Chapter 23

The presentation of linguistic examples in the 1950s: an unheralded change

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This paper deals with a dramatic change in the presentation of linguistic examples in the linguistics literature of the twentieth century, a change coinciding (not accidentally) with the introduction of transformational generative grammar (TGG) in the 1950s. Our investigation of this change and the circumstances that gave rise to it leads us to reconsider the question of continuity and discontinuity in the history of linguistics in this crucial period, focusing on the question of the audience to which the earliest publications in TGG were directed. We argue that this was an audience of nonlinguists (information theorists and mathematical logicians) and that transformations were introduced by Chomsky, the founder of TGG, as a way to preserve, within the new paradigm of formal grammar theory, established insights of a purely linguistic nature.

1 The presentation of linguistic examples

The current practice (illustrated throughout this volume honoring John Nerbonne) of presenting linguistic examples (a) on a separate line, and (b) marked by continuous numbering, was virtually absent in the linguistics literature before 1950. Examples were presented either inline (Figure 1) or on a separate line without example numbering (Figure 2).

In identifying example numbering, we abstract away from the position of the number (preceding or following the example), but we do require that the numbering be continuous throughout the article (excluding numbered lists, such as Carmody 1945).

In *Language*, articles with example numbering in this sense did not appear before 1953. In *Lingua*, example numbering is introduced in 1955/1956. In neither journal

The limitation of interrogative forms to certain syntactic positions is quite common. Frequently we find them restricted to positions in the predicate of a binary sentence-type. The word-order and the plural verb-form in *who are they? what are those things?* are features of this kind. In present-day French, the non-personal *quoi?* [kwa¿] 'what?' is scarcely ever used as actor or goal, but instead, figures as a predicate complement, appearing in the conjunct form *que* [kə], as in *qu'est-ce que c'est?* [k ɛ s kə s ɛ¿] 'what is it that this is? what's this?' and *qu'est-ce qu'il a vu?* [k ɛ s k il a vy¿] 'what is it that he has seen? what did he see?' In some languages the interrogative substitutes are always predicates of equational sentences, as, in Tagalog, ['si:nu aŋ nagbi'gaj sa i'ju¿] 'who the one-who-gave to you? who gave it to you?' or, in Menomini [awɛ:i̯ pɛ:muhnet¿] 'who the-one-walking-by? who is walking there?'

Figure 1: Inline presentation (Bloomfield 1933).

Tenses are not clearly distinguished. The declarative form of the verb, unless modified by the future prefix, is used to express a past action, although cases occur in which only a present can be meant.

tɪqêwgaññoʻaˢk I begin to be called 94.31

In Koryak the declarative form is rarely used in narrative, while it is in common use in direct discourse.

mai, yaʻti halloo, have you come? Kor. 68.12
Vaḷvɪʻmtɪḷaˢn tɪʻnmɪn I killed Raven-Men Kor. 20.5

In Chukchee its use in narrative is very common.

eʻnmen nɪkiʻruiˢ then night came 36.12
luʻur wêthauʻñoêˢ then he began to speak 31.11

The derivative is generally used to express a present continued action, but it occurs also frequently in narrative. This use is more frequent in Koryak than in Chuckchee (see § 87).

Figure 2: Separate line (Boas 1922).

does the number of articles with example numbering rise above five per year until the mid-1960s.

In both *Language* and *Lingua*, inline presentations of examples was the norm for most of the twentieth century, but there was a clear minority practice of presenting examples on separate lines without example numbering (in *Language*, around five articles per volume throughout the period 1930-1960, with example numbering kicking in only at the end of that period).

In the 1970s, two thirds of the total number of articles in *Language* had examples on separate lines, and 75% of those had example numbering. The current practice of consistent presentation of examples on separate lines with example numbering was reached in the 1980s, at least for *Language*.

We use *Language* as a test case, because its inclusive character allows us to consider the extent to which the practice of example numbering was adopted universally, regardless of theoretical affiliation. The same point could be illustrated by comparing (theory neutral) reference grammars from before 1950, where numbering was restricted to lists, and now, where continuous numbering is ubiquitous.

The universal adoption of example numbering testifies to the usefulness of the

device. Considering this, the almost complete absence of example numbering in linguistics before the 1950s is puzzling, but we will not speculate on that issue here. Our more immediate concern is to explain the introduction of example numbering in linguistics in the 1950s, and its consequences for the history of linguistics of the period, indelibly marked by the emergence of transformational generative grammar (TGG).

2 The influence from mathematical logic

By 1950, there was already a well-established tradition of example numbering (in the sense understood here) in the formal sciences, such as mathematics and physics. We find that in the *Annals of Mathematics*, for instance, over 60% of the articles published in 1900 had numbered formulas on separate lines, and this proportion remained constant throughout the first half of the twentieth century. Figures three and four illustrate.

THEOREM.—If s_1, s_2, s_3 be the lengths of the finitely-distant infinitesimal collinear elements A_1B_1, A_2B_2, A_3B_3; and if s'_1, s'_2, s'_3 be their projections upon another right line by a pencil with any vertex; and if l_1, l_2, l_3 be certain constants, viz: $l_1 = \overline{A_1B_1} \cdot \overline{A_2B_3}^2$, $l_2 =$ etc.; and if the signs of the radicals be rightly taken, then

$$\left(\frac{l_1}{s'_1}\right)^{\frac{1}{3}} + \left(\frac{l_2}{s'_2}\right)^{\frac{1}{3}} + \left(\frac{l_3}{s'_3}\right)^{\frac{1}{3}} = 0. \tag{1}$$

So, if $t_1, \ldots t_4$ and $t'_1, \ldots t'_4$, be the areas of the finitely-distant infinitesimal complanar triangles $A_1B_1C_1, \ldots A_4B_4C_4$ and of the projections, and if their constants $m_1 = t_1 \cdot (\text{area } \overline{A_2A_3A_4})^3$, $m_2 =$ etc., then

$$\left(\frac{m_1}{t'_1}\right)^{\frac{1}{3}} + \ldots + \left(\frac{m_4}{t'_4}\right)^{\frac{1}{3}} = 0. \tag{2}$$

So, if $v_1, \ldots v_5$ and $v'_1, \ldots v'_5$ be the volumes of tetrahedrons and of their projections, then

$$\left(\frac{n_1}{v'_1}\right)^{\frac{1}{4}} + \ldots + \left(\frac{n_5}{v'_5}\right)^{\frac{1}{4}} = 0, \tag{3}$$

where the constants $n_1 = v_1 \cdot (\text{vol. } \overline{A_2A_3A_4A_5})^4$, $n_2 =$ etc.

Figure 3: *Annals of mathematics*, 1884 (Oliver).

zu ergänzen; doch soll davon vorerst abgesehen werden, weil einerseits $h(V, T)$ vermutlich klein ist gegenüber $f(V)$ und $g(T)$, andererseits weil bei Berücksichtigung eines solchen Zusatzgliedes die Endformeln wesentlich komplizierter und unübersichtlicher werden. Aus (3) und (6) ergeben sich damit für die innere Energie U sowie für C_v die Ausdrücke:

$$U = F - T\left(\frac{\partial F}{\partial T}\right)_v = \Phi_0(V) + 3Nk\,T - 3Nk\,T^2\frac{\partial g(T)}{\partial T}. \tag{7}$$

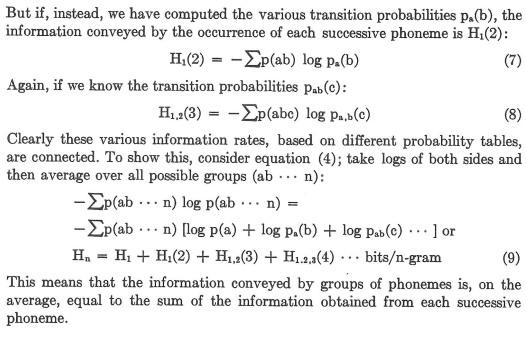
$$C_v = 3Nk\left\{1 - \frac{\partial}{\partial T}\left(T^2\frac{\partial g(T)}{\partial T}\right)\right\}. \tag{8}$$

In welcher Richtung C_v bei hohen Temperaturen vom Dulong-Petitschen Wert abweicht, hängt also von $g(T)$ ab. Es läßt sich nun qualitativ entsprechend der Überlegung von A. Eucken (a. a. O.) einsehen, daß $g(T) > 0$ ist und mit steigender Temperatur monoton wächst. Denkt man sich ein Teilchen im Gitter schwingen, so wird es bei einem bestimmten festgehaltenen äußeren Volumen V im Zeit-

Figure 4: *Annalen der Physik*, 1935 (Damköhler).

This practice from the formal sciences had been partially adopted in philosophical circles before 1950, appearing here and there in journals like *Annalen der Philosophie* and *Erkenntnis*.

The first publications in *Language* featuring example numbering (Bar-Hillel 1953; Cherry, Halle & Jakobson 1953; Lees 1953) are clearly the result of a rapprochement of linguistics and the formal sciences, and the numbered examples are in fact mathematical formulas (see Figures five and six).



But if, instead, we have computed the various transition probabilities $p_a(b)$, the information conveyed by the occurrence of each successive phoneme is $H_1(2)$:

$$H_1(2) = -\sum p(ab) \log p_a(b) \quad (7)$$

Again, if we know the transition probabilities $p_{ab}(c)$:

$$H_{1,2}(3) = -\sum p(abc) \log p_{a,b}(c) \quad (8)$$

Clearly these various information rates, based on different probability tables, are connected. To show this, consider equation (4); take logs of both sides and then average over all possible groups $(ab \cdots n)$:

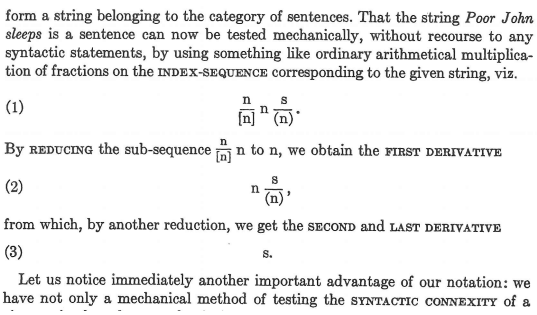
$$-\sum p(ab \cdots n) \log p(ab \cdots n) =$$

$$-\sum p(ab \cdots n) [\log p(a) + \log p_a(b) + \log p_{ab}(c) \cdots] \text{ or}$$

$$H_n = H_1 + H_1(2) + H_{1,2}(3) + H_{1.2,3}(4) \cdots \text{ bits/n-gram} \quad (9)$$

This means that the information conveyed by groups of phonemes is, on the average, equal to the sum of the information obtained from each successive phoneme.

Figure 5: *Language*, 1953 (Cherry et al.).



form a string belonging to the category of sentences. That the string *Poor John sleeps* is a sentence can now be tested mechanically, without recourse to any syntactic statements, by using something like ordinary arithmetical multiplication of fractions on the INDEX-SEQUENCE corresponding to the given string, viz.

(1) $$\frac{n}{[n]}\, n\, \frac{s}{(n)}.$$

By REDUCING the sub-sequence $\frac{n}{[n]}\, n$ to n, we obtain the FIRST DERIVATIVE

(2) $$n\, \frac{s}{(n)},$$

from which, by another reduction, we get the SECOND and LAST DERIVATIVE

(3) $$s.$$

Let us notice immediately another important advantage of our notation: we have not only a mechanical method of testing the SYNTACTIC CONNEXITY of a

Figure 6: *Language*, 1953 (Bar-Hillel).

Around the same time, Chomsky, a linguist, published in nonlinguistic journals such as the *Journal of Symbolic Logic* (Chomsky 1953) and *IRE Transactions on Information Theory* (Chomsky 1956). In these nonlinguistic periodicals, Chomsky used example numbering in our sense, though not in his article in *Language* from around the same time (Chomsky 1955). But in his 1955 dissertation and its highly influential 1957 excerpt, *Syntactic Structures* (Chomsky 1957), example numbering was employed, and in fact not just for formulas, but for linguistic examples as well (see Figure seven and eight).

The practice of example numbering for linguistic examples was taken over by early adopters of TGG, such as Saporta (1956) and Stockwell (1960), launching a steady increase of example numbering until the current situation was reached.

Suppose that $a_1, \ldots, a_n$ are inscriptions satisfying 'EI', and that $A_1, \ldots, A_n$ are the corresponding equivalence classes. Thus

(4) $A_i = \hat{x}(\mathrm{EI}x.\mathrm{SSC}xa_i)$.

If we require merely that the syntactic categories be disjoint, we may define the syntactic categories $\bar{A}_1, \ldots, \bar{A}_n$ as

(5) $\bar{A}_i = \hat{x}((\mathrm{E}t)(t \epsilon A_i.\mathrm{SSC}xt).(y)(\mathrm{SSC}xy.\mathrm{EI}y. \supset y \epsilon A_i))$.

If we require further that no member of a syntactic category bear 'SSC' to any member of any other, then we may take them as

(6) $\bar{A}_i = A_i \cup \hat{x}((\mathrm{E}t)(t \epsilon A_i.\mathrm{SSC}xt).(y)(z)(\mathrm{SSC}xy.\mathrm{SSC}yz.\mathrm{EI}z. \supset z \epsilon A_i))$.

In either case we can state in non-class terms the definition of 'same extended category' ('SEC'). Thus along the lines of (5) we have

(7) 'SECab' for '$(\mathrm{E}t)(\mathrm{E}u)(\mathrm{EI}t.\mathrm{EI}u.\mathrm{SSC}at.\mathrm{SSC}bu.(x)(\mathrm{SSC}ax \vee \mathrm{SSC}bx.\mathrm{EI}x. \supset \mathrm{SSC}xt))$'.

From (7) we can prove that 'SEC' is transitive. We see further that two inscriptions can be in the same extended category though not related by

Figure 7: Chomsky 1953.

2.3 Second, the notion "grammatical" cannot be identified with "meaningful" or "significant" in any semantic sense. Sentences (1) and (2) are equally nonsensical, but any speaker of English will recognize that only the former is grammatical.

(1) Colorless green ideas sleep furiously.
(2) Furiously sleep ideas green colorless.

Similarly, there is no semantic reason to prefer (3) to (5) or (4) to (6), but only (3) and (4) are grammatical sentences of English.

(3) have you a book on modern music?
(4) the book seems interesting.
(5) read you a book on modern music?
(6) the child seems sleeping.

Such examples suggest that any search for a semantically based definition of "grammaticalness" will be futile. We shall see, in fact,

Figure 8: Chomsky 1957.

There is little doubt, then, that the practice of numbering examples in linguistics came about under the influence of a similar practice in the formal sciences around 1950.

3 Linguistics and the formal sciences

The impact of the formal sciences on linguistics in the twentieth century has been documented extensively in Tomalin (2006). Our findings regarding the practice of numbering examples are consistent with his analysis, which identifies as the origin of TGG a need felt by Chomsky to respond to the early 1950s research program (represented by Yehoshua Bar-Hillel) in which linguistics was fused with, and perhaps reduced to, mathematical logic (Tomalin 2006: 184).

However, in Tomalin's analysis, the rapprochement of linguistics and the formal sciences took place long before the origin of TGG, and is first evidenced in Bloomfield's *A set of postulates for the science of language* (Bloomfield 1926), a call for a rigorization of linguistics echoing a similar, earlier, development in mathematics. This

rigorization was achieved by introducing the axiomatic-deductive method, in which tacit assumptions are made explicit, terms are defined, and errors can be avoided (Tomalin 2006: 55). As described by Tomalin, this method did not immediately catch on, and work in this vein was not continued until Bloch (1948) and Harwood (1955) (Bloomfield himself appears to have been more interested in the question how insights from linguistics can benefit "the language of mathematics", Tomalin 2006: 93ff).

Nevertheless, Tomalin (2006: 101) states that "Bloomfield's [...] Formalist tendencies (whether overtly or covertly expressed), which emphasised the primacy of syntactic (rather than semantic) considerations, exerted a profound influence over a whole generation of linguists that came to maturity in the 1940s and 1950s", such as Bloch, Hockett, Chao, Wells, Joos and Zellig Harris, who Chomsky studied linguistics with between 1947 and 1951 (Barsky 1997).

I refer to Matthews (1993: esp. pp. 111-128) for careful discussion of the form this influence on the post-Bloomfieldians took, centering on formalized discovery procedures for the structure of sentences based on the distribution of their constituents. Suffice it to say here that in Tomalin's analysis, formalism in the post-Bloomfieldians and in Chomsky is essentially a delayed response to Bloomfield's initial call, a derived effect of the first thrust of the impact of the formal sciences on linguistics.

From this perspective it is interesting to note that neither Bloomfield nor any of the post-Bloomfieldians, up to and including Harris, ever employed the device of continuous example numbering in their linguistic publications. But Chomsky did, right from the start, and we have to wonder why.

4 Chomsky and his audience

As Tomalin (2006) describes in detail, advances in mathematical logic in the first half of the twentieth century continued to impact the linguistics community, and he quotes Harris as calling the distributional methods of (post-Bloomfieldian) linguistics "hospitable" to the mathematical description of language. In this context, we must mention Carnap's (1934/1937) *The logical syntax of language*, Ajdukiewicz's (1936) *Syntactic connexion*, and Post's (1944) work on recursion and generative procedures. As Tomalin (2006: 103-105) notes, Harris was thoroughly familiar with these developments and understood their relevance to linguistics.

On the other hand, Harris also "was keen to stress the differences that distinguish linguistics and logic" (Tomalin 2006: 105), emphasizing that logicians like Carnap avoid the analysis of existing languages, which are the prerogative of linguistics. We find a similar concern expressed by Hjelmslev (1948: 33), also an early adopter of the formalist approach, but in a European context, who states that "logistic language theory has been carried out without any regard to linguistics, and it is obvious that logicians, while constantly talking about language, are neglecting in a somewhat indefensible way the results of the linguistic approach to language".

We submit that Chomsky in his earliest work, rather than being carried away on the new wave of algebraic linguistics, addresses this very problem of mathematical

logic being unable to accommodate traditional linguistic insights and achievements. It is here that transformations in the Chomskyan sense make their appearance (see section 5).

This entails that Chomsky's audience, in his very first publications, was not, or not in the first place, an audience of linguists, but an audience of mathematical logicians and information theorists who, in the wake of Carnap, were taking on natural language as their object of inquiry.

From this perspective it is understandable that Chomsky sought a podium like the *Journal of Symbolic Logic* and the *IRE Transactions on Information Theory* for his first publications. Moreover, it makes sense that he addressed the readers in a format they were familiar with, including the use of continuously numbered formulas and examples.

This reconstruction presupposes a certain amount of linguistic traditionalism on the part of Chomsky. While this may be surprising in view of his role as the founder of TGG, Chomsky's respect for tradition in especially morphological analysis has been amply documented in Matthews (1993), showing that the breakdown into lexical and functional elements crucial to a key argument in *Syntactic Structures* was standard procedure in post-Bloomfieldian thinking about morphology (see also Zwart 1994). But Chomsky's position vis-à-vis linguistic tradition is also evident from the discussion transcripts of the Third Texas Conference of Problems of Linguistic Analysis in English ("The process that I use for investigating language is the one that I was taught," Chomsky 1962: 174) and the Ninth International Congress of Linguists at MIT in August 1962. At the MIT conference, Chomsky was addressed by E. M. Uhlenbeck who suggested an analysis of *The man hit the ball* via a left-to-right parsing procedure yielding *the man hit* as a constituent. Chomsky rejects this suggestion immediately by referring to the venerable NP-VP (subject-predicate) analysis (Lunt 1964: 983). Chomsky's frequent references to Jespersen and Humboldt throughout his career also underscore his respect for linguistic tradition.

In personal communication (March 31, 2015), Chomsky described his displeasure with the general tendency in post-war American academic circles to overhaul science with disregard for European accomplishments. As Chomsky noted, this affected European scientists who had immigrated to the United States before or during the war and had great problems gaining acceptance on the American scientific and cultural scene, citing Roman Jakobson as a telling example. The outcome of the war led to a certain triumphalism, in which information theory was the name of the game, and people working in that field were ignorant about language as studied in the structuralist tradition (see also Chomsky 1975: 39-40).

This is the context in which Chomsky's public discussion with Yehoshua Bar-Hillel, documented in *Language* (Bar-Hillel 1954; Chomsky 1955; see also Tomalin 2006: 125f and Hiorth 1974) must be understood. Bar-Hillel worked with Carnap as a postdoc in 1950 and headed the first machine translation lab at MIT from 1951 on (Bar-Hillel 1964: 5-6). Chomsky and Bar-Hillel were "extremely close" (Barsky 1997: 54), and Bar-Hillel appears to have been one of the few colleagues who paid attention to Chomsky's early work, including his 1951 BA-thesis (ibid.). In his reminiscences Bar-Hillel

(1964: 16) calls Chomsky "the founder of algebraic linguistics and by far the best man in this exciting new field", adding, tellingly, "though Chomsky himself would probably claim that it is not really new at all, but just plain good old linguistics, pursued with the best means available at our time, which happens to be of algebraic nature". Nevertheless, Chomsky and Bar-Hillel differed on the value of artificial language research for natural language linguistics, which appears to have been at the core of the discussion (Tomalin 2006: 136-137) (we are ignoring here another important point of disagreement, regarding the value of logic for the study of meaning in natural language).

At the same time, Chomsky felt alienated from the main trend in post-Bloomfieldian linguistics, championed by Harris (1951), of establishing discovery procedures (Matthews 1993: 135f; Tomalin 2006: 149f), and in this again he and Bar-Hillel came to share the same view (Tomalin 2006: 71).

We suggest that this complex situation, in which Chomsky felt at the same time a close affinity with Bar-Hillel, yet felt compelled to defend linguistic analysis against appropriation by the mathematical logicians and information theorists that his friend represented (cf. Tomalin 2006: 184; see also Chomsky 1975: 40), determined both Chomsky's publication strategy as well as his chosen style of presentation. This style turned out to be the one common in mathematical logic, in particular in the use of numbered examples.

5 The origin of transformations

We have established that Chomsky directed his earliest publications at an audience of mathematical logicians and information theorists, and that this orientation provides a natural explanation for his adoption of example numbering. We believe this casts a new light on the origin of transformations in TGG. *Transformation* was a familiar term to both mathematical logicians (Carnap) and post-Bloomfieldian linguists (Harris), but as employed by Chomsky their function, of providing phrase structure grammars with the necessary linguistic sophistication, was entirely new.

As is well known, Chomsky's main argument in his early work, including *Syntactic Structures*, was that "phrase-structure grammars are inadequate in strong generative capacity" and that "linguistic theory requires a new and more abstract level of description, the level of grammatical transformations, and a richer concept of grammar" (Chomsky 1975: 8). The resulting transformational generative grammar (emphasizing *transformational*) is able to "express rather subtle aspects of the form and interpretation of sentences" (ibid.).

The two-step process of generation and transformation was familiar to both mathematical logicians/information theorists and post-Bloomfieldian linguists. Carnap in his *The Logical Syntax of Language* (1937) describes language as a calculus, the rules of which determine both the formation ("the syntactical rules in the narrower sense", Carnap 1937: 2) and the transformation of linguistic expressions; the transformations are just rules of logical inference among expressions (ibid.; see also Tomalin 2006: 159). In linguistics, too, the term transformation was familiar, from Harris (1951), al-

though Bar-Hillel (1954) was quick to point out that Harris' transformations were actually formation rather than transformation rules in the Carnapian sense. That the description of language structure is essentially a generative system (in the sense of Post 1944) is more or less implicit in Harris (1951, e.g. 1951: 372-373), and was apparently common thinking among structuralist linguists in the mid-1950s (Matthews 1993: 134). So here, too, the generation-transformation dichotomy was a familiar concept.

Chomsky has later (1975: 43) expressed regret for using Harris' term transformation in this different sense, potentially confusing his linguistic audience (see Tomalin 2006:159ff and Nevin 2009 for a comparison of transformations in Harris and Chomsky). But from the perspective that Chomsky was writing primarily for an audience of mathematical logicians and information theorists, such confusion could hardly have been expected (and in fact did not arise). For Chomsky introduced his transformations as "supplementary rules" in response to demonstrated limitations of phrase structure (e.g. Chomsky 1957: 44), putting a damper on expectations among his audience that the expressions of natural language could be derived just by rules of phrase structure grammar in any simple and explanatory way.

It is important to note that transformations are called upon by Chomsky to describe the most elementary properties of natural languages, which were well understood among linguists, but perhaps less so among representatives of mathematical logic and information theory. These properties include conditions on conjunction reduction, intricacies of verbal morphology, active-passive relations, negation, question formation, *do*-support, ellipsis, auxiliation, nominalization, pronominalization, etc. (Chomsky 1957: chapters 5 and 7). Thus, while we agree with Tomalin that the origin of TGG lies in the association of linguistics with the formal sciences (2006: 186), the crucial part in that association was the introduction of transformational analysis, championing the cause of 'good old linguistics' against ill-informed logicians and information theorists.

6 Conclusion

We have argued for a second and decisive moment in the history of linguistics in which the language sciences underwent the influence of formal sciences, in particular mathematical logic (following the first instance, marked by Bloomfield 1926). Unlike the first instance, this renewed rapprochement changed the face of linguistics forever, in leading to the introduction of continuous example numbering in linguistic writing. This introduction of example numbering came about in linguistic publications directed at an audience of mathematical logicians and information theorists, and is first attested in journals from those fields, and then in articles in linguistics journals featuring mathematical formulas. We submit that the practice of numbering examples had its origin in Chomsky writing for an audience of nonlinguists, in a style with which his intended audience was more familiar.

In this context, we observe a parallel between Chomsky's use of example numbering and his introduction of transformations (in his sense). Both transformations and

numbered examples were formal devices familiar to his intended audience of logicians and information theorists, and in Chomsky's early work both devices served to infuse the current (mathematical) discourse with pure linguistic content. Just as transformations served as a conduit for linguistic sophistication in the new field of algebraic linguistics, so natural language examples assumed the place of mathematical formulas, presented on a separate line and continuously numbered, as they have been ever since.

Acknowledgements

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Source of illustrations

Figure 1: Bloomfield 1933: 260.
Figure 2: Bogoras 1922: 772.
Figure 3: Oliver 1884: 40.
Figure 4: Damköhler 1935: 4.
Figure 5: Cherry, Halle & Jakobson 1953: 45.
Figure 6: Bar-Hillel 1953: 48.
Figure 7: Chomsky 1953: 251.
Figure 8: Chomsky 1957: 15.

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