based theories of inflection, such as

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9 Stump (2001) uses the terms "inferential" where I use "realizational," and "realizational" where I use "global" (i.e., non-incremental). My choice of terms attempts to communicate a more clear distinction between the two components of a theory of morphology: denotation and word formation. Moreover, Stump's own global-realizational theory of inflection seems to give primacy to content over form, resulting in a view of word formation that is unidirectional.

the Word-and-Paradigm (WP) models that were favored in pedagogical grammars of Greek and Latin (Robins 1959).

A paradigm is the set of distinct inflected forms of a lexeme. The WP model takes the word as its starting point. Words are organized into paradigms based on their morphosyntactic properties. Morphological rules give instructions to form typical words in each cell of the paradigm, and these rules may make reference to individualized morphs, but the rules do not state a correspondence between isolated morphs and isolated morphosyntactic properties, the correspondence is stated (or learned) globally. IP models, on the other hand, take the stem as their starting point, and define a paradigm as the result of the joint effect of processes triggered by the morphosyntactic properties associated with inflected words. In other words, in IA models of inflectional morphology, inflectional paradigms are epiphenomenal. But since these forms are the result of the combination of a stem with the different inflectional affixes associated with a category, the list of affixes is more primitive than the set of inflected words.

To illustrate, take a Spanish adjective like *rojos* 'red-MASC-PL,' for instance. Incremental models would recognize the suffixes -*o* and -*s*, and would associate them with the properties {MASCULINE} and {PLURAL} (as self-contained signs, in the case of the IA model, or as exponents of those properties, in the case of the IP model). For the WP model, these are part of the instructions to form the masculine plural of the adjective "red": one recognizes the M.PL form of an adjective because it ends in -*o-s*. In a WP model of inflection, then, there are rules for word formation, but formatives are there to distinguish one word from another inside a paradigm, not to express separate morphosyntactic properties. Because of this, there is no need for morphophonemic rules in the WP model.

In lexical-incremental theories of morphology, then, the goal of linguistic analysis is to come up with a list of morphemes and their combinations. The morpheme is defined as a unit of sound and meaning, in a way that seems to approach a presupposed Saussurean ideal of a linguistic sign. Realizational-global models, on the other hand, seem to move away from such an ideal, allowing for many-to-many associations between form and content. But how truly committed to a lexical-incremental view of morphology was Saussure? Lexical-incremental models like the IA model embraced by Distributionalism were developed in the first half of the twentieth century by careful analysis of some complicated facts. At the time when Saussure was giving the lectures that resulted in the *Cours*, however, realizational-global models like the WP model were prevalent. With more than a century of linguistic research between then and now, it is gratifying to see that Saussure had anticipated some of the pitfalls of the IA model.

4 Inflectional morphology in the *Cours*

4.1 Inflectional morphology and associative relations

To frame Saussure's discussion of inflectional morphology, it is useful to take into account his two fundamental kinds of relations between signs: the associative (or paradigmatic) and the syntagmatic.[10] Starting with the associative axis, it becomes quickly apparent that, as in WP models of inflection, the paradigm is not epiphenomenal in the Cours, but a substantive theoretical construct. In a telling passage, Saussure discusses zero morphs in Czech. He notices that the form žen 'woman.GENITIVE.PL' is distinguished from žen-a 'woman-NOMINATIVE.SG.' only by the absence of a suffix. The Agglutinative Principle would require a zero morph for the genitive plural, but that is not what Saussure suggests. He uses this example to argue that oppositions and differences are also operative at the level of expression (the *partie matérielle* of linguistic value). The absence of a suffix creates a perceptual difference that can be used to express a conceptual contrast, without postulating a null morpheme. "Le genitif pluriel tchèque žen n'est caracterise par aucune signe positif ... žena ne vaut que parce qu'il est different" (Saussure 1995 [1916]: 163). At the level of the signifier too, then, difference displaces substance.

This passage shows that the WP model was clearly the background to Saussure's analysis of inflectional morphology. Like the critics of the IA model decades later, he rejects the postulation of abstract signs just to give expression to pieces of content. Two paradigmatically associated words are distinct signs because there is a difference in their material representations, regardless of the fact that one pole of the difference is marked by absence.

In a following passage, Saussure remarks on the similar formation of two different words in Greek as a further illustration of the "systematic play of differences" at the material level of the language (Saussure 1995 [1916]: 163–164). The verbs éphēn 'I was saying' and éstēn 'I stood (something) up' are formed identically, with a prefix é- and a suffix -n surrounding the stem. But while the first one is an imperfect, the second one is an aorist. The formative é- ... -n is one "morpheme" with different meanings, depending on the root it combines with (a case of syncretism across paradigms). The morpheme itself has no meaning, but rather it has a place in a system of oppositions. Its value is determined by the

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10 The term "paradigmatic," often associated with Saussure, was in fact introduced by Hjelmslev to replace the term "associative," which is how the Cours refers to relations among signs *in absentia*. (Gadet 1989).

opposition *éphēn-phēmi*, while there is no equivalent opposition *éstēn-*stēmi* (the indicative is *í-stē-mi* 'make stand,' and the imperfect *í-stē-n*). The morpheme itself is not a sign, but a syntagmatic expression of a paradigmatic opposition among words. The "imperfect" property of *éphēn* is not expressed in the é ... *n* formative. The only function of the morpheme is to mark an opposition between *éphēn* and *phēmi*, which corresponds to the conceptual opposition between the present and the imperfect. In this passage, Saussure remarks that "Ces signes agissent donc, non par leur valeur intrinsèque, mais par leur position relative" (Saussure 1995 [1916]: 164). They are not two distinct items that are identical in form (as in the IA model), but materially identical elements that enter into distinct paradigmatic oppositions.

4.2 Inflectional morphology and syntagmatic relations

But certainly there are cases where a word can be decomposed into constituent parts, and Saussure was well aware of that. Such cases (and their exceptions) figure prominently in discussions about syntagmatic associations in the *Cours*. In this regard, Saussure addresses three points: a) the determination of the unit of analysis, b) the question of "partial motivation" in the relationship between signifier and signified, and c) the place of morphology with respect to syntax and the lexicon. I will address them in turn.

Consider first the contrast between German *Nacht* 'night.SG' and *Nächte* 'night.PL', which Saussure brings up in the *Cours* (Saussure 1995 [1916]: 168). He notices that these forms represent a departure from the agglutinative principle, since the plural feature is expressed both in the suffix *-e* and in the stem's vowel change. In Matthews' (1972, 1974) terms, this is a case of extended exponence. Moreover, the stem *Nächt-* expresses the lexeme and the feature plural at the same time, in a case of cumulative exponence. Years later, both Matthews and Hockett would look at many-to-many associations between form and content like the ones Saussure discusses as unsurmountable obstacles to an IA model of inflectional morphology.

In Matthews' exposition of Process Morphology, extended, cumulative, and simple exponence manifest themselves through three different types of process: affixation, reduplication, and modification. The kind of process seen in ablaut of the sort *Nacht-/Nächt-* are modifications, while the addition of the ending *-e* is a case of affixation. But such detailed identification of formatives (or exponents) is not characteristic of the WP model. In it, words are the units of analysis, and the different inflections that make up a paradigm are learned as "facts of grammar."

Here Saussure starts to distance himself from the WP model, when he asks himself the following question:

> Posant une opposition telle que *Nacht* : *Nächte*, on se demanderait quelles sont les unités mises en jeu dans cette opposition. Sont-ce ces deux mots seulement ou toute la série des mots similaires? ou bien *a* et *ä*? ou tous les singuliers et tous les pluriels? etc. (Saussure 1995 [1916]: 168)

In this quote, Saussure gives us all the possible theoretical alternatives, entertaining analyses based on the word, the paradigm, the morphosyntactic property ("tous les pluriels"), and even the morpheme: taking the opposition between *a* and *ä* as an alternative imparts the vowel in the root with the status of a formative.[11] Saussure starts to entertain a model in which the units of analysis are smaller than the word, and where syntagmatic arrangements of such units replace the "facts of grammar" of WP models in a more rational approach to morphology which foreshadows the IA and the IP models.

But what are the units of analysis? As I said before, Saussure observes that signs are not necessarily words, saying that "Il faut chercher l'unité concrète ailleurs que dans le mot" (Saussure 1995 [1916]: 148). He recognizes the existence of complex words. This become apparent in the discussion of simple cases of exponence, as in the regular English plurals *ships, flags, birds, books*, formed by suffixation of -*s*. In these cases, Saussure says, the meaning of the word (as a syntagmatic arrangement of basic signs) is a function of the meaning of its parts. While the arbitrariness between signifier and signified is absolute in the case of each constitutive morpheme, it is only relative when the whole complex word is considered, since the relationship between form and content is motivated (Saussure 1995 [1916]: 181).[12] When the meaning of a whole can be compositionally derived from the meaning of its parts, then the relationship between signifier and signified becomes a matter of grammar.

Traditionally, grammar means morphology and syntax, excluding the lexicon. Syntax is different from morphology, though: the former deals with the function of words, the latter with their form. Nevertheless, Saussure remarks, the

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11 In the same way, Hockett (1954) analyzes the take/took alternation as the result of a morpheme /t_k/ that combines with the infixes /e^j/ in the present and /ʊ/ in the preterite.
12 In his notes, Saussure makes a distinction between relative arbitrariness and 'radical' arbitrariness. By excluding any reference to an extralinguistic reality from the constitution of the sign, Saussure cannot define arbitrariness as convention (because signifier and signified delimit each other). Rather, he defines arbitrariness as "unmotivated" (Gadet 1989). In the case of complex words, a certain degree of motivation is reintroduced, since the word has to contain in its meaning the meaning of its root.

two are interdependent, since a paradigm is constituted by words of identical function. Here again he rejects the traditional divisions of labor that were familiar from preexisting WP models:

> La syntaxe ... a pour objet les fonctions attachées aux unités linguistiques tandis que la morphologie n'envisage que leur forme ... Mais cette distinction est illusoire ... Linguistiquement la morphologie n'a pas d'object réel et autonome; elle ne peut constituer une discipline distincte de la syntaxe. (Saussure 1995 [1916]: 186)

Saussure seems constrained by the WP model, but he also foresees the traps that the IA model sets up. Where the transparency and productivity of word structure dissipates, as in the irregular plurals *men* and *sheep*, then arbitrariness is absolute, and we have whole signs again. For Saussure, this means that the separation between lexicon and grammar is also illusory. What is realized by a combination of units in one case, can be expressed by a lexical unit in another case. He illustrates this point with instances of suppletion (Saussure 1995 [1916]: §266). In Latin, the medio-passive form of *faciō* 'do, make' is not *faciōr*, but *fiō* 'become.' Likewise, in Russian, the verb "say" has two unrelated stems for perfect and imperfect, as seen in *skazát'* versus *govorít'* 'say.PERF/IMPERF.' The existence of suppletive forms in a paradigm is another fact that IA models of morphology cannot fully account for. Matthews (1974) classifies suppletion alongside other processes of modification, like ablaut, but suppletion is total modification. An IA model would have to stipulate the choice of a suppletive form, since there is no recourse to a morphosyntactic rule in such cases.

4.3 A complex algebra

Saussure owes much of his knowledge of linguistics to a tradition dominated by the WP model. His methodological discovery that linguistic facts should be understood as elements in a totality (the system), however, forces him to reject a view of inflection as mere "facts of grammar." Saussure discovers that in addition to associative (i.e. paradigmatic) relations, the mechanism of the langue requires syntagmatic relations. Nevertheless, his keen sense of analysis prevents him from stating that the minimal signs of language are morphemes, and that morphemes are items to be linearly arranged. Signs are positive associations between heterogeneous terms (sound and meaning) defined negatively, by opposition. What matters more to Saussure is the "interplay of differences" that constitute the whole system of the langue, out of which signification emerges. But the Saussurean sign that I find in the *Cours* is a

lot more fluid than later structuralism would have us believe, as can be discerned from the following words:

> La langue est pour ainsi dire une algèbre qui n'aurait que des termes complexes. Parmi les oppositions q'elle comprend, il y en a qui sont plus significatives que d'autres. (Saussure 1995[1916]: 168)

I have argued that, contrary to general opinion, the model of inflectional morphology in the *Cours* is closer to that of realizational-global models of morphology: the WP and IP models. In Saussure's view, there is a gap between signifier and signified, a distance that results in imperfect correspondences between the two planes. The "complex algebra" Saussure contemplates is what latter proponents of the WP and IP models of inflection would develop in their formalized systems.

When scholars like Aronoff and Spencer redefine or reject the Saussurean sign, then, they are actually targeting the structuralist characterization of the sign, not Saussure's. At some point in the history of structuralism the observations Saussure made regarding the complexity of the correspondences between signifier and signified were lost. It is difficult to pinpoint when or where that happened. The circles of Prague and Copenhagen seem to have steered clear of the positivistic approach to inflection that characterized Distributionalism, staying closer to Saussure's ideas. When Hjelmslev (1973 [1933]) extended the structuralist analysis to the level of the signified, he made it clear that the units he discovered and the units of the signifier (stems and affixes) are not to be identified with each other. Likewise, Jakobson's (1966 [1939]) analysis of the zero morpheme reiterated Saussure's view of zero as expressing a difference by absence of a mark, not by presence of a sign with a null string as its signifier. It may be that Saussure's pedagogical metaphor of the sheet of paper, which I mentioned in the introduction, is so powerful and evocative that it necessarily leads to the Distributionalist conception of the morpheme. In any case, whatever gap existed between signifier and signified in European linguistic theory, the French structuralists would subsequently try to close it, coming closer to the conception of the sign that prevailed among American structuralists. We now know that this attempt was doomed to fail, as should have been plain from Saussure's own analysis of inflectional morphology.

By rediscovering the idea that signifier and signified are in imperfect correspondences, I argue, proponents of Process Morphology put into question one of the foundational tenets of structuralism, in a way that echoes the post-structuralists' rejection of the closed nature of the sign. But the kind of criticism one finds in post-structuralist works may be directed more to the kind of linguistic models

that post-Saussurean scholars developed, and not to Saussure himself, since he understood that signifier and signified are not always in a one-to-one relationship, and that the *langue* is a complex algebra. Interestingly, such a conception of the relationship between units of form and units of meaning is also characteristic of Conversation Analysis and their ethnomethodological approach (Hutton 1990), bringing this approach's conception of the sign closer to Process Morphology than Wetherell contemplated.

Structuralism adopted linguistics as the model discipline for the social sciences. The reactions against that move have taken many forms. In some cases they were external to each discipline. Structuralism was seen as ahistorical, and supportive of a relativistic moral theory (Pavel 2001). From an internal perspective, the static nature of the linguistic concepts in French structuralism made it into a limited theory for the study of signification. This resulted in the post-structuralist revolution in semiology, literature, and also philosophy (Lagopoulos 2010; Posner 2011), but also (as I have argued) in a return to the imperfect correspondence view of the relationship between form and content that was prevalent at the time when Saussure delivered his lectures on general linguistics.

5 Conclusion

A comprehensive evaluation of the Saussurean model in theoretical linguistics against the background of recent conceptual developments in the social sciences, then, shows that the method of the *Cours* was misunderstood, leading post-Saussurean structuralists to chain themselves to the agglutinative principle. I suggest that, by reconsidering Saussure's views about morphology, we can establish connections between the findings of process-based theories of linguistics and the discussions in other disciplines about the legacy of structuralism and post-structuralism.

Linguistics became increasingly isolated from the conceptual evolution in other disciplines, since it held on to sign-based models of language (Generative Grammar included). The criticism of structuralist treatments of morphology in realizational-global models, however, stands as an exception to this tendency. In retrospect, I argue, similar ideas can be found in Saussure's view of the *langue* as a complex algebra. Paradoxically, then, the *Cours* may contain elements of a post-structuralist conception of linguistics which may bring this discipline more in line with current developments in the social sciences. The consequences of this observation are, I believe, deserving of further study.

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