Slips of the Tongue

by Victoria A. Fromkin
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They are a good deal more than amusing (or embarrassing) errors of speech. The collection and analysis of such errors provides important clues to how speech is organized in the nervous system

The Reverend William A. Spooner, dean and warden of New College, Oxford, is famous in the English-speaking world as the man who had a special talent for slips of the tongue in which two sounds of an intended utterance are transposed. Although it is not certain that he actually made slips of this type, many "spoonerisms" are legendary. "Work is the curse of the drinking classes," he is alleged to have said when he meant "Drink is the curse of the working classes." Among other well-known spoonerisms are (in an address to a rural audience) "Noble tons of soil" and (in chiding a student) "You have hissed all my mystery lectures. I saw you fight a liar in the back quad; in fact, you have tasted the whole worm." Perhaps the most endearing of these slips is "the queer old dean" for "the dear old queen."

Speech errors have been used in literature by such writers as Rabelais, Shakespeare, Schiller and George Meredith. Nearly 300 years before the transposition speech error became known as a spoonerism, Henry Peacham quotes in *The Compleat Gentleman* a man who said "Sir, I must goe dye a beggar" instead of "I must goe buy a dagger." In recent years humorous bloopers made by radio and television announcers have been published in books and even preserved on records. The general awareness of the regularity of the occurrence of speech errors is shown in a column by Herb Caen in the *San Francisco Chronicle* of March 7, 1972: "The Tuck-Fortner Report [newscasts] is off Channel 2, much to the relief of those who worry about spoonerisms. Oddly enough, it was Mike Tuck who committed the only near miss in the history of the program, introducing Banker Fortney Stark as 'Fartney Stork.' "

In *The Psychopathology of Everyday Life* Sigmund Freud attempted to show that "[such] disturbances of speech may be the result of complicated psychical influences, of elements outside the same word, sentence or sequence of spoken words." In discussing the unconscious forces that he postulated as the cause of speech errors, Freud speculated "whether the mechanisms of this [speech] disturbance cannot also suggest the probable laws of the formation of speech."

Karl Spencer Lashley, a pioneer in neurophysiology, regarded speech as the "window through which the physiologist can view the cerebral life." He regarded speech errors as evidence that behavior can only be accounted for by positing "a series of hierarchies of organization: the order of vocal movements in pronouncing the word, the order of words in the sentence, the order of sentences in the paragraph." Disordering of these hierarchical units, he said, may occur at any stage, which would account for the diversity of observed speech errors.

In spite of the universality of various types of speech error, it was not until the 19th century that scholars began to pay serious attention to such utterances as evidence for psychological and linguistic theories. Hermann Paul, a German philologist, was probably the first linguist to suggest that an examination of speech errors might provide important clues to one cause of language change. Other linguists have been interested in slips of the tongue as a means of finding out what it is we learn and store in our minds when we learn a language.

A person's knowledge of a language cannot be equated solely with the words and sentences he utters and understands. If all the utterances of a person, or a number of persons, were recorded for an hour, a day, a week, a month, a year or even a lifetime, the corpus of these utterances would not in itself constitute the language he speaks. No one book can contain a complete human language. It is highly unlikely that this English sentence will have been printed before: "The Watergate scandal was caused by green-skinned, three-headed, cloven-footed Martians dressed in pink tights who penetrated the top-secret files of the Pentagon." Whether or not it is true, the preceding sentence is a grammatical English sentence that can be understood by any person with a knowledge of the language, yet it could not have been included in an English-language book before I had written it.

What makes it possible for a person to produce and understand novel sentences? If we are to understand the nature of language, we must be able to explain this ability. It cannot be accounted for simply by listing all possible sentences; in principle the number of sentences is infinite. For any sentence of length n one can produce a sentence of length $n + 1$. For example: "This is the house that Jack built. This is the malt that lay in the house that Jack built. It is questionable that this is the malt that lay in the house that Jack built. I know that it is questionable that this is the malt that lay in the house that Jack built."

Given the finite storage capacity of the brain, one cannot store all possible sentences of a language. We can of course store the words of a language because they are finite in number. In no language, however, are sentences formed by putting words together at random. "Built Jack that house the is this" is not an English sentence. Furthermore, although the number of words in a language is finite, the speakers of a language have the ability to create and adopt new words, for example Brillo and Kleenex. But just as there are rules for well-formed sentences, so there are rules for well-formed words; "Glooper" could

be an acceptable word for a new product, but "nga" would never be used in English even though it is a perfectly good word in the Twi language of the Ashanti in western Africa.

Knowledge of a language must therefore include rules for the formation of words and sentences. In order to account for a speaker's ability to form a potentially infinite set of sentences and for his linguistic judgments concerning the well-formedness of words and sentences, linguistic theorists posit that what is learned in language acquisition is a grammar that includes a finite set of basic elements and a finite set of rules for their combination, including a recursive element to allow the formation of sentences of unlimited length [*see illustration on next page*]. Furthermore, there must be a hierarchy of such elements: discrete elements of sound (phonemes) combine in restricted ways to form syllables, which combine to form meaningful units (morphemes or words), which are combined to form phrases, which are combined into sentences [*see top illustration on page 184*].

All attempts to describe language and to account for our linguistic abilities assume the discreteness of each of these linguistic units. Yet the sounds we produce and the sounds we hear when we are talking are continuous signals, and examination of the physical properties of these acoustic signals does not reveal individual discrete sounds, words or phrases [*see bottom illustration on page 5*]. It has been impossible, however, to account for our linguistic abilities without positing a grammar consisting of discrete units and rules. This has always been intuitively accepted, as is indicated by the ancient Hindu myth in which the god Indra is said to have broken speech down into its distinct elements, thereby creating language. The classical Greeks also recognized the difference between the continuous nature of speech and the discrete nature of language. The messenger of the gods, Hermes, is also the god of speech because he was always on the move. In Plato's *Cratylus* dialogue (the oldest extant philosophical essay dealing exclusively with language) one of Hermes' namesakes, Hermogenes, asks Socrates if language can be analyzed by taking it apart. Socrates answers that doing so is the only way one can proceed.

The reality of the discrete elements of language and their rules of combination cannot be found by looking into the brains of speakers. It is here that systematic errors of speech can yield useful evidence.

Looked at from the viewpoint of linguistic behavior or performance, speech can be considered a communication system in which the concept to be conveyed must undergo a number of transformations. The message is generated in the brain of the speaker, encoded into the linguistic form of the language being spoken and transformed into neural signals that are sent to the muscles of the vocal tract, which transform the message into articulatory configurations. The acoustic signal must then be decoded by the listener to recover the original message. Thus the input signal that presumably starts as a string of individual discrete sounds organized into phrases and words ends up as a semicontinuous signal that the receiver must change back into the original string of discrete units. The grammar that represents our knowledge of the language allows us to encode and decode an utterance.

Difficulties are encountered in attempts to model the actual behavior of a speaker because the only phenomena in this communication system that can be examined are the semicontinuous muscular movements of the vocal tract, the dynamic articulatory configurations and the acoustic signals. As in other communication systems, however, noise in any of the stages or connecting channels involved in speech can distort the original message. Most errors of speech would seem to be the result of noise or interference at the stage of linguistic encoding. Such errors can tell us something about a process that is not otherwise observable, and about the abstract grammar that underlies linguistic behavior.

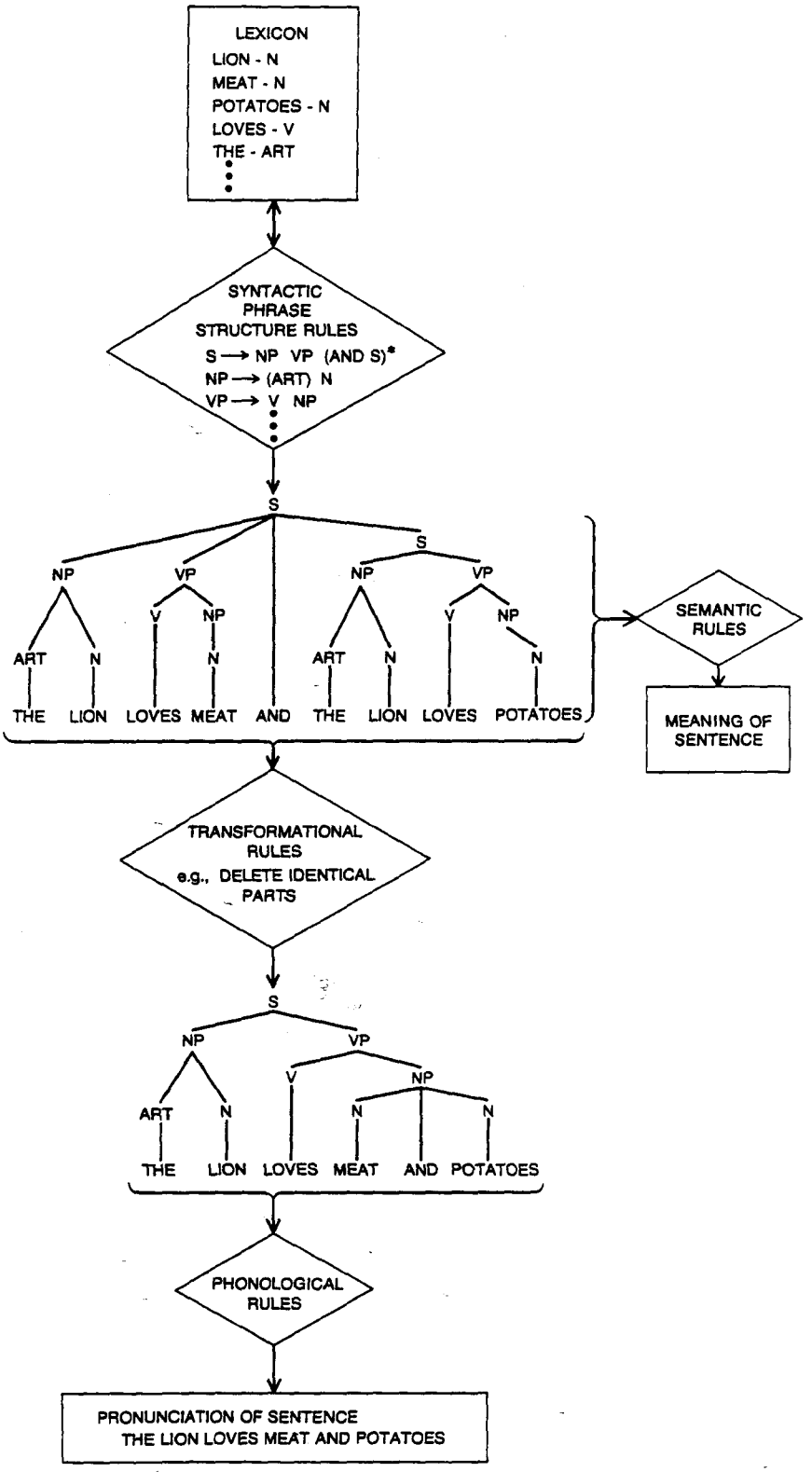
Over the past five years I have re-

WILLIAM A. SPOONER was famous for his reputed lapses of speech, in which he would transpose two or more sounds, for example "blushing crow" for "crushing blow." Such speech errors are now called spoonerisms. This caricature of Spooner is by Sir Leslie Ward, whose work appeared in *Vanity Fair* under the pseudonym of Spy. Spooner was born in 1844 and died in 1930. A clergyman, he served as dean and warden of New College, Oxford.

corded more than 6,000 spontaneous errors of speech. In order to prevent the inclusion of errors of perception each item has been attested to by at least one other person. The deviant utterances that I give as examples hereafter are taken from this corpus.

According to all linguists who have analyzed spontaneous speech errors, the errors are nonrandom and predictable. Although one cannot predict when an error will occur or what the particular error will be, one can predict the kinds of error that will occur. Such predictions are based on our knowledge of the mental grammar utilized by speakers when they produce utterances. For example, many errors involve the abstract, discrete elements of sound we call phonemes. Although we cannot find these elements either in the moving articulators or in the acoustic signal, the fact that we learn to read and write with alphabetic symbols shows that they exist. In addition, if these discrete units were not real units used in speaking, we could not explain speech errors in which such segments must be involved. Substitution of one segment for another occurs: a later phoneme may be anticipated ("taddle tennis" instead of "paddle tennis"); a phoneme may persevere ("I can't cook worth a cam" instead of "I can't cook worth a damn"), or two segments may be transposed ("Yew Nork" instead of "New York"). Such segmental errors can involve vowels as well as consonants ("budbegs" instead of "bedbugs"). Moreover, two consonants that form a cluster can be either split or moved as a unit ("tendahl" instead of "Stendahl" and "foon speeding" instead of "spoon feeding") [*see top illustration on page 185*]. Such errors demonstrate that even though we do not produce discrete elements of sound at the stage of muscular movement in speech, discrete segments do exist at some earlier stage.

It is not the phonetic properties of sounds alone that determine the more abstract representation of phonemes. Sounds such as those represented by the "ch" in "church" and the "j" and "dge" in "judge" are clusters of two consonants on the phonetic level. This is shown by the fact that in the regular tempo of conversation the following two sentences will be pronounced identically by most people: " 'Why choose,' she said" and " 'White shoes,' she said." Yet linguists have posited that in words such as "choose," "church," "chain" and "judge" these phonetic clusters are single phonemes. The fact that the "ch" and "j" sounds in such words are never split in



GRAMMAR OF A LANGUAGE consists of a finite set of basic elements (lexicon) and a finite set of rules for combining the basic elements such as nouns (*N*), verbs (*V*), articles (*ART*) and so forth. In order to generate a sentence (*S*), noun phrases (*NP*) and verb phrases (*VP*) are combined according to syntactic rules. The semantic rules determine whether or not the sentence generated is meaningful. Transformational rules enable a speaker to permute the sentence without altering its meaning. Phonological rules determine how the sentence is articulated. Errors at various stages can result in production of a deviant sentence, for example "The meat loves lion and potatoes" or "The lion loves peat and motatoes."

SENTENCE	[THE WILLOWY LIONESS LOVES THE WIRY LION]
PHRASES	[[THE WILLOWY LIONESS] [LOVES [THE WIRY LION]]] NOUN PHRASE VERB PHRASE NOUN PHRASE
WORDS	[[[THE] [WILLOWY] [LIONESS]] [[LOVES] [[THE] [WIRY] [LION]]]] ARTICLE ADJECTIVE NOUN VERB ARTICLE ADJECTIVE NOUN
MORPHEMES	[[[THE] [WILLOW + Y] [LION + NESS]] [[LOVE + S] [[THE] [WIR + Y] [LION]]]]
PHONEMES	TH + E + W + I + LL + OW + Y + L + I + O + NN + E + SS + L + O + VE + S + TH + E + W + I + R + Y + L + I + O + N

HIERARCHY OF LINGUISTIC ELEMENTS is depicted. A sentence is composed of noun phrases and verb phrases. Phrases are made up of phrases or individual words and words in turn consist of morphemes, the basic units of meaning. Morphemes are made up of discrete elements of sound called phonemes. Spelling of the phonemes does not represent their sounds in a one-to-one fashion.

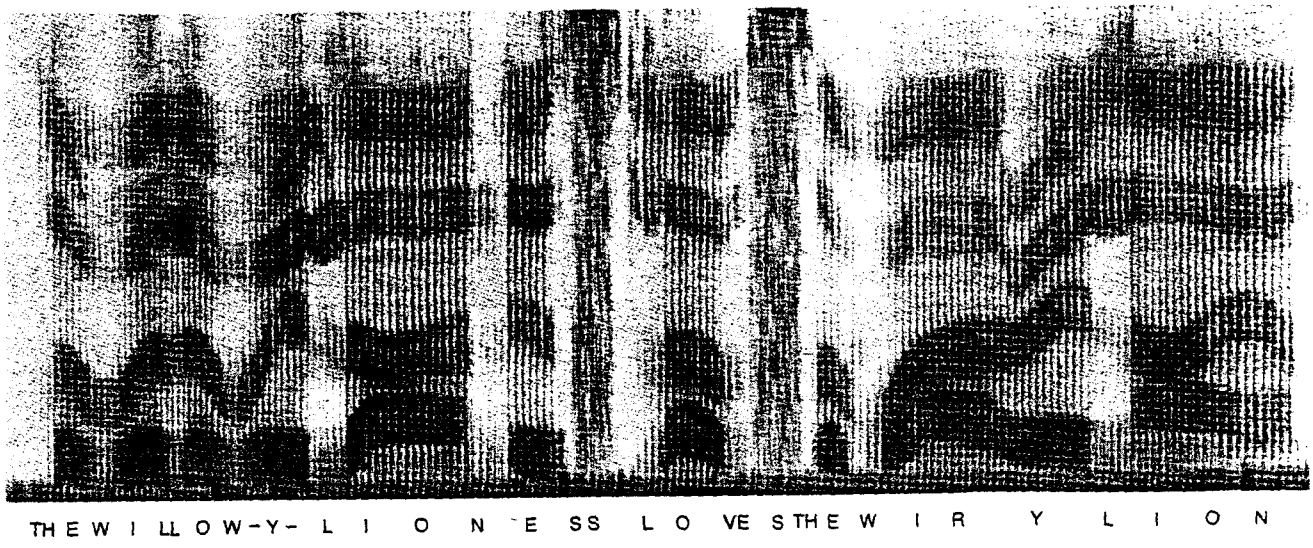
speech errors, although other consonant clusters such as "sp" and "gl" are, bears out this analysis. When these sounds are involved in speech errors, they always move as a single unit, as in "chee cane" instead of "key chain" and "sack's jute" instead of "Jack's suit." In cases where they represent two discrete phonemes, however, they can be independently disordered as in "Put the white boos in the shocks" for "Put the white shoes in the box." Speech errors therefore support the abstract analysis of linguists.

Segmental errors are constrained by rules of grammar that dictate the allowable sequence of sounds. Although "slips of the tongue" can be incorrectly uttered as "stips of the lung," it cannot be uttered as "tlip of the sung" because the sound "tl" is not allowed as the beginning of an English word. It is not the inability to say "tl" that inhibits such errors; we can say it easily enough. Rather it is a grammatical constraint in the English language. It is in this sense that speech errors are predictable and nonrandom.

Phonemic segments have been classified into intersecting sets dependent on shared properties. Thus the sounds that are produced by a closure of the lips, such as /p/, /b/ and /m/ (the diagonals are used to distinguish the sounds from the alphabetic letters), are classified as labials. The sounds produced by raising the tip of the tongue to the top of the teeth, such as /t/, /d/ and /n/, are alveolars. The sounds produced by raising the back of the tongue to the soft palate, such as /k/, /g/ and the /ng/ in "sing," are velars.

Such classes have been used to describe the sounds of all languages, but they had no basis in linguistic theory until recently. Roman Jakobson suggested a set of universal features that could be used to describe the sound system of all languages. These features, somewhat revised, were then incorporated into the theory of generative phonology by Morris Halle, who developed them further in collaboration with Noam Chomsky. It was shown that if segments are not viewed as being composites of features in the grammar of a language, certain regularities would be obscured, and the grammar written by the linguist would fail to correctly model a speaker's linguistic knowledge.

There has been some debate in linguistic circles over whether or not these universal phonetic features have any psychological reality. Some argue that they merely provide an elegant description of the sound system and do not exist as elements in the mental grammar of speakers. Just as speech errors show that discrete segments are real units, so also do they attest to the reality of phonetic features. Among the features posited in the universal set are the binary-valued features: voiced/voiceless and nasal/oral. Sounds produced with vocal-cord vibrations are voiced; sounds produced with an open glottis are voiceless. Nasal sounds are produced by lowering the soft palate to allow some air to escape through the nose while making a sound; oral sounds are produced by raising the soft palate to block off the nasal passage. In speech errors a single feature can be



SOUND SPECTROGRAM of the utterance "The willowy lioness loves the wiry lion" shows the speech sounds as a series of bands with the lowest sound frequencies at bottom and the highest frequencies at top. Note that the acoustical signal is semicontinuous.

disordered while all other features remain as intended; for example, "clear blue sky" was transposed to "glear plue sky." There was a voicing switch: the voiceless velar /k/ became a voiced /g/ and the voiced labial /b/ became a voiceless /p/ [*see bottom illustration at left*].

Unless the individual features have an independent existence in the mental grammar such errors cannot be accounted for. Prior to or simultaneous with the stage in the production process when neural signals are sent to the appropriate muscles, the specifications for voicing or not voicing must have been disordered. Similar transpositions can occur with nasal/oral features.

Speech errors involve more than sound units. In all languages different meanings are expressed by different strings of phonemes. That is, knowing a language enables one to associate certain sounds with certain meanings. One learns the vocabulary of the meaningful units of a language by learning not only the sounds but also what the sounds mean. Since the words of a language can consist of more than one meaningful element, words themselves cannot be the most elemental units of meaning. "Tolerant," "sane," "active" and "direct" are all English words; so are "intolerant," "insane," "inactive" and "indirect." The latter set includes the meanings of the former plus the meaningful unit "in-," which in these instances means "not."

In learning a language we learn these basic meaningful elements called morphemes and how to combine them into words. Speech errors show that there can be a breakdown in the application of the rules of word formation. The result is an uttered word that is possible but nonexistent. For example, "groupment" was said instead of "grouping," "intervenient" for "intervening," "motionly" for "motionless," "ambigual" for "ambiguous" and "bloodent" for "bloody." It is clear from such examples that rules for word formation must exist; otherwise there is no way to explain the deviant word forms. Obviously we do not have such words stored in our mental dictionary. Speech errors suggest that we learn morphemes as separate items and the rules for their combination. This ability enables us to create new words.

Many morphemes have alternative pronunciations depending on their context. The indefinite-article morpheme in English is either "a" or "an" depending on the initial sound of the word that follows: a coat, a man, an orange coat, an old man. This rule of language depends

ERRORS	EXAMPLES	
CONSONANT ERRORS		
ANTICIPATION	A READING LIST	A LEADING LIST
	IT'S A REAL MYSTERY	IT'S A MEAL MYSTERY
PERSEVERATION	PULLED A TANTRUM	PULLED A PANTRUM
	AT THE BEGINNING OF THE TURN	AT THE BEGINNING OF THE BURN
REVERSALS (SPOONERISMS)	LEFT HEMISPHERE	HEFT LEMISPHERE
	A TWO-PEN SET	A TWO-SEN PET
VOWEL ERRORS		
REVERSALS	FEET MOVING	FUTE MEEVING
	FILL THE POOL	FOOL THE PILL
OTHER ERRORS		
ADDITION	THE OPTIMAL NUMBER	THE MOPTIMAL NUMBER
MOVEMENT	ICE CREAM	KISE REAM
DELETION	CHRYSANTHEMUM PLANTS	CHRYSANTHEMUM P ANTS
CONSONANT CLUSTERS SPLIT OR MOVED	SPEECH PRODUCTION	PEACH SEDUCTION
	DAMAGE CLAIM	CLAMMAGE DAME

SEGMENTAL ERRORS IN SPEECH can involve vowels as well as consonants. Some typical types of substitution of sounds are shown. Such errors provide evidence that the discrete phonetic segments posited by linguistic theory exist in the mental grammar of the speaker.

	VOICED ORAL	VOICED NASAL	VOICELESS ORAL
LABIALS	BAT	MAT	PAT
	TAB	TAM	TAP
	BEAT	MEAT	PEET
	BEST	MESSED	PEST
	LIB	LIMB	LIP
	CAB	CAM	CAP
	AMBLE	AMBLE	AMPLE
ALVEOLARS	DIP	NIP	TIP
	CAD	CAN	CAT
	CANDOR	CANNER	CANTOR
	DOLE	KNOLL	TOLL
	DOOR	NOR	TORE
	RAID	RAIN	RATE
	RIDE	RHINE	RIGHT
VELARS	GIRL	*	CURL
	GREASE	*	CREASE
	GUARD	*	CARD
	LUG	LUNG	LUCK
	SAG	SANG	SACK
	ANGLE	ANGLE	ANKLE
	FINGER	SINGER	SINKER

LANGUAGE SOUNDS are categorized by certain universal features such as voiced/voiceless and nasal/oral. Some examples of voiced, oral, nasal and voiceless sounds are shown here. In speech errors a single feature may be disordered while the other features remain as intended. For example, when a person says "cedars of Lemadon" instead of "cedars of Lebanon," the nasality features of the /b/ and the /n/ are reversed. The intended oral labial /b/ becomes a nasal labial /m/ and the intended nasal alveolar /n/ becomes an oral alveolar /d/. Such reversal suggests that these features must also exist in mental grammars.

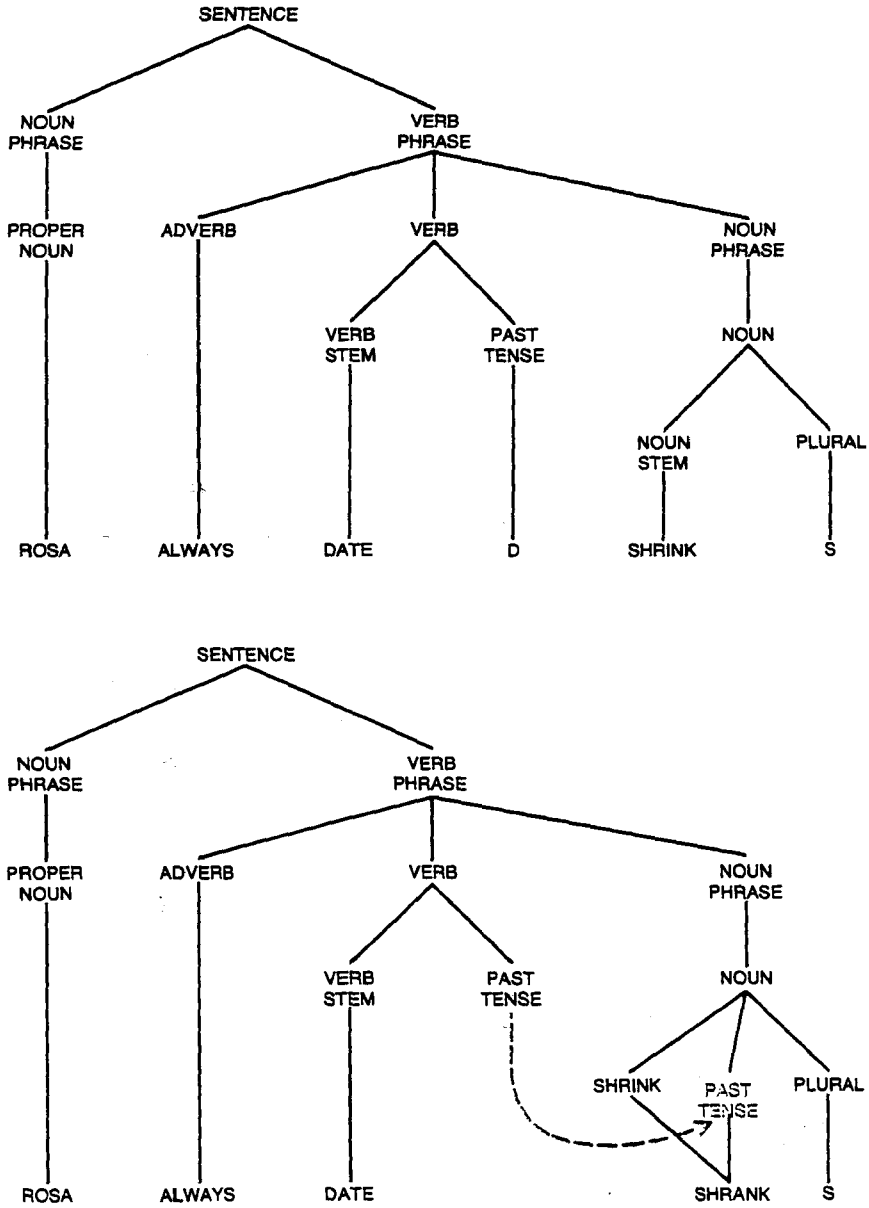
on the morpheme and not on the sound. We do make the "a" sound before a vowel ("America is") and the "an" sound before a consonant ("Roman court"). But errors such as "an istem" for "a system" or "a burly bird" for "an early bird" show that when segmental disordering occurs that changes a noun beginning with a consonant to a noun beginning with a vowel, or vice versa, the indefinite article is also changed so that it conforms to the grammatical rule. The rule also operates when entire words are disordered, as when "an example of courage" was produced as "a courage of example."

This operation is accomplished automatically, and such errors tell us something about the ordering of events in the brain. The disordering of the words or the phonemic segments must occur before the indefinite article is specified, or alternatively the rule that determines the indefinite article must reapply or feed back after the disordering has occurred. Furthermore, the monitoring function of the grammatical rule must specify the sounds of the indefinite article prior to the stage where neural signals are sent to the vocal muscles, since the rule does not change a structure such as "Rosa is" to "Rosan is." The existence of similar rules, called morphophonemic rules, and the ordering of their application are shown over and over again in speech errors.

The errors I have cited show that when we speak, words are structured into larger syntactic phrases that are stored in a kind of buffer memory before segments or features or words are disordered. This storage must occur prior to the articulatory stage. We do not select one word from our mental dictionary and say it, then select another word and say it. We organize an entire phrase and in many cases an entire sentence. This process can be demonstrated by the examination of errors in disordered phrases and sentences: "Nerve of a vergeous breakdown" instead of "Verge of a nervous breakdown"; "Seymour sliced the knife with a salami" instead of "Seymour sliced the salami with a knife"; "He threw the window through the clock" instead of "He threw the clock through the window"; "I broke the whistle on my crotch" instead of "I broke the crystal on my watch."

If these phrases had not been formed in some buffer storage, the transpositions could not have occurred. Furthermore, the intonation contour (stressed syllables and variations in pitch) of the utterance often remains the same as it is in the intended phrase even when the words are disordered. In the intended utterance "Seymour sliced the salami with a knife" the highest pitch would be on "knife." In the disordered sentence the highest pitch occurred on the second syllable of "salami." The pitch rise is determined by the grammatical structure of the utterance. It must be constructed prior to articulation and is dependent on the syntactic structure rather than on the individual words. Thus syntactic structures also are shown to be units in linguistic behavior.

When words are exchanged, they are usually exchanged with words of the same grammatical category; nouns are exchanged with nouns, adjectives with adjectives and so on. This phenomenon shows that words are represented in memory along with their grammatical characteristics. Indeed, when different grammatical classes are involved in a speech error, there is often a restructuring of the words to correct what otherwise would be syntactically incorrect. "I think it is reasonable to measure with care" was not transformed into "I think it is care to measure with reasonable" but rather into "I think it is careful to measure with reason." Such corrections



DISORDERING OF SYNTACTIC ELEMENTS can result in transformation of a sentence such as "Rosa always dated shrinks" into "Rosa always date shranks." The syntactical hierarchical structure of the intended sentence is shown in the top diagram. The error seems to have been caused by a disordering of the past-tense element, which mistakenly became attached to the noun node, as the bottom diagram illustrates. The shift probably occurred because "shrink" is a verb as well as a noun. After the disordering the phonological rules produced "shrank" and since the plural element was not disordered, "shranks" resulted.

reveal that there is constant monitoring at different stages of the speech-production chain. Although some errors emerged, a compounding of errors does not usually occur. In speech errors we never find a total disruption of the permissible syntactic structure, such as "Breakdown nervous a of verge."

But syntactic rules can be broken or misapplied, and syntactic elements can be disordered. Misstatements such as "If he swimmed in the pool nude" and "The last I knowed about it" indicate that words are stored in a basic form. To produce a past tense we do not select a stored past-tense form of a word but apply the rule of past-tense formation to the elemental morpheme. The regular rule for past-tense formation must have been wrongly applied to produce "swimmed" and "knowed." In these two instances the mistakes recorded were made by university professors who do not regularly say "swimmed" or "knowed." The reality of such rules is also shown by the forms produced by children before they have learned that there are exceptions to the rules they have generalized. Children regularly say "swimmed," "knowed," "bringed" and "singed" even though they have never heard these words spoken. Language acquisition involves constructing rules rather than merely imitating what one hears. It is these rules that may be wrongly applied in speech errors [*see illustration on preceding page*].

The negation element in sentences is another example of mistaken rule application: "I regard this as imprecise" came out "I disregard this as precise." The error shows that in producing a negative sentence a speaker must generate an abstract negative element that is ordered in the string according to the rules of the language. The negative element in this sentence is independent of the particular words and can be disordered just as other units can be disordered. The sentence also shows that phonologically the negative element must be determined after the structure of the sentence is imposed. Only then can the negative plus "regard" be realized as either "do not regard" or as "disregard." A model of linguistic performance cannot posit a chain process of word selection; a hierarchical order exists.

Speech errors can involve entire words. A common type of error is a blend of two words: "shrig soufflé" for "shrimp and egg soufflé," "prodeption of speech" for "production and perception of speech." A more interesting blend, called a portmanteau word by Lewis Carroll, combines two words with similar meanings into one: "instantaneous" and "momentary" into "momentaneous," "splinters" and "blisters" into "splisters," "shifting" and "switching" into "swifting" and "edited" and "annotated" into "editated." This type of error reveals that the idea of the message is generated independently of the particular words selected from the mental dictionary to represent these concepts. A speaker seems to match the semantic features of words with the semantic notion to be conveyed. When there are alternatives, synonyms or near-synonyms, the speaker may be unsure of what word will best express his thoughts and in the moment of indecision may select two words and blend them.

The involuntary substitution of one word for the intended word shows that the meaning of a word is not an indissoluble whole. The semantic representation of a word is a composite of hierarchically ordered semantic features. In word selection one finds that the substituted and the original word often fall into the same semantic class: "blond eyes" for "blond hair," "bridge of the neck" for "bridge of the nose," "When my tongues bled" for "When my gums bled," "my boss's husband" for "my boss's wife" and "There's a small Chinese—I mean Japanese—restaurant."

Some errors show that antonyms are substituted: "like" for "hate," "big" for "small," "open" for "shut" and "hot" for "cold." Whatever the psychological causes of such slips, they show the ways we represent language in our stored mental grammar. The person who substituted "dachshund" for "Volkswagen" apparently selected a word with the semantic features "small, German." In the selection he underspecified the features to be matched.

There are many other varieties of speech error. All of them must be accounted for in a model of speech production. By positing the same units and rules required in a linguistic grammar, many of the errors can be categorized and explained. Speech therefore does provide a window into the cerebral life. By carefully studying speech errors we can get a view of the discrete elements of language and can see the grammatical rules at work. We also can look into the mental dictionary and get some notion of the complexity of the specifications of words and how the dictionary is organized. Throughout history men have speculated, theorized and conjectured about the nature of human language. Speech errors provide good data for testing some of these theories.