Structures in the Mind

Essays on Language, Music, and Cognition in Honor of Ray Jackendoff

edited by Ida Toivonen, Piroska Csúri, and Emile Van Der Zee

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12 Sleeping Beauties

Willem J. M. Levelt

12.1 Mendel's Laws: The Prototype of Scientific Rediscovery

During the decade around 1860 Gregor Mendel ran his classic experiments on the hybrids of pea plants in the botanical garden of his Augustine monastery in Brünn, Austria. There he discovered the basic principles of heredity, later called Mendel's laws: the law of segregation (the existence of dominant and recessive traits) and the law of independent assortment (traits being independently inherited). In 1866 he published these discoveries as "Versuche in Pflanzenhybriden" in the journal of the local natural science society, not exactly a journal that featured on Charles Darwin's shelves. Mendel then became abbot of his monastery and spent little further effort on promoting his discoveries. They became sleeping beauties for the next three decades. By the end of the 1890s, four princes, more or less independently, kissed them back to life: Hugo de Vries from Amsterdam, Erich Tschermach-Seysenegg—assisted by his brother Armin—from Vienna, and Carl Correns from Tübingen. Their papers, all three reporting the rediscovery of Mendel's laws, appeared almost simultaneously in 1900, two of them acknowledging Mendel's priority, the third one, Hugo de Vries, soon joining in.

This is undoubtedly the most famous case of rediscovery in modern science. However, rediscovery is not limited to the natural sciences. The present chapter will review a number of sleeping beauties in linguistics and psycholinguistics—discoveries, tools, and theories that reawakened after long periods of slumber. I came across them while writing *A History of Psycholinguistics* (2013).[1] One of these beauties, the first to be discussed, was kissed back from enchantment by Ray Jackendoff in his theory of consciousness (1987).

12.2   Heymann Steinthal on Consciousness

The discovery of the Indo-European language family by the end of the eighteenth century engendered a concerted search for the proto-language from which these languages had evolved. It was a search for the *Ur-Wurzeln*, the original lexical core roots from which all later lexicons had evolved. Sanskritist Max Müller, for instance, didn't hesitate to claim that there were 121 core roots: "These 121 concepts constitute the stock-in-trade with which I maintain that every thought that has passed through the mind of India, so far as it is known to us in its literature, has been expressed" (Müller 1887, 406).

   With the widely accepted notion of a proto-language, with its core of lexical roots, a dilemma arose for linguists. Should they try to explain how these roots in their turn had come about, or should they simply stop at this so-called "root barrier"? Among those refusing to go beyond the "root barrier" were leaders such as Franz Bopp, August Pott, August Schleicher and William Dwight Whitney. But others, such as Max Müller, Lazarus Geiger and Ludwig Noiré were more adventurous, coming up with wonderful stories about how primordial human society produced its first lexical roots.

   Heymann Steinthal (1823–1889) was the first to develop just for that purpose a serious psychology of language. We may in fact consider him as the inventor of psycholinguistics. Steinthal was a comparative linguist, he taught at the Hochschule für die Wissenschaft des Judentums in Berlin. He was overly impressed by the work of Wilhelm von Humboldt, in particular his indeed original idea that language is not a bunch of texts, as studied by the historical linguists, but an activity of mind. For Humboldt, *language is what the speaker does.* Linguistics should explain how this works and this requires a developed psychology. "Succesful advances in the science of Linguistics are dependent on a mature Psychology,"[2] Steinthal wrote in 1855 (234), but there was no advanced psychology around. Together with his life-long friend Mauritz Lazarus, Steinthal founded in 1859 the *Zeitschrift für Völkerpsychologie*. They argued that the psychology needed was an ethnic, social, or in modern terms, anthropological psychology. Curiously enough, Steinthal never developed anything of the sort. The psychology he adopted was Herbart's.

   Johann Friedrich Herbart was Immanuel Kant's successor in Königsberg. He developed a very clever mathematical psychology of how ideas (*Vorstellungen*) get in and out of consciousness, mutually associating or dispelling each other (Herbart 1824). Herbart provides the precise

differential equations that govern this "mental mechanics." The basic idea is quite simple. Consciousness is like a stage. On the stage are one or a few actors; it cannot contain more. All other actors push to get onto the stage, using their associations to actors on the stage, and dispelling other actors from the stage. Below consciousness are conglomerates of associated ideas. New ideas on the stage are easily drawn into existing conglomerates, for instance by similarity. This process is called *apperception*. The conglomerate into which a new idea gets associated, Herbart calls the *apperceptive mass*.

Steinthal further developed this theory in order to explain how an original spontaneous vocal response to some exciting, consciously perceived event got perceived, landing on the stage of consciousness. The short co-presence of perceived sound and perceived event on the stage of consciousness leads to their association because they share the affect of excitement. Here is an *Ur-Wurzel* (primal root) *in statu nascendi*. Steinthal developed this theory in exceeding detail, including a phenomenology of consciousness far ahead of its time.

What do we mostly have on the stage of our consciousness? Steinthal's answer was: words, language, and specifically inner speech. Inner speech, according to him, is the consciousness of the connection of a word to its apperceptive mass. Psychologically speaking, the apperceptive mass is the word's meaning. It is the conglomerate of ideas we have come to associate with that particular spoken word. Meaning almost never enters consciousness itself because of its complexity. Consciousness is too narrow for it. What consciousness can contain is the internal speech form; that is the consciousness of the word's connection to the dark apperceptive mass below. We "translate the content of our thoughts in words . . . the content sends its word substitutes into consciousness because it cannot get there itself"[3] (Steinthal 1881, 437).

Steinthal now drastically narrows the notion of "idea." In the civilized language user practically any idea is a word-idea. Any idea in consciousness is just the abstract reference of a word to its unconscious meaning conglomerate. This internal speech form itself has little or no content, but in the listener it can activate the underlying apperceptive mass, which is, psychologically speaking, the word's meaning.

Steinthal then goes on to discuss the economy of language and thought. Words in consciousness are only *lightweight* references to the underlying, unconscious apperceptive structures, their "meanings." Any thinking or creative mental process is unconscious, according to Steinthal. It is the never ending apperceptive interaction of association and dissociation

among unconscious conglomerates. These highly complex events are consciously represented as words and sentences. In this way, lightweight consciousness can represent and affect heavyweight unconscious thought processes.

This is almost exactly Ray Jackendoff's theory of consciousness, initially outlined in Jackendoff (1987) and (1997). "We experience language as organized sequences of sounds . . . the *content* of our experience, our understanding of the sounds, is encoded in different representations, in particular conceptual structure and spatial representations. The organization of this content is completely unconscious" (1997, 189). In 2007 Jackendoff writes that we are conscious of our thoughts "not through awareness of the thoughts themselves, but through the awareness of phonological structure associated with thoughts" (Jackendoff 2007, 84). In Jackendoff (2012), this is called the "unconscious meaning hypothesis" (90) and the author acknowledges Steinthal's original work. Conscious inner speech is phonological, according to Jackendoff. We are never conscious of word class, syntax, or even meaning. We are only conscious of the *meaningfulness* of our phonological images. A classic insight indeed.

12.3   Sigmund Exner on Cohort Theory

Sigmund Exner (1846–1926) was a brilliant Viennese neurologist. He had been a student of Hermann von Helmholtz, he was co-inventor of the gramophone record, with which he established the Sound Archive in the Austrian Academy, an institution still in existence. He had also proposed a graphic/writing center in the brain, but here I want to mention Exner's invention of cohort theory.

In 1978, William Marslen-Wilson, as a member of the beginning Max Planck enterprise in Nijmegen, formulated his cohort theory together with Alan Welsh. It is a theory of how we recognize spoken words. The core idea of cohort theory is that the initial speech sound of a word activates all words in the listener's lexical memory beginning with that sound. As further speech sounds follow, the initial cohort of activated words narrows down, step by step, excluding non-fitting members until just a single word, the target, remains. Marslen-Wilson and his research team developed entirely new experimental paradigms to test the theory, which as a consequence went through several subsequent versions. The theory made quite non-trivial predictions, which made it an attractive experimental target. The strictly incremental nature of the activation predicted

that we cannot recognize a word when its initial speech sound is experi-mentally changed. We will not recognize *cold* when we hear *told*. Still, we might recognize the spoken non-word *gypothesis* as *hypothesis*. Later versions of the theory allow for slight activation of (candidate) words that were not in the original cohort (in the example the word *hypothesis*). Another attractive feature of cohort theory is the notion of "uniqueness point." Each new incoming speech sound further reduces the cohort, till just one candidate word is left, which is then recognized as the target word. That can happen before all of the word's speech sounds have come in. Take the word *snorkel*. When the input has reached the stage *snor-* then the cohort has been reduced to *snorkel, snorer, snort, snorter,* and *snorty*. But as soon as *k* comes in, only *snorkel* remains. Hence, speech sound *k* is *snorkel*'s uniqueness point. A word's uniqueness point thus depends on the set of word-initial alternatives in the listener's lexicon. The theory predicts that a word is recognized as soon as its uniqueness point is reached. This was nicely confirmed in the initial experiments, and the notion is still a basic one in spoken word perception.

Sigmund Exner had been ahead of Marslen-Wilson by over eight decades. He formulated the essence of the theory in 1894. Here is the relevant text in English translation (from Levelt 2013, 81):

When you for instance hear the sound *K*, with [. . .] very low intensity the traces are activated which in many earlier cases were simultaneously active with the perception of *K* and which correspond to the images of "Knabe" [*boy*], "Kuh" [*cow*], "Kirsche" [*cherry*], "Kugel" [*ball*], "Kern" [*kernel*], etc. [. . .] This activation doesn't disappear however with the disappearance of the sound *K*, but continues [. . .] as a trace for a duration of a number of seconds [. . .]. If during the existence of this activation [. . .] also the sound *I* is heard, then a further bit of activation will be received by those traces that are associatively connected to the sound *I*. This should not mean that the image of Fisch [*fish*] is not also activated by the *I*-sound because of its connection to the *I*-sound, but it is obvious that all images whose name begins with *KI* have a remarkable advantage, because they were already activated by the previous *K*-sound. [. . .] Hence, the image "Kirsche" will be closer to the activation value needed for clear consciousness as the image "Fisch." In addition, it [the *I*-sound] will [. . .] suppress the vague images "Knabe," "Kuh," "Kugel," "Kern," etc. [. . .] ["Kirsche"] will however still be at the same activation level with other words beginning with "Ki" [. . .]. If then the further sound *R* is added, the total activation process of the traces in the brain is nar-rowed down following the same principle, so that only the traces representing the images "Kirsche" and "Kirche" are activated; the further sound *Sch* then hits a relatively very small number of active brain traces, but it is intensive and it will, during the pause that follows completion of the word, develop itself into the full activation of the image traces of "Kirsche."[4] (German original: Exner 1894, 307–308)

Exner does not formulate a notion equivalent to "uniqueness point," but he does allow for words outside the word-initial cohort to be also activated by later speech sounds. He mentions the word *Fisch* (fish), which will also receive some activation from second speech sound *i*.

I have not seen a single later reference to Exner's cohort theory. Neither Exner nor anybody else set out to test the theory experimentally, although this would in principle have been possible at some time before Marslen-Wilson re-invented the idea. It would certainly have speeded up our understanding of spoken word perception.

12.4   Rudolf Meringer and Carl Mayer on Speech Errors

A most remarkable sleeping beauty has been Rudolf Meringer and Carl Mayer's (1895) theory of speech errors and its further extension in Meringer (1908). There is indeed great beauty here. The thoroughly data-based theory is the first to explain speech errors from an explicit psychological theory of utterance production, a theory that in its essentials still stands today. It is, moreover, almost incomprehensible how this work could suffer the fate of a decades-long sleep state. Let us shortly consider these two features of the case.

The linguist Rudolf Meringer (1859–1931) was born in Vienna, and held teaching positions there and, since 1899, in Graz. He was a confirmed empiricist: "one who cannot observe is not a researcher, but a bookworm"[5] (Meringer 1909, 597). His grand empirical project became the systematic collection, analysis, and psycholinguistic explanation of spontaneous speech errors. Meringer organized the systematic collection by involving the participants in a regular lunch-time meeting. They agreed to stick to certain rules, such as speaking one person at a time and halting all conversation as soon as a tongue slip occurred. The latter would allow for proper recording of the error and for immediate introspection on the part of the speaker concerned. This procedure introduced an important methodological feature: *all* occurring speech errors were recorded, not just the remarkable, interesting, or funny ones as had been the tradition, and as would regrettably become the tradition again. Medical doctor Carl Mayer was only marginally involved with data collection and analysis and not at all with the writing. However, his co-authorship was important for Meringer because it would mark empirical speech error research as natural science. The total corpus recorded amounted to some 2500 slips of the tongue.

The three basic error categories Meringer distinguished are still in good use: exchanges, anticipations, and perseverations, and the core observation in all three categories was that the exchanged elements are functionally similar. In the exchange *denile Semenz*, for instance, two word-initial consonants are exchanged, the anticipation *lässen nämlich* (for *lassen nämlich*) involves two stressed vowels in word-initial syllables, the perseveration *konkret und kontrakt* (for *abstrakt*) perseverates the first word-initial syllable as the second word's initial syllable. Meringer considered speech errors as resulting from the regular speech producing mechanism: "Only attention fails in a speech error, the machine runs without a supervisor, is left to its own devices"[6] (Meringer and Mayer 1895, vii). Linguistic elements, whether consonants, vowels, syllables, roots, prefixes, suffixes, words, or phrases get ordered by the production machine. They should end up in particular target positions. There are always multiple elements simultaneously conscious in "inner speech." Occasionally, an active element ends up in a wrong but functionally similar target position, with an ordering error as outcome. Target positions differ in weight. Word-initial consonants, for instance, are heavy. Vowels in unstressed syllables are light. Heavy elements have better access to consciousness than light elements and hence are better intruders into functionally similar target positions. Meringer's weight hierarchy is a good predictor of the frequency distribution of the sound errors he had observed. We will not go into further details of the "cogs" in Meringer "clockwork" (his own terms: *Räder*, *Uhrwerk*), but they have stood the test of time. They figure in one way or another in all modern theories of error generation. If any work deserves the qualification that Georg Mendel expressed about his own work, it is Rudolf Meringer's: "It still requires some courage to submit oneself to such a far going enterprise; but it seems nevertheless to be the only proper way" (Mendel 1866, 4). That, however, was not appreciated for almost seven long decades.

How did this wonderful work get lost? One source of obliteration has been Sigmund Freud's psychoanalysis of speech errors. The first edition of his *Zur Psychopathologie des Alltagslebens* (1901) makes reference to Meringer and Mayer's book as a *Vorarbeit* ('preliminary work') to his own. However, their views are "*fernab von den meinigen*" ('far away from my own'; Freud [1901] 1954, 52–53). He then does away with the proposed mechanical explanations: "*In a major set of substitutions slips of the tongue fully ignore such sound laws*"[7] (Freud's own emphasis, 74). He then comes up with a number of speech errors, some from Meringer and

Mayer, many more from his own or his colleagues, supporting an entirely different story: speech errors result from something suppressed from consciousness, forcing its way out. For example, "Sie werden Trost finden, indem Sie sich völlig Ihren Kindern *widwen*" (target: *widmen* 'devote') — spoken by a gentleman to a beautiful young widow ('you will find consolation in fully *widowing* yourself to your children'). Here is Freud's explanation for this mechanically obvious perseveration, "the suppressed thought indicated a different kind of consolation: a beautiful young widow will soon enjoy new sexual pleasures." No wonder that Meringer describes such analyses as "jenseits von gut und böse" ("beyond good and evil"; 1908, 129). In subsequent editions of *Zur Psychopathologie des Alltagslebens*, Freud's stories become ever wilder and more offensive to Meringer. Ultimately, after its sixth edition in 1919, Meringer had had enough, and wrote a detailed, totally devastating and hilarious review (Meringer 1923). After carefully "deconstructing" Freud's phantom interpretations case after case, Meringer concludes, "How much clearer spoke Pythia than the way Fate reveals itself to modern Freud-humans! One should even despair, if the same Fate hadn't also blessed the same human beings with psychoanalysis"[8] (140). However, it was to no avail. Freud's story telling about speech errors had conquered the world; in 1923, the 11th printing of the English edition became available already.

This brings us to the other cause of obliteration. There was never an English translation of Meringer and Mayer's (1895) treatise. After World War I, and especially after the establishment of the Third Reich in 1933, the center of gravity of psycholinguistics shifted to the Anglo-Saxon world, especially North-America. As we will consider, research lines were drastically broken, knowledge of German was limited, and mental machinery was anathema for dominant behaviorism. Behavioristic psycholinguistics culminated in Burrhus Frederic Skinner's *Verbal Behavior* of 1957, or rather already in his William James Lectures of 1947, which was generally considered as holy writ. *Verbal Behavior* is essentially a book about the speaker, in which the theoretical framework of operant conditioning is applied to the phenomena of language production—an enormous scaling up from elementary behaviors of rats and pigeons in Skinner boxes to the most complex of all behaviors, speaking. Not surprisingly, the book lacks an empirical, let alone experimental, basis; it is a discursive text. It does however discuss speech errors. They can occur when two verbal "operants" (verbal responses such as *snarl* and *tangle*) have the same strength and become simultaneously emitted (as *snangle*). Here, Skinner rejects Freud's approach to look for explanations in highly

selective observations: "A careful study of large samples of recorded speech would be necessary to determine the relative frequency of different types of fragmentary recombination" (294). But Skinner makes no reference to Meringer and Mayer, who had done just that. He should have known better because the one source he used for his slip examples was Wells (1906), an English monograph that makes repeated reference to Meringer and Mayer. He either wasn't able or willing to consult that German monograph or he decided to ignore it because of its psycho-mechanical explanations—or probably both. As a result, Skinner left the issue without a new empirical basis, that is, an unbiased corpus of spontaneous speech errors, and without theoretical explanation.

However, the cognitive revolution was already on its way, and linguists began systematically collecting error corpora, analyzing them linguistically, and providing explanations in line with Meringer's, and making due reference to his work. To the best of my knowledge the first prince to kiss this sleeping beauty was the Dutch linguist Anthony Cohen (1968), but he was soon followed by many others on both sides of the Atlantic. Ann Cutler and David Fay erected a monument for Meringer and Mayer in 1978 by editing a facsimile reproduction of their 1895 book, with an introduction that offered a detailed and lucid discussion of both the empirical and theoretical accomplishments of this work, which they characterized as "modern" in all major respects.

12.5 Wilhelm Wundt, Grammarian of Sign Language and Inventor of Phrase Structure Diagrams

Theorizing about language origins has always fluctuated between surmising vocal or gestural origins. Steinthal, we saw, opted for a vocal theory. Sign languages or their precursors have, according to him, no grammatical categories because they lack inflections and particles. This was in fact the dominant view during the second half of the 19th century. But Wilhelm Wundt (1832–1920) took the opposite position. Language, he argued, originated from a gestural base. The deep motivation for composing his magnum opus *Die Sprache* (1900) was to provide the ultimate psychological theory on the origins of language. We can still observe the primordial state of language in the spontaneously arising, natural, and largely universal sign language of the Deaf, Wundt sustained, and sign language is grammatical.

How do signers express their thoughts? It starts out by being conscious of some state of affairs that they want to express, which Wundt calls the
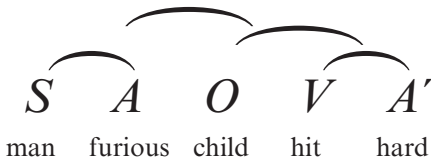
S   A   O   V   A′

man   furious child   hit   hard

Figure 12.1

Gesamtvorstellung, the "total image." The signer then successively focuses on elements of three kinds in that total image: entities, properties, and states. Here, elements that are salient in the total image get precedence over less salient elements. The elements can entertain a small set of binary, logical relations to one another, such as *subject-predicate* (subject = what the sentence is about) or *modification* relations.

Here is an example from sign language. Wundt was the first to produce a (very partial) grammar of Deaf sign language. In this example, the deaf person's Gesamtvorstellung is of *the furious man hitting the child hard*. Most salient is (the) *furious man*. It is focused on first. Its elements entertain a logical, binary relation of modification. In sign language, according to Wundt, the modifier follows the modified. That also holds for the other modifier relation between *hit* and *hard*. Another binary relation in the total image that the signer will focus on is between *hard hitting* and (the) *child*. Finally, there is the highest level partition in the Gesamtvorstellung, between subject and predicate: the sentence is about (the) furious man, and what is said about him is that he hits (the) child hard. Wundt argues in much detail that sign language is an SOV language, but his work on sign language went into oblivion. We would have to wait for six decades before the next grammar of a sign language appeared (Stokoe 1960).

In the final chapter 9 of *Die Sprache*, Wundt goes through an amazing tour de force in spelling out how spoken languages emerged from sign language. We will not follow him there. What is relevant here is that Wundt was the first to draw phrase structure diagrams, such as the one above. They are at the same time structural representations of logical, grammatical relations and representations of the partitioning process involved in the generation of sentences. Wundt introduced these diagrams in his *Logik* (1880), but then went into much more detail when developing his theory of the speaker in *Die Sprache*. Here is a phrase structure diagram for a sentence produced by speaker/writer Johann Wolfgang von Goethe:
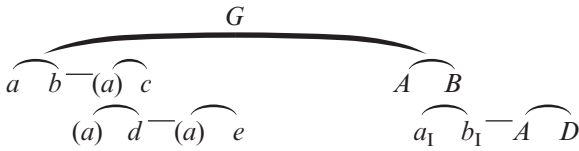
Figure 12.2
Als er sich den Vorwurf sehr zu Herzen zu nehmen schien (a⌢b) und immer aufs neue beteurte (c), daß er gewiß gern mitteile (d), gern für Freunde tätig sei (e), so empfand sie (A⌢B), daβ sie sein zartes Gemüt verletzt habe (a$_1$⌢b$_1$), und sie fühlte sich als seine Schuldnerin (A⌢D). [As he seemed to take the reproach to heart (a⌢b) and again and again proclaimed (c) that he certainly gladly intimated (d) to be eagerly active for his friends (e), then she experienced (A⌢B), that she injured his tender heart (a$_1$⌢b$_1$), and she felt indebted to him (A⌢D).]

It represents two types of connection: logical ones (curved arcs) and associative ones (straight arcs). Logical connectors are always binary partitionings; associative connections can create strings of arbitrary length (*Hans is blonde, tall, kind, . . . and fresh*).

These were the first phrase diagrams in linguistics, but also the last to be seen for half a century; Nida reintroduced them in 1949. He had not yet used them in the first, 1946 edition of his text, but the second edition featured on page 87 this phrase diagram, the very first diagrammatic representation of an IC (immediate constituent) analysis:
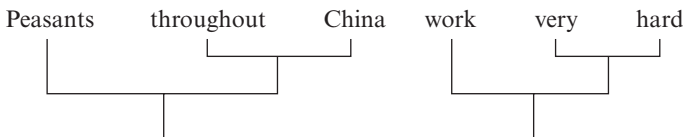

Figure 12.3

This is in particular surprising because Leonard Bloomfield, the father of IC analysis, had paid a study visit to Germany (1913–1914) and Leipzig in particular, where he attended Wundt's lectures. He was deeply impressed. In his preface to *An Introduction to the Study of Language*, Bloomfield (1914) wrote: "It will be apparent, especially, that I depend for my psychology, general and linguistic, entirely on Wundt" (vi). For a century, this textbook was the best English-language introduction to Wundt's theory of language. But it did not contain a single phrase diagram. For some reason, Bloomfield denied himself the luxury of using the obvious formal tool for representing his immediate constituent analyses.

12.6 Adolf Reinach and Hans Lipps on Speech Act Theory

Whereas Wilhelm Wundt took the speaker's perspective in his theory of language, Philipp Wegener took the dialogical perspective in a still attractive text of his from 1885: "The purpose of our speaking is always to influence the will or knowledge of a person in such a way as seems useful to the speaker"[9] (1885, 67). Speakers will either try to involve the listener in their own states or value judgments or, alternatively, express their involvement with the listener's states or value judgments. Wegener then sketches the ethical dimension of dialogue, which proceeds from its function of affecting the will of the interlocutor.

Lawyer and student of Husserl's, Adolf Reinach (1883–1917) was the first to formulate the quasi-legal nature of dialogical speech acts (Reinach 1913). A command, for instance, "is an action of the subject to which is essential not only its *spontaneity* and its *intentionality* towards *alien subjects*, but also its *need of being perceived*"[10] (707). Social acts are initiated by ego ("spontaneous") and are intended to be perceived. This holds as much for commands as for requesting, admonishing, questioning, informing, or answering. They are all "cast to an alien subject, in order to pitch into his mind" (um sich in seine Seele einzuhacken; 707). These, clearly, are the "performatives" of modern speech act theory. An essential feature of social acts, in particular speech acts, is that they are registered by the intended audience. These social acts always have a purpose and a presupposition. A command, for instance, has as its purpose to induce some response in the interlocutor. Its presupposition is the speaker's will that the response is executed. This is nowadays called the "sincerity condition" of the speech act. Reinach also introduces the notion of commitment (*Verbindlichkeit*) in his speech act theory. Reinach died at the age of 32, which tragically broke off the further development of his speech act theory, but the notion of commitment was further worked out by Hans Lipps ([1937, 1938], republished in 1958). Hans Lipps (1889–1941), along with Adolf Reinach, had belonged to the Göttingen Philosophical Society formed around Edmund Husserl. Later he also became a botanist and a medical doctor. His 1938 paper was entitled "The binding nature of language" (Die Verbindlichkeit der Sprache). It maintained that each spoken word implicates a commitment and the addressee "executes" (*vollzieht*) the meaning of the words. In case of a promise, for instance, the addressee is informed about the speaker's intention and is at the same time "accepting" it, "taking the speaker's word." For the speaker, on the other hand, the promise is an assurance that he vouches for his words.

   Neither Adolf Reinach nor Hans Lipps are referred to in John Austin's famous 1955 William James Lectures (Austin 1962), but they had certainly been pioneers of speech act theory.

12.7   Max Isserlin on Telegram Style as Adaptation in Agrammatism

Hermann Steinthal had introduced the term *akataphasia* for the inability of certain aphasic patients to build sentences in spite of the fact that the underlying thought or judgment is intact. Adolf Kussmaul, in his wonderful 1877 text on disorders of language, recognized the same syndrome calling it agrammatism, the term we still use. It is "the inability to inflect words appropriately and to syntactically order them into sentences"[11] (164). A more detailed analysis of agrammatic speech style was undertaken by Carl Wernicke's students Karl Bonhoeffer (1902) and Karl Heilbronner (1906). They characterized this style as *telegraphic*. Heilbronner argued that this style was not voluntary but a real syntactic inability, a primary effect of a lesion in the speech motor area.

   This was the state-of-the-art when Max Isserlin (1879–1941) published his paper "Über Agrammatismus" (1921). The paper includes extensive protocols of the spoken and written texts of three agrammatic patients. Here is an utterance of case 1 (WD), who describes how his brother-in-law was killed:

> Thief been—brother-in-law at job, nothing noticed at all—2 days—thrown in the Pregel—in Königsberg anyhow very bad—just Goldmarks—nothing to eat. Killer found later—taken out of bed worker.[12]

Isserlin summarizes this style of speaking as follows: the patient shows "the correct telegraphic style as a free form of expression.—This telegram style does not involve real slips in word forms (wrong case, flexion). It is essential that the patient rejects the grammatical mistakes and selects the correct forms offered to him, with great certainty." The patient has "a lively awareness of his own defective speech." The patient can give up his telegraphic style under certain conditions, for instance in retelling or in teaching, approaching normal speech, however with occasional errors. Isserlin stresses that "correct pure telegraphic style is neither incorrect nor erroneous speech. It is rather a lawfully existing way of speaking, developed in the history of mankind" (394–395). Telegraphic style, Isserlin (1936) argues, is the patient's free adaptation to his speech need: "The notion of telegraphic agrammatism as a need phenomenon is supported by the fact that the same patient can choose other forms of utterance in situations of less speech need—in writing—and produce

relatively correct grammatical expressions" (749). Or as one of his patients put it: "Sprechen keine Zeit–Telegrammstil" ('Speaking no time—telegramstyle'; 1921, 408).

Steinthal (1881) had already considered this speech need. In order to build a sentence, the speaker must keep the underlying meaning conglomerates "vibrating," because consciousness can only hold one word. If the activation of the relevant sub-conscious meanings is too short-lived, establishing their syntactic relations and ordering cannot be achieved. This insight got lost in history. Haarmann and Kolk (1991) re-introduced it in their computational theory of agrammatism. During the same period Kolk and Heeschen (1990) published their adaptation theory of agrammatism, arguing in much linguistic detail that many agrammatic patients freely opt for a grammatically correct, but less demanding, telegraphic style. They had become aware of Isserlin's work, which had been lost for over half a century. Here, as in so many other cases, the Nazi-regime had silenced a leading scientist. During World War I, young Max Isserlin had begun establishing a clinic for brain damaged war victims in Munich. He directed that federal clinic until 1933, when he was dismissed for being a Jew. But he stayed in charge of the annex Bavarian state hospital. There he was dismissed in 1938, ultimately leaving the country at the last moment in 1939. He emigrated to Sheffield, England, where he died in 1941.

12.8   Who Was the Wicked Fairy?

We have considered seven sleeping beauties: Steinthal's theory of consciousness, Meringer's analysis of spontaneous speech errors, Exner's cohort theory, Wundt's grammar of sign language and his introduction of tree diagrams, Reinach's and Lipps's invention of speech act theory and, finally, Isserlin's adaptation theory. How come such remarkable scientific discoveries, tools, insights, or theories fall into oblivion? There are specific, but also more common impediments. Mendel's case is rather specific, though not unique. He did not work in an academic setting and science was not his main occupation, especially after becoming abbot of his monastery in Brünn, shortly after publication of his paper. A somewhat similar case in psycholinguistics was John Ridley Stroop's discovery of what is now called the Stroop effect: naming the color of a printed word is exceedingly slow if that word is the name of a different color. Stroop's paper, essentially his dissertation, was published in 1935. It was to be his last scientific paper. He devoted the rest of his life to religion,

writing religious texts, teaching bible classes, and preaching in his local Nashville community. It took almost two decades before Stroop's paper returned to the scientific agenda. By now it is the most cited paper in the domain of reading research. For both Mendel and Stroop religious duties took precedence over scientific self-promotion.

Another quite general impediment is the language of publication. This certainly holds for all seven cases discussed in this paper. All of them were published in German, and none of the relevant publications by Steinthal, Exner, Meringer, Wundt, Reinach, Lipps, or Isserlin were translated into English. With the shift of gravity in the language sciences to the Anglo-Saxon world, especially North-America, during the first half of the 20th century, English became the language of science. Increasingly, the mastery of German was lost in the linguistic community. Secondary English-language sources became the tools of reference to the original sources, often with major misrepresentations or omissions as a consequence. Wundt, for instance, was soon called an "introspectionist" in the United States and often still is, but he wasn't. Wundt never introduced a method of systematically observing and reporting one's own inner experience, thoughts, and feelings. That was done by his students Oswald Külpe in Würzburg, and Edward Titchener at Cornell. It was the latter who ascribed introspectionism to Wundt, whereas Wundt had himself attacked that method in his ferocious 1908 critique of Karl Bühler's Habilitationsschrift (Wundt 1908), which had been supervised by Külpe. As mentioned, the major American source on Wundt's (psycho-)linguistics was Bloomfield's (1914) text, but it left out Wundt's phrase diagrams and didn't mention his grammar of sign language.

One really wicked fairy has been behaviorism, in particular the North-American Watsonian variant of it. This played in linguistics and psychology alike. All above beauties had originated in the minds of mentalists. Still in 1914, the year John Broadus Watson's *Behavior* appeared, Leonard Bloomfield put the common view this way: "To demonstrate in detail the role of language in our mental processes would be to outline the facts of psychology" (56), but then the tide quickly turned in the United States, for reasons that are still not well understood. This is how Bloomfield rejected mentalism in 1933: "It remains for linguists to show, in detail, that the speaker has no 'ideas', and that the noise is sufficient—for the speaker's words to act with a trigger-effect upon the nervous systems of his speechfellows" ([1933] 1976, 93). Although behavioristic language scholars deeply disagreed among themselves, they all outlawed explanation in terms of mental constructs. It even became an industry to translate

traditional notions into "behaviorese," replacing mental linguistic terminology by an "objective" one. Here is just one example, from Skinner (1957, 44–45), Otto Jespersen translated into behaviorese:

Jespersen's text: "In many countries it has been observed that very early a child uses a long *m* (without a vowel) as a sign that it wants something, but we can hardly be right in supposing that the sound is originally meant by children in this sense. They do not use it consciously until they see that grown-up people, on hearing the sound, come up and find out what the child wants." (44; original: Jespersen [1922, 157])
Skinner's translation: "It has been observed that very early a child emits the sound *m* in certain states of deprivation or aversive stimulation, but we can hardly be right in calling the response verbal at this stage. It is conditioned as a verbal operant only when people, upon hearing the sound, come up and supply appropriate reinforcement." (45)

The general disdain for "mentalism" increasingly led to ignorance of the original sources in (psycho-)linguistics.

The most vicious of all fairies was no doubt anti-Semitism and war. By the end of World War I, the Austro-Hungarian Empire had fallen apart. Its formerly booming capital Vienna became the impoverished, top-heavy capital of powerless Austria. The Versailles treaties of 1919 undermined Germany's economy. In both countries science suffered. This triggered the gradual shift of the language sciences' center of gravity to North-America, but the deathblow was dealt by Hitler's National-Socialism. The havoc raised in the language sciences is best documented by Utz Maas (2010). The exodus of Jewish, but also non-Jewish language scholars began right upon Hitler's accession to power on January 31, 1933 and his shortly following April 7 law which compelled universities to dismiss their Jewish members of staff.[13] This amounted to some 20 percent of the total German university faculty. A second wave of exodus immediately followed the Austrian *Anschluß* of March 12, 1938. Many of the great contributors to language science in both countries were Jewish. I reviewed these tragic developments in my book *A History of Psycholinguistics* (2013). What is relevant here is that in quite a number of cases the dismissed scientists had no chance to re-establish their reputation in their new environments. Some died or were killed before the war was over. Among them were phonologist Nikolay Trubetskoy, who suffered a heart attack when the Gestapo entered his home in Vienna for a search; phonetician Elise Richter—the first woman university professor of Austria—, who was murdered in Theresienstadt; psychologist Otto Selz, who died in a freight wagon on the way to Auschwitz. None of all these scientists were given the opportunity to further develop and promote

their intellectual heritage. In one case, the two World Wars joined forces to truncate a promising intellectual development. Both pioneers of speech act theory were killed on the German front: in 1913 young Adolf Reinach in Diksmuide Belgium, and in 1941 Hans Lipps on the Russian front. John Austin could hardly have become aware of their work.

12.9   Prospect

Has modern science successfully banished the wicked fairy? The language barriers have been largely removed, with (bad) English as the generally accepted lingua franca of science. Although dogmatic behaviorism has faded from the scene, other forms of intellectual provincialism have until recently blossomed in linguistics behind impenetrable walls of defense. But this era of "linguistic wars" also belongs to the past it seems. Most importantly, the seven decades since the latest (and hopefully very last) World War has seen a large scale globalization of the scientific enterprise, from which the language sciences are profiting immensely. Language diversity can now, finally, be addressed involving native speakers of all ethnicities and cultures. The beauties on this global academic scene are very much alive and kicking, but let us stay alert. One menacing wicked fairy in modern science is its quasi market model. Frequent publication in high-impact journals has become the sine qua non for a scientific career. Publication rate, especially among the young and untenured, has been rocketing in recent years. Journal papers, especially short and multiple-authored ones, have become the dominant output commodity of science and (psycho-)linguistics. However, a really functioning market matches producers and consumers. That healthy situation does not exist in science as Klein (2012) has argued. Most published papers are hardly ever cited and quite probably hardly ever carefully read. There is no guarantee whatsoever that the best ideas will ultimately emerge in "the market." It seems moreover inevitable that especially risky, non-trivial, and innovative insights will be hard put to survive peer review. In short, new sleeping beauties are bound to be added to the hidden, overgrown castle of science. History will keep repeating itself.

Notes

1. Inevitably, the present paper occasionally uses material from that book.

2. "Glückliche Fortschritte in der Sprachwissenschaft setzen eine entwickelte Psychologie voraus." This and all following translations are mine.

3. "Alles Sprechen und Denken in Worten beruht darauf [. . .] dass der Inhalt seine stellvertretenden Wörter in das Bewusstsein schicke, da er selbst nicht dahin gelangen kann."

4. "Mit ähnlicher, sehr geringer Intensität werden beim Hören, z.B. des Lautes *K*, die Bahnen erregt werden, welche in vielen Fällen gleichzeitig mit der Empfindung des *K* in Action waren und die den Vorstellungen von 'Knabe,' 'Kuh,' 'Kirsche,' 'Kugel,' 'Kern' etc. entsprechen. . . . Diese Erregung verschwindet aber nicht sofort mit dem Aufhören des Lautes *K*, sondern besteht als Bahnung, wie wir gesehen haben, noch eine nach Secunden zählende Zeitdauer fort. . . . Wenn nun während des Bestehens der Bahnung dieser Rindenfasern . . . noch der Laut *I* gehört wird, so werden dadurch aus dem ganzen Bereiche der gebahnten Vorstellungen jene Bahncomplexe einen weiteren Zuschuss an Erregung bekommen, welche assoziativ mit dem Laute *I* verknüpft sind. Es soll dabei nicht gesagt sein, dass nicht auch die Vorstellung Fisch durch den *I*-Laut gehoben wird, indem auch sie mit dem Laute *I* zusammenhängt, aber es leuchtet ein, dass alle Vorstellungen, deren Wortbezeichnung mit *KI* beginnt, einen bedeutenden Vorsprung haben, da sie durch das vorgehende *K* bereits gehoben waren. . . . Es wird also die Vorstellung 'Kirsche' näher dem Erregungswerthe liegen, bei dem sie dem Bewusstsein klar vorschwebt, als die Vorstellung 'Fisch.' Sie wird weiterhin nach dem Prinzip der centralen Hemmung die dunkle Vorstellungen 'Knabe,' 'Kuh,' 'Kugel,' 'Kern' etc. unterdrücken, sie wird aber nicht allein dies thun, da sie mit der Lautfolge 'Ki' noch nicht voll entwickelt ist, vielmehr wird sie . . . noch auf gleicher Erregungsstufe stehen mit den Vorstellungen, welche anderen mit 'Ki' beginnenden Worten angehört, und diese werden gemeinschaftlich die centrale Hemmung erwecken. Reiht sich dann weiterhin der Laut *R* an, so wird der gesammte Erregungsprocess der Rindenbahnen nach demselben Principe noch weiter eingeschränkt, so dass etwa nur mehr die Bahnen, welche der Vorstellung 'Kirsche' und 'Kirche' entsprechen, gebahnt sind; der weitere Laut *Sch* trifft nur mehr eine verhältnissmässig sehr geringe Anzahl von Rindenfasern gebahnt, diese Bahnung aber ist eine intensive und wird mit der Pause, welche nach Vollendung des Wortes eintritt, sich zur vollen Erregung der Vorstellungsbahnen der 'Kirsche' entwicklen können." (Exner 1894, 307–308).

5. " . . . und wer nicht beobachten kann, ist kein Forscher, sondern ein Bücherwurm."

6. "Beim Sprechfehler versagt nur die Aufmerksamkeit, die Machine läuft ohne Wächter, sich selbst überlassen."

7. " . . . *wird beim Versprechen von solchen Lautgesetzen völlig abgesehen.*"

8. "Wieviel klarer sprach die Pythia, als wie sich das Schicksal modernen Freud-Menschen offenbart! Man müßte verzweifeln, wenn dasselbe Schicksal die Menschen nicht auch mit der Psychoanalyse begnadet hätte!"

9. "Der Zweck unseres Sprechens ist stets der, den Willen oder Erkentniss einer Person so zu beeinflussen, wie es dem Sprechenden als wertvoll erscheint."

10. "Vielmehr ist das Befehlen ein Erlebnis eigener Art, ein Tun des Subjektes, dem neben seiner *Spontaneität*, seiner *Intentionalität* und *Fremdpersonalität* die *Vernehmungsbedürftigkeit* wesentlich ist."

11. " . . . das Unvermögen, die Wörter grammatisch zu formen und syntaktisch im Satze zu ordnen."

12. "Dieb gewesen—Schwager auf Posten, gar nichts gemerkt—2 Tage—in den Pregel geschmissen—in Königsberg überhaupt sehr schlecht—nur Marken— nichts zu essen. Mörder später gefunden—aus dem Bett genommen Arbeiter."

13. The law in question is the Law for the Restoration of the Professional Civil Service (Gesetz zur Wiederherstellung des Berufsbeamtentums).

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