

Hesitation and the Production of Verbal Paraphasias and Neologisms in Jargon Aphasia

BRIAN BUTTERWORTH

University of Cambridge

Techniques of hesitation analysis taken from studies of normal speakers were applied to the speech of a jargon aphasic. Neologisms were found to follow pauses indicating a word-finding difficulty. Other language functions—phonology, morphology, and syntax—appeared unimpaired, and further analyses of the linguistic and temporal characteristics indicated a single functional disorder in which there is a failure in the mechanisms which associate word-sounds with word-meanings. The patient strategically adapts to this functional impairment by substituting a neologism when lexical search fails. The source of a large class of neologisms, it is hypothesized, is a device which quasirandomly combines English phonemes in a phonotactically regular way. The implications for recovery patterns in jargon aphasia are discussed; and the implications of this case for models of normal language production are explored.

INTRODUCTION

In spite of the widely held belief that cases of pathological language breakdown will illuminate the nature of the language production mechanisms of intact speakers, few investigators have used the methods em-

I would like to thank Sir Roger Bannister and the Department of Psychology at the National Hospital for Nervous Diseases, Queen Square, London, who allowed me to use their videotape of the patient K. C. to do these analyses, and in particular to Mr. J. Stevenson who carried out the psychological testing and supervised the interview. I am grateful to Drs. Warrington and Shallice of the National Hospital and to Professor O. L. Zangwill and Malcolm Piercy for helpful comments and advice on a draft of the first part of this paper. Mr. Ted Harding, Professor D. Kendall, and their colleagues in the Mathematics Department at Cambridge generously used their code-breaking skills to gloss the test and many items now in the "Target-Related Category" would have been misclassified without their help. Finally, I would like to thank the speech therapists, linguists, and psychologists who attend our weekly Psycholinguistics Seminar for many stimulating sessions on matters of aphasiology.

A shorter version of this paper was presented to the Experimental Psychology Society in March 1977 at Sheffield. I am grateful to that audience for some useful comments.

Requests for reprints should be sent to Dr. Brian Butterworth, University of Cambridge, The Psychological Laboratory, Downing Street, Cambridge, CB2 3EB, England.

ployed by students of normal language production mechanisms to examine aphasic patients. In this paper, hesitation analyses are used to evaluate two explanations of the jargon aphasia syndrome current in the literature.

In Part 1, it is shown that neologisms tend to follow pauses. These data count against a disinhibition explanation of the syndrome, and indicate a word-finding problem.

In Part 2, an analysis of the phonology, morphology, and syntax of the speech indicates that these functions are intact. The phonological characteristics of the neologisms, taken together with a more detailed pause analysis, can be explained in terms of a strategic adaptation to the impairment of the mechanism that associates word-meanings with word-sounds. Essentially, when the search for the phonological form of a word fails, the patient substitutes a neologism. Neologisms preceded by a relatively brief delay are phonologically similar to real words, and appear to be distortions of them. However, the largest class of neologisms seem to be similar to other neologisms but not to real words, and these are preceded by a longer pause. It is argued, from the phonological characteristics of this class, that a special "device" is responsible for their generation.

These data have implications for the organization of language production in normal speakers: The autonomy of lexical search is supported in that this process can be specifically impaired leaving other aspects of the production system working more or less normally. Apparent deviations in syntax are accountable in terms of the selection of inappropriate lexical items.

PART 1

1. The Syndrome

As is well-known from the aphasiological literature, the following symptoms are frequently found in close association: impairment of comprehension, fluent or superfluent speech containing verbal or literal paraphasias, circumlocutions, and neologisms. Typically, though not invariably, syntactic organization and prosody are unaffected. This set of symptoms results in speech which is, more or less, unintelligible, and was given the name "jargon aphasia" by Alajouanine, Sabouraud, and Ribaucourt (1952) but had been previously identified and discussed by nineteenth century neurologists, including Jackson (1958) and Wernicke (1874), who noted that its appearance was associated with damage to the posterior speech areas.

Considerable variation in the severity of the component impairments had been reported. Most patients, but not all, are unable to detect neologisms in their own speech or in the speech of others and many deny having any speech defect (Weinstein, Lyerly, Cole, & Ozer, 1966). Com-

prehension may be almost nonexistent or just mildly disturbed; and the production of neologisms and verbal paraphasias may constitute the best part of the speech output, or a smaller proportion, or, apparently, may be confined to talk on particular topics, most notably the patient's own disabilities (Weinstein et al., 1966; Kinsbourne & Warrington, 1963).

There would appear to be variation in the fluency of the speech, though this has not been presented quantitatively. Qualitative, clinical descriptions range from "fluent" to "abnormal talkativeness" to "logorrhea" (see, for example, Pick, 1931; Brown, 1972). Howes (1964) measured the speech rate of 80 aphasic patients, a substantial proportion of whom seemed to be of the posterior kind (his "Type B"), and he reports only two or three of these as having a speech rate faster than the mean for controls.

2. The "Disinhibition" Explanation

One kind of explanation widely advanced for this phenomenon involves the notion that speech pours forth uncorrected and uninhibited by other functions; the production mechanism, if you will, is started up and then operates unchecked. Kinsbourne and Warrington write, "The speech of jargon aphasics is of particular interest in the study of aphasia, as its copious flow, uninterrupted by hesitation and correction, suggests that it can be regarded as a 'first attempt' at expression, and thus reflecting more closely than the other varieties of aphasia the condition of the patient's inner speech" (1963, p. 27).

Alajouanine takes a similar line: "In jargon aphasia, logorrhea, quick utterance, uncontrolled expression show indisputably the lack of voluntary influence" (1976, p. 27). Zangwill's review of more recent evidence led him to conclusions very similar to Wernicke's: "Although disturbances of aural comprehension are not invariably present, paraphasia would appear to depend on a defect of high-grade aural control of expressive speech" (1960, p. 1717). It has even been argued by Rochford (1974) that jargon aphasics are not really aphasic at all, since they have no language loss, as such, rather a superfluity of the wrong kind of verbal response, which they cannot initially suppress.

A considerably more detailed disinhibition account had been given some 30 years earlier by Pick. In Chapter 6 of *Aphasia* (1931), he defines six stages of processing between a thought and its verbal expression. The consequences of failures of inhibition are outlined in Chapter 10: "The explanation of the disorders of disinhibition is based upon the differentiation of their effects into *confusion of words* and *distortion of words*, which makes it a priori probable that this distinction is due to the onset of the disturbance at different stages in the speech process" (p. 56). "In verbal paraphasias, confusions of words, the word determined by thoughts and by the sentence pattern formulated at a priori stage in the process is

inwardly present . . . but this normally rigid determination is loosened up" (p. 58). Literal paraphasias result from the disinhibition of the unintended parts of the intact sound-sequencing mechanisms. The pattern of errors in jargon cases is thus a combination of these effects—inappropriate words plus distortions of both correct and inappropriate words.

3. *The "Anomia" Explanation*

Pick adds, however, an interesting rider, based on the pattern of recovery. Jargon aphasia, he claims is the result of the "combination of paraphasic and amnesic phenomena"; thus, "the paraphasic component leads to a return of the amnesic" (p. 58), where neologisms disappear and silent gaps in output remain, since, in some unexplained way, the intention to the correct word regains (some of) its power to inhibit incorrect words.

Many other authors have reported similar recovery patterns. Among these, Buckingham and Kertesz (1976) have suggested that jargon aphasics are anomic.

Other lines of evidence also point to an anomic condition. Confrontation-naming tests invariably elicit poor performance from jargon aphasics (Kinsbourne & Warrington, 1963; Kertesz & Benson, 1970; Brown, 1972; etc); though disinhibition theorists, in particular Rochford (1974), have maintained that this might be due, not to the unavailability of the right word, but to the inability of the patient to suppress the wrong responses.

There are, however, lines of evidence pointing to a genuine anomia. Howes (1964) reports a greater reliance on a smaller number of words in spontaneous conversation from all his aphasic subjects, as compared with normal controls. The jargon aphasics in his sample (see Howes & Geschwind, 1964) show a pattern of shifting to the use of higher frequency words. Only three patients even come within his normal range of word-frequency usage and they are described as "nearly perfectly recovered." Newcombe, Oldfield, and Wingfield (1965) examined object-naming latency with respect to word frequency. They do not present a classification of the kind of aphasic disorder, but they report no aphasic subject with normal, or better than normal, latencies for infrequent names, though for very frequent names the performance of aphasics and controls is identical.

4. *Hesitation Analysis*

It is known from the literature on speech production in normal populations, that the amount and location of silence in speech is a reliable indicator of the kinds of underlying process which the speaker is engaging (Goldman-Eisler, 1968; Butterworth, 1972, 1975, in press,a). In particular,

it can be determined that many pauses are associated with the word-selection process; items which are improbable in context, and presumably therefore less available, tend to require for accessing from storage in a mental lexicon a measurable delay in output (Goldman-Eisler, 1968; Tannenbaum, Williams, & Hillier, 1965; Butterworth, 1972, in press,a).

5. Predictions

It would be of interest, then, to see whether, in jargon aphasia, the speaker merely says "the first thing that comes into his head," or whether, on the contrary, either verbal paraphasias or neologisms show some systematic relation to the occurrence of hesitations. A disinhibition (without anomia) explanation would surely predict that errors will occur at those points in the speech output where the next word is readily available, that is, in the middle of fluent passages. The anomic, or amnesic, explanation—though inadequate by itself, since it cannot explain why neologisms occur—would predict that errors will occur just at those points where the appropriate lexical item is unavailable, that is, immediately following a pause, where a lexical search, in this case unsuccessful, has taken place. It would also predict, bearing in mind data from Howes and Newcombe et al. (1965), that such occurrences would be associated primarily with searches for infrequent items, namely, those from the "open" word classes: nouns, verbs, and adjectives.

Method

1. Clinical Report

K.C., a patient under the care of Sir Roger Bannister, at the National Hospital for Nervous Diseases, London, was a 72-year-old retired solicitor with no history of previous neurological disease. He collapsed in his garden; a few minutes later there were signs of slight weakness and a very severe speech disturbance. The weakness rapidly resolved, but the language disturbance persisted; his speech was fluent but full of neologisms and other jargon. There was a suggestion of visual inattention toward the right although this was inconsistent. The right side of the face moved more slowly than the left but otherwise the cranial nerves were normal. In the limbs there was no weakness demonstrable, although the right hand was rather slower and more clumsy than the left. On the sensory side there was no definite abnormality although again there was a suggestion of inattention toward the right. He obeyed some commands presumably making use of the nonlinguistic information available in the context, but on the whole appeared unable to comprehend speech. Psychological testing could not be carried out in full because of the communication difficulty. He performed, however, at the superior level on WAIS Block Design which is a strong counterindication to any possibility of dementia.

He was unable to name objects, or to read or write spontaneously, but he could copy individual letters. Skull X ray and isotope scan were normal. A diagnosis of left hemisphere vascular occlusive lesion was made.

2. Procedure

The interview was conducted 2 months after his stroke, during the course of which an object-naming test was administered. The interview was videotaped, and lasted 24 min.

Analysis

1. Identification of Verbal Paraphasias and Neologisms

From the videotape record, a transcript was prepared and checked against the tape several times. Verbal paraphasias (wrong words) were counted if the item was an English word which was semantically quite inappropriate, and of the wrong syntactical class in its context (failure of concord or other inappropriate morphology did not count). Neologisms were counted if the item was not an English word. This category would contain items which some authors would regard as literal paraphasias, such that the substitution of one (or two?) phonemes would make the item an English word; similarly, some authors would categorize certain of the verbal paraphasias as literal, if by phoneme substitution the appropriate target word would be constructed. Categorizing an item as a literal or verbal paraphasia requires a hypothesis about the intended target; since the identification of the target was extremely difficult in this case, a conservative policy was adopted, counting possible literal paraphasias as verbal paraphasias if the item sounded like a real word. Even so, there was an additional problem: Certain items classified as verbal paraphasias might have been neologistic constructions that just happened to sound like regular English words, and would be more correctly described as "jargon homophones" of English words; in the following examples, IPA symbols in square brackets indicate items classed as neologisms; underlined items were classed as verbal paraphasias:

*I've got to plied up. I've got to plied again.
I would [ɪntərm] league er barrack stuff then.*

2. Identification of Clause Boundaries

Clauses were defined as surface constituents containing a main verb, or in a few instances constituents which clearly indicated an elliptical main verb, either in an accepted way or by aphasic omission, or in the event of a verbal paraphasia, as in "Ooh, I didn't late before."

Results

K.C. produced a total of 2230 words (including neologisms), in 20 min, 16.65 sec of holding the floor, which is a speech rate of 109 words per

minute, and well within Howes' (1964) normal range. The proportion of silence to total floor-holding time (phonation plus silence) was also not significantly different from normal speakers in broadly comparable tasks (see Table 1) as measured in Butterworth (1972) and Shallice and Butterworth (1977). Partitioning the interview into conversational sections and object-naming sections (K.C. spoke a mean of 37 sec for each answer), object naming, though still within the normal range at 34.9% silence, was less fluent than the conversational sections (26.5 to 30%).

1. Syntax

As can be seen from Table 1, measures 2 and 3, the distribution of pauses with respect to syntactical boundaries was indistinguishable from the normal samples.

2. Neologisms and Verbal Paraphasias

A word was counted as "hesitant" if it was immediately preceded by a pause of 250 msec or greater. This criterion eliminates silences created by articulation alone, as for example in a transition between two stop consonants (cp. Goldman-Eisler, 1958). A word was also counted as hesitant if there was a hesitant function word, which was part of the same immediate constituent, immediately preceding it; in which case the function word would be excluded from the analysis. For example ("#" indicates a pause greater than 250 msec),

TABLE 1
DISTRIBUTION OF PAUSES IN K.C. AND NORMAL SPEAKERS

	K.C.	Butterworth (1972)	Shallice and Butterworth (1977)
Overall percentage of pausing	29.09	36.00 ^a SD 9.4	37.4 ^b SD 4.4
Percentage of pauses at grammatical junctures	44.6	39-60	
Percentage of grammatical junctures marked by a pause	61.5	49-64	
High level amendments (rate per 1000 words)	8.5	Butterworth and Shallice (1977) ^b	
		Global aphasic 66.1	Normal controls 4.9

^a Conversational argument: $N = 8$.

^b Description of holiday: $N = 10$.

I used to known them all # in [zæklənd]

[zæklənd] would be counted as hesitant and "in" would be excluded; whereas in

I've not [nɔtər] with the [vɜrkər],

neither [nɔtər] nor [vɜrkər] was counted as hesitant. (A justification for "promoting" words into the hesitant category can be found in Butterworth, in press,a). The same kind of procedure was applied to verbal paraphasias.

Three analytic presentations of data were employed (see Table 2). First, the distribution of hesitant vs fluent neologisms was compared with the distribution of hesitant vs fluent nonneologized items. Second, neologisms and nonneologisms which initiated clauses were compared; and third, an analysis restricted to items which are not clause initial. Clause initial neologistic items were either those which actually came in the first position, or those in the first immediate constituent but preceded by just one function word; e.g., (*and*) *was* [plezd] *to see the other* [dɔkumən]. This adjustment for syntactical position is clearly necessary, since 44.6% of all pauses occur at clause boundaries, and therefore distribution of hesitations with respect to neologisms might have been simply a function of their clause position.

A χ^2 test was used to determine whether the distribution of frequencies in the categories was different. Neologisms turned out to be significantly more likely than real words to follow hesitations, taken overall, or taken only at nonclause-initial positions (Table 2, Measures 1 and 3).

Verbal paraphasias, however, are significantly less likely than neologisms to follow pauses (Table 2, Measure 4).

3. *Hesitations and Form-Class in Words and Neologisms*

The grammatical class of the majority of the neologisms could be determined from the neighboring linguistic context (for procedure, see Part 2, Analysis, Section 1). Of these, 61% were nouns. It was thus possible to compare the relative hesitancy of real nouns and noun neologisms. About half the noun neologisms were preceded by a pause (44 out of 84), whereas less than one-quarter of the real nouns were (36 out of 165). A χ^2 test showed these distributions to be different at the $p < .001$ level. It should also be noted that a striking proportion of the real nouns were very common and very general in meaning. There were 22 occurrences of the word thing(s), for example, and the eight most common nouns accounted for 36% of all real noun tokens (thing(s), year(s), week(s), sort(s), people, bit, brother(s), gentlemen).

4. *Self-Corrections and Other Hesitation Phenomena*

A characteristic of normal conversation speech is the presence of false starts, where the speaker begins (a clause, typically) in an apparently

TABLE 2
DISTRIBUTION OF PAUSES IN RELATION TO WORDS,
NEOLOGISMS, AND VERBAL PARAPHASIAS

		Hesitant ^a	Fluent	Total
(1) All words	Neologisms	83	81	164
	Nonneologisms	366	1700	2066
		449	1781	2230
		$(\chi^2 (1) = 100.2, p < .001)$		
(2) Clause starts only	Neologisms	12	2	14
	Nonneologisms	180	93	273
		192	95	287
		$(\chi^2 (1) = 1.54, p < .20)$		
(3) Words except clause starts	Neologisms	71	79	150
	Nonneologisms	186	1607	1793
		257	1686	1943
		$(\chi^2 (1) = 12.47, p < .001)$		
(4)	Verbal paraphasias	9	26	35
	Neologisms	71	79	150
		80	105	185
		$(\chi^2 (1) = 4.56, p < .05)$		

^a Items immediately preceded by a pause, including "promotions" (see text).

quite acceptable manner, abandons that clause in midstream, and restarts usually from the beginning of the last constituent. These are variously titled in the literature: "false starts" (Maclay & Osgood, 1959), "high level amendments" (Shallice & Butterworth, 1977). The latter authors also provide normative data from a control group of nonaphasic subjects and comparative rates for a patient with severe aphasic difficulties (see Table 1).

High level amendments (HLAs) are to be distinguished from "repeats," where the speaker begins a grammatical constituent, and then begins it again repeating all the previous items. In the case of K.C., care had to be taken to ensure that these categories were not confused with the aphasic characteristics of his speech. Since prosody was unaffected, all candidate HLAs and repeats were checked with the intonational patterns obtaining at that point. It is then quite straightforward to distinguish intonational continuation from intonational patterns indicating that a correction or repeat is being made. The untrained listener has no trouble in doing this, and, indeed, would find it very hard to recover from memory that a correction or repeat has been made. The intonation for repeats generally involves simply repeating the intonation pattern. With corrections the basic pattern is frequently marked by some contrasting device on the "head" (or "nucleus," according to position in the tone group) like raising the head, and restarting on a noticeably higher pitch.

Examples of HLA

- (1) *I've done one or two things with that—with my brother*
- (2) *Than I had to get—I then had to get*
- (3) *the [lækkl]—the General [eksli]*
- (4) *Then I have a lot of [dik]—er # [grud]*

Examples of an apparent HLA where intonation indicates a continuation

- (5) *I wait for ten # three weeks*

Example of a repeat

- (6) *And just lately for the—for the lot*

In all, K.C. produced 17 HLAs (about 8.5 per 1000 words), of which 3 were in the immediate vicinity of a neologism and 5 repeats.

Discussion

One must proceed with caution in trying to establish hesitation norms across subjects, since situational factors, affiliation, and mood are known to affect hesitation rates (see Rochester, 1973, for a review). And, though not always unconnected with those factors, the originality and cognitive complexity required by the speaking task—especially the topic—can have a striking effect on the overall proportion of silence (Goldman-Eisler, 1961; Butterworth, 1972) and on the patterning of these pauses (Butterworth, 1975; O'Connell, Kowal, & Hörmann, 1969). There is, as well, some reason to suppose that the speaker has a degree of discretion in setting his own level of originality and complexity, so the bare description of the task is not necessarily a guarantee that this is the task the speaker has set himself. Nevertheless, the literature is in fairly broad agreement on, for example, the range of values for the proportion of silence in naturalistic conversations on a wide variety of topics.

At the very least, therefore, there are no grounds, from these data, for supposing that K.C.'s speech is importantly different from normal subjects' on similar tasks with respect to either the overall proportion of silence, speech rate, or the distribution of pauses in relation to clause junctures. The rate of corrections, HLAs, is also comparable to, even slightly higher than, the rate found for a normal control group (Shallice & Butterworth, 1977)—4.9 per 1000 words as compared to K.C.'s 8.5 per 1000 words. These authors also found a rate of 66.1 per 1000 words for a severe expressive aphasic; so this measure has some sensitivity. (Howes and Geschwind (1961) have found that the repetition rates for jargon aphasics were similar to normals).

In other respects, K.C. responds to the usual clinical picture of jargon aphasia: Syntax is not error free, but recognizably English, intonation is preserved, and the rate of neologisms and verbal paraphasias (164 and 35 in 2230 words of speech) striking, though not as severe as in many reported cases; comprehension is severely impaired, and there is little

awareness of the nature of his disability, though he does realize that he has difficulty in getting people to understand him.

Although K.C. is normally fluent, the kind of description found in Kinsbourne and Warrington (1963) and reported elsewhere, that the jargon aphasic speaks in a "copious flow, *uninterrupted by hesitation and correction*" (my italics), clearly does not apply to K.C. And it is on this kind of characterization that the disinhibition explanations mentioned in the Introduction are erected. That 51% of neologisms are preceded by hesitation, as compared to 18% of real words (47 to 10% with clause starts excepted), suggests that far from being the uninhibited output of the most available sound-sequence, they require some special, time-consuming process.

Lexical choice and the production of neologisms. In studies of hesitation in normal speakers, it has been found that there is a class of items significantly related to pauses in a rather similar way to K.C.'s neologisms. This is the class of words which are relatively unpredictable in context. It has been argued that the pause before such items indicates the extra time required to do the longer search necessitated by the larger ensemble of potential continuations (Goldman-Eisler, 1958; Butterworth, 1972).

Unfortunately, these authors do not present their data in a manner strictly comparable to the analysis here. However, it is possible to extract from the reported data a presentation which is broadly in line with Table 2 (see Table 3).

Butterworth's data are less similar, especially with regard to the comparison between neologisms and unpredictable items. This seems to be a

TABLE 3
DISTRIBUTION OF HESITATIONS AND THE PREDICTABILITY
OF WORDS IN CONTEXT

		Hesitant ^a	Fluent	Total
(1) Goldman-Eisler (1958)	Unpredictable	17	6	23
	Predictable	17	172	189
		34	178	212
(2) Butterworth (1972)	Unpredictable	130	460	590
	Predictable	158	1232	1390
(3) Ditto Clause starts only	Unpredictable	47	14	61
	Predictable	87	104	191
		134	118	252
(4) Ditto Words except clause starts	Unpredictable	83	446	529
	Predictable	71	1128	1199
		154	1574	1718

^a Items immediately preceded by a pause, including "promotions" (see text).

consequence of the criteria for unpredictability. He employed a different procedure for estimating unpredictable items, and his category constitutes 29% of his sample, as compared to the 11% for the Goldman-Eisler sample. Nevertheless, there is still a clear and reliable difference in the distributions for predictable items and nonpredictable items in the same direction, i.e., a higher proportion of hesitant unpredictable items.

Additionally, for those neologisms to which a grammatical class can be ascribed (138 out of 164; see below for procedure), 95% were content words—nouns, verbs, and adjectives—that is to say, classes most likely to contain unpredictable items (see Table 4).

Moreover, of the items in noun positions, neologisms were significantly more likely to be preceded by pauses than real nouns. The real nouns themselves were common, general in meaning, and a small subset of these noun types constituted a substantial portion of the noun tokens. These data do not suggest a syntactic difficulty associated with one form-class, nouns, since nouns are produced, and produced appropriately. Instead, this is exactly the sort of data one would expect to find if K.C. cannot locate any but the most common lexical items, and is deploying neologisms to fill gaps created by unsuccessful lexical search.

Syntactical functioning appears to be spared. Forty-three percent of all pauses occurred at clause boundaries, which is almost exactly the mean value of the reported studies on normal speakers where the range is between 40 and 50%. Thus either K.C.'s production system is quite intact

TABLE 4
DISTRIBUTION OF NEOLOGISMS BY FORM-CLASS

	Total	Marked			Unmarked		
		Approp.	Inapp.	Indet.	Approp.	Inapp.	Indet.
Nouns	84	17 ^a	4 ^b	10	32	1	20
Verbs	27	12	3 ^c	0	12	0	0
Adjectives	20	12	3 ^d	0	5	0	0
Adverbs	4	3	0	0	1	0	0
Conjunction	1	1	0	0	0	0	0
Preposition	1	0	0	0	1	0	0
Demonstrative	1	0	0	0	1	0	0
Total	138	45	10	10	52	1	20
Unclassified	26						

^a Plural marking, or marked with appropriate place-name morpheme (e.g., Exshire).

^b All ending [ks].

^c All in infinitival position.

^d All ending in [s].

with respect to syntax, or at least he can notice when he has reached the end of a clause and pauses in the usual manner.

The impairment of the word-finding process does not explain the source of the neologisms or even indicate if there are separate sources for different sorts of neologism. A further analysis was, therefore, undertaken to investigate this problem.

PART 2

The morphological and phonological characteristics of the neologisms were explored. It was important to determine whether syntax-driven and lexically driven morphological processes were intact, and so separate these factors from other sources of the neologisms. Two sources of neologism have been described in the literature: (i) phonological distortion of correct target words—these are usually described as ‘‘phonemic’’ or ‘‘literal’’ paraphasias; (ii) phonological distortion of an incorrect word—i.e., a combination of phonemic and ‘‘verbal’’ (or semantic) paraphasias (e.g., Pick, 1931). The picture which emerged indicated that these two sources were insufficient. (iii) Not only did some neologisms appear to be distortions of words from the immediate linguistic context of the target, but (iv) the largest class of neologisms showed a phoneme frequency distribution which suggested that they were not produced by a two-stage distortion (as in (ii)). It was therefore necessary to postulate a ‘‘device’’ which generated neologisms.

A further and more detailed hesitation analysis was undertaken to discover if the different categories of neologism took different amounts of time to produce. If delay reflects search time, then this might provide additional evidence on the source of the neologisms and on the reasons why the patient is producing speech of apparently no communicative value.

Analysis

1. Grammatical

The immediate context alone was used to determine the grammatical class of neologism. Thus in example (3) of Table 5, [*do·k*] was classified as a verb, and in example (4), [*frand*] was classified as a noun. In this way it was possible to assign a grammatical class to 138 out of the 164 neologisms in the corpus. Also by using immediate context, the appropriate grammatical morphology could be determined. Thus in (3), where the verb should be in the infinitival form, the appropriate morphology requires that the verb is uninflected, as indeed it is in this case. Similarly, in (4) the noun should be singular and uninflected, as it is. However, in (6) the neologism needs to be a present participle with an *-ing* ending, which it has. In many instances, the form could not be determined by context—

for example, it might be impossible to tell whether a noun was singular or plural—in which case the regularity of the morphology was considered “Indeterminate.” In this way, all classifiable neologisms were classed as to whether they needed morphological marking or not or were indeterminate, and whether the presence or absence of a bound morpheme was appropriate.

2. Neologisms Phonologically Related to Prior Context or to Following Context

A neologism was counted as related to prior or following context, if at least four features of the word and the neologism were common. (By “feature” is meant phoneme or phoneme’s position in a syllable.) Thus in example (6), [wɔ́tɪŋ] is related to [wɔt] on six features: three phonemes and three phoneme syllable-positions—[w] in Position 1, [ɔ] in Position 2, etc. In practice most items so counted had more than four features in common. Usually the word and neologism will be adjacent, or at least in the

TABLE 5
EXAMPLES OF SIX TYPES OF ERROR^a

-
- (1) Verbal Paraphasias (solid underlining)
 (1) *And he was queen that I was [hódl] with . . .*
 (2) *But I seem to be table you correctly, sir.*
- (2a) Neologisms Phonologically Related to a Prior Word (in square brackets)
 (3) *. . . want everything to be so talk. I do not yet [dɔ·k]*
 (4) *. . . I was able to show it to a friend. And then I have er—I have another [frænd] or two . . .*
- (2b) Neologisms Phonologically Related to a Following Word (in square brackets)
 (5) *she has to do things [wámən] a woman who helps*
 (6) *I've been very much [wɔ́tɪŋ] what to do*
- (2c) Neologisms Phonologically Related to a Target Item (in square brackets)
 (7) *I remember the other [dókumèn] (doctor)*
 (8) *A [čərk] (chair)*
- (3) Neologisms Phonologically Linked to Other Neologisms
 (9) [bæklænd] . . . [bændlks] . . . [ændlks] . . . [zændlks] . . . [lændɔks] . . . [zæprlks]
 (10) [nɔks] . . . [mɔk] . . . [Invɔk] . . . [wɔkʌf] . . . [vɔk] (nestings and continuations)
 (11) [zi·n] . . . [zar] . . . ([zéleks] . . . [vétreks]) . . . [zɛp] . . . [záplɔn] . . . ([líklɔn] . . . [líklɔn] . . . [mɔ́trænd] . . . [záplɔnd] . . . [práizəh] . . . [sárlí])
- (4) Other Neologisms (in square brackets)
 Some of these may be related to targets, e.g.,
 (12) *I used to get my [górdərwərd] [pídlam] (word order muddled?)*
 (13) *I would always [dllárn] (learn?) something very quickly*
 (14) *. . . because I'm [wɔ́tred] waiting (taps belly) (weight watching?)*
 Others Apparently Not:
 (15) *. . . even with a [kwáilai] return*
-

^a See Appendix.

same clause. But for very striking cases, like (3) and (4) which have six and eight features, respectively, in common, adjacent clause context was included.

3. *Neologisms Phonologically Related to a Target Item*

It was frequently possible to establish with some degree of plausibility the identity of the target word. At least four features in common was the criterion in this case.

4. *Neologisms Phonologically Linked to Other Neologisms*

This turned out to be the largest class of classifiable neologisms, 55 out of 96. Examples are given in Table 5, (9)–(11). The criterion was that the items should share at least four features. Apart from repeats, of course, successive neologisms related in this way differed in one or a few features, such that the end of the chain may have only a couple of aspects in common with the first, though each pair satisfies the criterion, e.g., (9), or indeed none at all, e.g., [zin] . . . [zar] . . . [zéléks] . . . [vétreks]. There were examples of this latter type, where K.C. seemed to return to the original sequence, e.g., in (11), which are examples of a kind of "nesting." Since the source of these neologisms does not seem to be a target word or another word in the immediate context and since a single source seems to be responsible for a string of them, they will be referred to as having been generated by a "device" whose properties are as yet mysterious. notice that phonologically linked neologisms differ from the *conduite d'approche* phenomenon in two clear ways: First, the neologisms in a linked sequence are separated by real words (see Appendix), and second, they cannot represent successive attempts at the same target since the items in a sequence each occur in quite different linguistic contexts.

5. *The Remaining Neologisms*

These included examples like (12) and (13) where confidence in the determination of the target item was less, or where no phonological relation could be discerned, or where no target was determinable.

6. *Verbal Paraphasias*

See criterion in Analysis, Part 1. Members of the Mathematics Department, some of whom had experience of code-breaking, categorized items in the course of trying to gloss the text. A consensus of suggested categorizations was taken.

7. *Hesitation Analysis*

For each category a mean delay was computed. This was simply the total pause time before each item divided by the number of items in the

category (including those uttered fluently, i.e., with no pause preceding them). The usual adjustment for "promotions" was made (see Methods for the procedure).

8. *Phonological Analysis*

Neologisms were checked for their conformity to the rules of English phonology. The frequency distributions for initial phonemes in the various error categories was examined, using the phoneme frequency table (Table A) drawn up by Hultzen, Allen, and Miron (1964). The *initial frequency value in the language* was assigned to the initial phonemes in each error category and, for comparison, to the first 100 words and 100 content words in K.C.'s transcript (since most neologisms appear to stand in place of content words). The mean initial phoneme frequency value in the language could then be assigned to each category. (It should be noted that the phoneme frequency data are from a North American corpus, and adjustments had to be made for the vowel data. Additionally, starred and unstarred vowel categories were collapsed (see Hultzen et al., 1964, pp. 8-9)).

Results

1. *Grammatical*

The distribution of neologisms by grammatical class is presented in Table 4. Of the 138 thus classified, 61% were nouns, 20% were verbs, and 14% were adjectives; 70% used appropriate morphology, and only 8% used inappropriate morphology, of which 7 out of the 11 instances are morphemes of number ending in [ks] or [s] which bear some ambiguity as to appropriateness since many singulars have these phonemic endings, e.g., crux, mince.

2. *Hesitation Analysis*

These data are summarized in Table 6. They show that the mean delay before verbal paraphasias is reliably shorter than before neologisms; and neologisms phonologically related to a real word or to a target show a mean delay reliably shorter than phonologically linked neologisms. This last class is also considerably larger than the other two. It should be added that there was no evidence that neologisms at the beginning of a "chain" required a significantly longer delay than in other positions in the chain (0.75 vs. 0.47 sec) though the numbers are really too small for reliable comparisons to be made ($t(45) = 1.18, p < 0.1$).

3. *Phonological Analysis*

All neologisms, except [s·], obeyed the rules of English phonology. However, the initial phoneme frequency differed interestingly from the

TABLE 6
MEAN SILENT DELAYS BEFORE SIX TYPES OF ERROR

	Verbal para- phasias (1)	Neologisms phonologically related to			Neologisms generated by "device" (3)	Other (4)
		(a) Prior word (2a)	(b) Following word (2b)	(c) Target word (2c)		
<i>N</i>	35	12	8	21	55	68
Mean delay (sec)	0.135	0.233	0.250	0.348	0.494	0.301
		<i>N</i>		41		
		Mean delay (sec)		0.295		
<i>t</i> tests		(1) vs (2): $t(74) = 1.66, p < .05$ (one-tailed)				
		(2) vs (3): $t(94) = 1.85, p < .05$ (one-tailed)				

Note. There are no reliable differences between (2a) and (2b), (2b) and (2c), or (2a) and (2c).

initial frequencies in the language. The results are summarized in Table 7 and expressed as mean percentage values (that is, the mean phoneme frequency in each category occurred in $x\%$ of initial positions in the language). *t* Tests revealed that only category (6) differed significantly from the other categories ($p < 0.002$, two-tailed, for the pairwise comparisons of (6) with (1)–(5)).

There were thus 36 possible initial phonemes: If each initial phoneme occurred equiprobably, it would have a value of 2.7% which turns out to be statistically indistinguishable from the value for category (6). That is to

TABLE 7
INITIAL PHONEME FREQUENCIES IN THE LANGUAGE FOR THE INITIAL PHONEMES OF
WORDS, VERBAL PARAPHASIAS, AND TWO KINDS OF NEOLOGISM

	Frequency (%)	SD
(1) First 100 words of K.C.	4.3	1.9
(2) 100 content words of K.C.	4.2	2.0
(3) 100 unpredictable content words (normal speakers) ^a	3.8	1.8
(4) Verbal paraphasias of K.C.	3.6	2.0
(5) Phonologically related neologisms (Cats. (2a)–(2c), Tables 5 and 6)	4.1	1.8
(6) Device-generated neologisms (Cat. (3))	2.2	2.5

^a Data from Butterworth (1972).

say, the initial phonemes of device-generated neologisms could have been selected at random from a non-frequency-biased ensemble.

Discussion

The hesitation analyses retrospectively justify the initial categorization into kinds of error. More than that, the difference in delay times indicates that the routes to the productions in the error categories must be in some respects, at least, different. The striking feature about these data is that delay time appears to depend upon the amount of phonological information K.C. can recover or which he accepts as being recovered from the target item. In the case of verbal paraphasias he is recovering the full phonological specification of at least a root morpheme. In the case of neologisms phonologically linked to other neologisms, he apparently can recover no phonological information about the target item, and instead appears to employ some "standby information" from a previous running of the neologizing device. In the other cases, partial information is available from the target or else partial information from an uttered or intended word which cannot be distinguished from genuine, but partial, information from the target.

The mean frequency in the language of the initial phoneme in the "device" category, which was so much lower than the value for the other categories, does strongly suggest that the source of such neologisms is not the same as for other errors, or indeed for other content words. This result, incidentally, is not compatible with the hypothesis that apparently inscrutable neologisms—that cannot be classed as literal paraphasias—are the result of a two-stage distortion process whereby, first the wrong word is chosen (verbal paraphasia), and then this word suffers a phonemic alteration (literal paraphasia). Such a hypothesis has been frequently advanced, e.g., by Pick (1931) and by Buckingham and Kertesz (1976). (These data also indicate, perhaps, that a few error items may have been misclassified in that a few verbal paraphasias were, as suggested in Analysis, Part I, "jargon homophones" of real words, and a few target-related items may have been the product of "jargon homophones" phonemically distorted, thus bringing down the mean frequency value below that of the real content items. However, the data are too scanty to advance this view with much confidence.)

Moreover, the morphological system seems almost perfectly intact, even where the arcane principles of English place-name morphologies are concerned (as shown by the neologisms [émčarč] and [éks·šiar]—Emchurch and Exshire). Since bound morphemes are correctly appended to neologistic roots, morphophonemic processes (i) must operate *after* roots (real or neologistic) are selected, and (ii) must operate on instructions from an intact higher-level system, presumably the intact syntactic system.

GENERAL DISCUSSION AND CONCLUSIONS

1. The Generalizability of These Results

The pattern of neologizing exhibited by K.C. corresponds closely to cases reported by Green (1969) and Buckingham and Kertesz (1976). They found neologisms which were phonologically related to presumed targets and noticed also characteristic chaining of phonologically related neologisms. neither study, however, examined the effects of immediate phonological context on neologistic production. Thier cases showed the typical comprehension and object-naming deficits combined with speech which was clinically described as "fluent." As with K.C., both reading and writing were very poor, even nonexistent.

2. Strategic Adaptation to a Word-Finding Difficulty

The data on K.C.'s speech point primarily to an impairment of the system responsible for associating word-meaning and word-sounds; and as far as can be determined, other parts of the production system—those handling syntax, morphology and phonology—are intact. Neologisms appear to serve as substitutes for the root form of lexical items, when presumably these cannot be retrieved from the lexical system. That is to say, K.C. has a *strategy* for coping with this functional disability that involves using a substitute for the target item. (By "strategy" I do not imply a conscious procedure; all that I would claim is that the patient is not compelled by this functional disability to behave as he does, indeed, he may well begin to behave differently if resultant behavior proves communicatively or socially unsuccessful.)

Notice that the uncorrected use of neologisms (and verbal paraphasias) indicates that K.C. cannot effectively monitor his own output or edit out errors prior to output: That is, he cannot reject a neologism or a verbal paraphasia because it does not mean what he wants it to mean, and this implies that the mapping of the word-meanings and word-sounds is impaired bidirectionally. This single functional impairment, thus, explains not only the absence of the appropriate lexical items in speech, but also the presence of erroneous forms and the impairment of comprehension. However, the mapping failure in itself does not explain why K.C. produces the kinds of neologisms he does.

The relevant evidence for the sources of neologisms comes from the kinds of neologisms produced together with delay preceding the production of tokens of each kind. The neologisms phonologically similar to real words—to those in the immediate linguistic context or to the intended target—can be assumed to have these real words as their source; but somewhere in the system the phonological information about the form of the real words has been degraded or partially lost. Moreover, the system does not screen out these erroneous productions by checking their status

against a mental inventory of real words. Interestingly, these neologisms are produced after a shorter silent delay than those that cannot be given a real word source, i.e., the neologisms phonologically linked not to words but to other neologisms. We must, therefore, hypothesize a "device" that generates new root morphemes (the bound morphemes clearly get added later); we must also hypothesize a control process that determines whether a root morpheme has been successfully located by the lexical search. Of course, this control lets through neologisms and verbal paraphasias. Notice that the two hypotheses are independent: Neologisms may be (correctly) generated but largely or entirely screened out. That they are not, and that they occur systematically in lexical item locations, suggests the possibility of a strategic adaptation to the functional disability; these considerations allow us to postulate three candidate models of the strategic adaptation that are consistent with the data.

(1) There is a (relatively) fixed upper limit to lexical search time, and the delay differences among the different categories of neologism are a consequence of how much phonological information the output system has available to it. It takes longer to start from scratch than from the full information about the root morpheme.

(2) The availability of phonological information terminates the search, but partial information is less effective in doing so than full information. Presumably if no information is available, upper limit in delay terminates search. Another way of expressing this would be to say that K.C. uses an ordered set of strategies for phonological output.

(3) Some combination of both models, that is, delay is a combined function of search time and phonological construction time.

The evidence for preferring one model is slight. All three models are consistent with the data from delay and with the word-class effect. However, the data from the chaining examples, where the beginnings to chains are not significantly different from elsewhere in the chain, support model (2). One would like a larger sample, since the difference .75 to .47 is in the direction predicted by models (1) and (3). The initial phoneme frequency data suggest a qualitative distinction between neologisms hypothesized to use partial information and using no phonological information from the lexicon, which not only supports the idea of a special neologizing device, but also points, if weakly, to model (2) represented graphically in Fig. 1.

The "device" postulated can be thought of as a subsystem with a buffer. Phonemes will be selected randomly or arbitrarily and strung together in the buffer in a phonotactically regular manner, so that they sound like (unknown) words of English, rather than French or Ewe. Buffer storage will be constrained by a delay parameter, so that after a given period none of the phonemes in the string will be available. Within that period some phonemes will be available from the last running of the

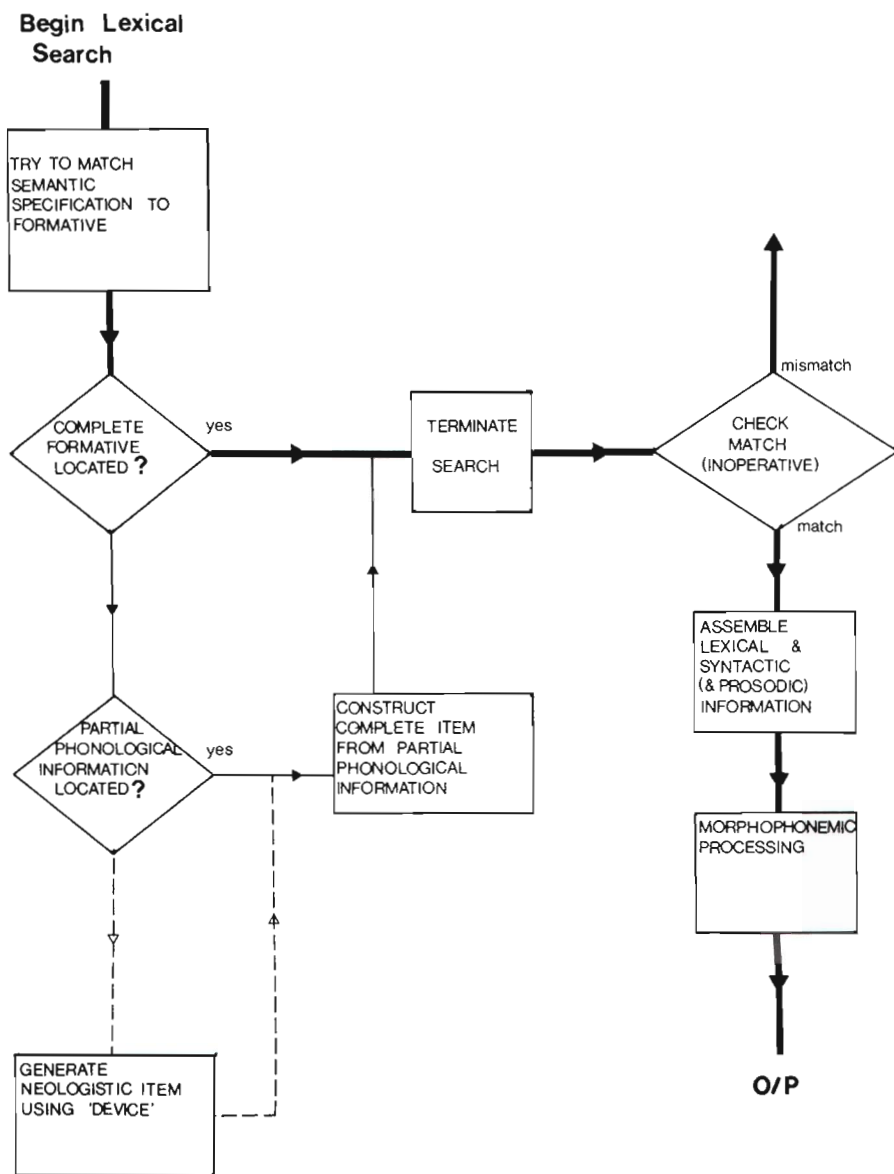


FIG. 1. K.C.'s strategy for coping with a word-finding deficit. The thick line indicates the route for producing a real word (including a wrong word) and depends on finding a complete formative—the full phonological specification of the lexical root. Since it is assumed that both comprehensive and output monitoring are impaired, the usual checking procedures for the appropriateness of the word chosen are inoperative. The thin line indicates the subroute for producing neologisms related to real words (Category 2, Table 5). It is assumed that only partial information can be recovered from the lexicon. When no information can be recovered about the phonological form of the word, the "device" comes into play and produces Category 3 (Table 5) items. This subroute is indicated by the dashed lines. The subroutes converge on the normal assembly and morphophonemic processes. Delay times are hypothesized to be correlated with route length to give the data in Table 6.

subsystem. This would explain why similar-sounding neologisms are strung together, but also, from time to time, a set, sounding different from the first, is begun.

In addition, it is plausible to explain the characteristic circumlocutions of the jargon aphasic in terms of a strategic adaptation to a word-finding difficulty. If low-frequency items are relatively unavailable, one way of compensating for this would be to use a high-frequency item which does not fit the semantic specification as completely, or to use a combination of high-frequency items which may fit better than a single item. Notice that this assumes that high-frequency meaning-sound links are still intact. The criterion of fitness of a candidate item may change in the course of recovery or in the course of learning how to cope with the functional difficulty.

The recovery data from other cases, where clinically fluent neologizing is replaced by less fluent, anomie speech, can be accounted for in two ways. (i) The neologizing strategy may be found to be communicatively ineffective and the search time constraints may be lifted—or the fitness criterion made more severe—giving the speaker a better chance of finding the right word. Alternatively, (ii) the checking procedures may recover enabling the elimination of neologisms. And, since access to low-frequency lexical items is particularly impaired (or perhaps these items may themselves be damaged), a severe word-finding difficulty would remain.

Paragrammatisms that are a consequence of using a word of the wrong grammatical class do not then necessarily indicate a syntactical impairment, but would rather be a second-order effect of the word-finding difficulty. In which case, the tests for the intactness of syntactical processing would be the distribution of pauses with respect to clause boundaries and the appropriateness of the morphology (since instructions to morphologize are held to be sent down to the "Assembler" with the syntactical frame as output from the syntactic processor). It should be mentioned that the interpretation of morphological error rates requires comparison with other samples. Translating the data into errors/1000 words yields 2 or 5.5 errors/1000 words (according to treatment, see Results, Part 2) which seems rather higher than the rate for normals though much lower than for a global aphasic (see Shallice & Butterworth, 1977; although those data are not classified in quite the same way as here).

Naturally, though K.C. resembles other cases in the literature, insofar as can be judged from the clinical and linguistic descriptions, generalization waits on similar analyses of other cases. Some other features of jargon aphasias occasionally reported can be accommodated readily to this kind of explanation. For example, Alajounaine et al. (1952) mention one patient, M. Cor. . ., of whom they observe "Surtout l'expression

verbale est dominée par un trouble très spécial: incapable d'évoquer lui-même le mot le malade n'est pas aidé par l'audition de celui-ci" (p. 313). On the other hand the kind of anosognosia, which manifests itself as jargon specifically related to topics concerning the patient's disability reported by Weinstein et al. (1966) and Kinsbourne and Warrington (1963) is not present in K.C., and is not explicable in the model presented here. But in the sample under examination, the conversational parts in which K.C. talked about himself yielded 8% of words produced which fell into one of the error categories, whereas in object-naming there was a 12% error rate. This suggests, at least, that jargon cases fall into two categories: anosognosic and nonanosognosic. However, these authors have not adequately controlled for the kinds of lexical items required by the two speaking tasks, and it may be that their tasks talking about one's disability made greater demands on low-frequency lexical items.

The hesitational analyses presented here have, we hope, clarified a strategy one patient employed to cope with a specific functional impairment, in an endeavor to go on communicating through speech. In Goldstein's words, "the aphasic patient tries to achieve a condition which allows him to react as well as possible to the tasks arising from the environment" (1948, p. 21).

3. Jargon Aphasia and Normal Speech Production

Is the postulation of a purely lexical disability consistent with what is known about normal speech production processes, or would a lexical disability lead to malfunctioning in other processes?

The separability of lexical and syntactic processes has been suggested by hesitation studies (Butterworth, in press,a; Goldman-Eisler, 1968, Chapter 5) and demonstrated by the analysis of slips of the tongue, where whole lexical items can be transposed without affecting syntactic structure, e.g. (transposed element underlined):

- (7) a. Wait'll you see the one I kept pinned on the room to my door.
 b. They left it and forgot it behind.

(From Garrett, 1976.) Moreover, it can be shown from slips data that at some locus in the production process root morphemes and affixed morphemes are separately represented. Garrett (1975, 1976, in press) reports errors in which root morphemes transpose leaving grammatical morphemes stranded:

- (8) You ordered up ending . . .
 (Target: You ended up ordering . . .)

Garret even reports errors in which the grammatical morpheme moves leaving the root stranded:

- (9) a. . . . add ups to
 (Target: . . . adds up to)

- b. I want to eated my beans first.

(Target: I wanted to eat my beans first.)

Notice, by the way, that in (9b) the movement of -ed produces the morphological error eated, not ate: a strong indication that not only are past tense morphemes generated separately, but that adding the morpheme is carried out independently of higher-level processes that check the output for word-status. It is thus plausible that the root morpheme system in K.C. could have been impaired without affecting the grammatical morpheme system.

Derivational morphology is a somewhat cloudier issue. There is evidence that the derivational affixes that turn roots into nouns, adverbs, etc. (e.g., *divine* → *divinity*; *strong* → *strongly*) are represented separately from lexical roots. Garrett (in press, 1976) reports errors where roots transpose stranding derivational affixes:

- (10) a. McGovern favors pushing busters.

(Target: McGovern favors busting pushers.)

- b. You have to square it facely.

(Target: You have to face it squarely.)

Notice, in (10a), that -er stranded along with the grammatical affixes -ing and s, and in (10b) the adverbial affix -ly is stranded. Thus K.C.'s control of place-name morphology on neologistic roots (Em + church, Ex + shire) or on real words (yet + ly) is consistent with separability of root and derivation in normals. (However, Cutler and Isard (in press) argue, from the lexical stress errors, that, even if derivations can be added to roots, some derived forms will be represented in the lexicon.) Finally, the sparing of intonational processes is consistent with current hypotheses about the sources of intonational contours. Chomsky and Halle (1968), on purely linguistic ground, argue that the location of sentence stress is determined by syntax. If, as I have argued, K.C. has intact syntactic processing, there is no reason to expect his intonation to be impaired. However, Cutler and Isard (in press) report intonational errors that leave all other aspects of the utterance as intended; they argue, therefore, for an autonomous intonation-contour generator, where only the domain of the contour is specified by the syntax. Again, a purely lexical impairment should not affect the ability to produce the appropriate intonation.

APPENDIX

Transcript of K.C.'s Speech

Key. The interviewer's speech is in CAPITALS. Pauses longer than 250 msec are indicated by #. Neologisms are represented in standard phonetic symbols and are enclosed in square brackets; verbal paraphasias are spelled normally but are underlined.

Thank you very # much for allow me see you # as I have been. # I've been a trouble to others often. # But I'm glad to see you again, and I would # be grateful to do # anything which I should do.

DO YOU REMEMBER MY FACE?

I forget seeing you before, sir; I remember the other [dɔ́kumèn] # and was [plezd] to see the other [dɔ́kumèn]. # My brother was with me. # And he was queen that I was # [hɔdl] with our own little # mm # bog, # my thing of [mɔgrí?], # you know, and he said 'oh thank you' he'd get it redone # and [táipld] again. I've done one or two things with that—# with my brother # whom you've seen with me # and he's waiting for you. # And I'm so sorry to do the boy all the trouble all the time. # I would love to see any one # even with a # [kwáiláí] return, # so that I could coo you with my brother. # But he's so very busy. # He's so busy. # I'm #—I myself # [Im éksenám] # alone and at works # and want everything to be so talk. # I do not yet [dɔ·k]. # I want # a lot more things more yet. # I just saw that the other week. # It was given me, # and I very much want it, # but I don't get it # [yétlí]. # [névərðəlèks] I was able to showed it to a friend. # And then I haver er—# I have another [fránd] or two whom I have. # And I do very much # want # the other [frándz] to mean # what I'm speaking secondly about things. # And wherever I am do—# do # things to show friends, # er with one of you. # er # Yes there, # there where I was able to [zóniks]—# there now # and I was glad to do it. # I'd never done it before # except the other week. # And so I [trud] those things with my # small people # there's a woman who comes and then # she has to do things # [wámən] a woman who helps, # and then I wait for ten # three weeks, the boy before he's [bédi] again. # And then I don't want him to worry him with other things. # I'm rather # alone. # But I'm very much better than the # [báitren] was was waxen me in the band, # [klíni], a year ago with the # [gərd]. It was about # in—m. # [edzmiríks] # in [éks·sɪər] # nearest to [émčərč]. Then I had to get—# I then had to get # the line right up, # right up where the land had gone # [lónli] # And then it was ours # from that brother for me to find a bit about it. # And the whole thing # was very very rudely and # [tɛrtflk]. # It went for a year. I was # shocking. # But I seem to be table you correctly sir, # than I did the other week # a little. # I think I'd been saying what I said. # But I'd never tried to #

*-

*-

(Given matchbox)

I don't have them. I don't do it, you know. I don't [hæmn] my # no no. # I only have my [sərmliz]. # These are for yours.

WHAT DO YOU CALL THIS?

These are—# I do have them at home # at home # then they're lended

WHAT DO YOU CALL THIS? WHAT DO YOU CALL THIS?

[wétrisèz] # [wétríksèz] # A [bæklənd] # and another bank. # For [bændíks] # er # [bændíks] I think they are, # I believe # they're [zændíks] # I'm sorry, # but they're called like # [flitərz] # [lændɔks]. #

LET'S LOOK AT THIS (telephone). WHAT IS THIS?

oo that # That sir; # I can show you then # what is a [zépriks] # for the # [élencom] # the [élencom], with the [pidlənd] thing to th. . . # and then each of the [pidləmz] has # an [áiyín]—one, two three # and so on, # and the # [æDRAM] can be correct # to [sus] # taken. # But it's a—# a thing of document. But a

VERY GOOD. WHAT'S THIS? (scissors)

Yes, I know those. # I know tho- # I had them # a week or so before, sir, there they are, sir, two # [máitɛks]. # you get the one one, and the smaller one, # rather larger smaller. # And then the two [wáitɛks], # would become with the # vice, # the [voit] of er # [swi·n] thing # ax # to # [dizíd] # the thing as it is. #

WHAT'S THIS? (a book)

Again, sir, was the sort of # [intreks]. # There was the on # of # of # indicate of [víntri] of # foxing # with one sort of matters # from on orders. # A similar # design to other peoples. # Again [báiyatrís] # in [ríyátiks], # just, # not # actually, but # [mǽtral], # [kǽméiʃ]. # Thank you, sir.

WHAT'S THIS? (chair)

a [čǽrk]. Yes # yes. I've got my #—I like it because I like that sort of thing myself, with # yes # yes, and then the that, that, and the [kwǽr], and the other [kǽr]. # And the whole thing can be on # two # with the two and two. # Little bit. # Smaller, # and it would, so something correctly. # that sort of thing could be # [s·] # with [wat]; # be correct # indication.

(a lady's shoe)

Yes sir. Now there there I remember # I have you there what I thought was the # [lǽklǽnd] # [boim] of # of # [fú·dī]—food—food something. A lady. # one, # 'nother # a[luften] # with a very short # [dǽizáin]. # [vǽks]. # Very very # clever done # do that the one two # go, but there's the liver. # And there is the new #—and so on. # It's a #—It is a document # late # and another # one one. #

-*-

-*-

WHAT WAS YOUR JOB?

I could when I was a boy # about # three [nʌks] years # I was very very deeply er # as a [médland] of the # London # er # General # [vékles]: # the [lǽkklǽ]—the er # General [éksli]. # Yes # that the great thing, # quarter # place in [zémles] # The great # [zímles] where I used to work with hundreds and hundreds, # for many years. # And for years and years I was once # a speaker there as a solicitor # by # [ǽkupǽn]. # I used to know them all # in [zǽklǽnd]. # And my [mǽdǽks] # was always # say things. # I would always [díárn] something # very quickly. It used to be my habit, # because I was the # quickness # solicitor; # whereas one could do that (taps table) no, no, no. # The [kwǽrkland] had to go and meet # the [míklǽnd] of [zénθ], # and people like that, and be wreck with them; # and all them speak them, # and always have them there (their?) [lénemiz]. # And since then, about, # ooh, thirty years # as a er er [pláiyin] again. # I've done a lot too much # Uh-huh # with my dear son, and recently seeing my need. # I've got to plied up. # I've got to plied again.

DID YOU HAVE LUNCH TODAY?

Ooh, I didn't late before, no, yesterday I simply went with my # breakfast with my # er # [zíniks] thing (claps right palm on back of left hand several times) # one, # then again at twenty, # [zíplǽn] # and a [ti·k] (tea?) thing. # Nothing to [i·k]. # But I would work tomorrow, tomorrow I would [íntǽrm] # league er # barrack stuff then, # but not # not the [rowi] thing because I'm [wǽired] waiting (taps belly). # I've been very much [wǽitij] # what to do. # For years I've been second to just be # keen whether or not I got it, # but I've been necking to # get # quite well. # (Cough) and my [mǽtrǽks] is better # the last # two years better #

WHAT IS YOUR FAVORITE FOOD?

I'm not very happy doctor. I've not [nǽtǽr] with the [vǽrkǽr], because I don't enough. I just have # er [krǽsi·] stuff. # I don't have [nu·d], # just the ord'ary # heavy grass. # Then I have a lot of [dik]—# er # [gru·d], # [gru·d] co- # always [gru·d] # stuff. # And then I'll put a nor # in the [klǽrθ] and—# I don't have a lot! # And just lately for the—for the lot, I've [ví·tǽn] (I've eaten?) # the [nǽks]—# the the the [mǽk], # [mǽk], the [invǽk], # [wǽkǽf]. # I'm not a [vǽk] ([ǽvǽk]?). #

I like them very well, and could [wi·tə] like, but I don't bother, # because I go on this # particular, just a [zlk], # 'nough for a [dɛyərkwɪ·], enough, # and the way I go on. # And then at night # then I want something like er # er er # [mi·tris], or perhaps a little # er # youth # er [vi·t]; # something of that sort; # but nothing very good. I ought to [mópəra] # more really, # but I haven't—haven't done [vétreks] really. # I haven't done it as I should do # more. And I'm grateful, sir. # I'm very very [zóltra] # that I was able # er # to be you here and speak to you in that way, (inbreath) # because I'm always deacon zone # (laughs) # with my boys, my boys. They do- I don't like them. # (laughs) # They're all right. # (laugh) # But with you two # I have been # well, # er # very very [sálvra]. # Something, I think, # has been said # before, # and it's never before bee' said. # No. # I used to get my [górdərwərd] [pidlɔm] and # so on, you know, bu- # er # (produces papers) There! er a lady. She had it the other day. She had a date, you see. Well, my brother # bought # that. # But nevertheless I wanted to water to the woman myself as well, # (taps papers) which I'd know as [zæɪ] (that?), # and I like it, # because I can [zait] it even to her. # But nevertheless I'd [váitəd] her as well, # my daughters # er # [intrɪm] to do it, # because I didn't want it # without. # Well I was so- # I was terrible to do it, you see. I hadn't eh- # I hadn't got the [kóintɪs] nicely. # I hadn't, and I haven't still, # I've nothing [ækər] yet. # And when I'm home, # I'm fed up with them # all. # I'm [fédi] with the lot of them. # And I think I can get off and I can get on perhaps. # And then there's a friend I can [zi·n], there's a gentleman, # a gentleman who comes with me # er er er so that the [zar], to tell you the gentleman the [zar]. # He comes # here. # There: # [zéléks], # [vétreks]. # Now that bloke # is a nice fellow, # who used to be a manner in # [ərlændyɪər], years and years ago and had all sorts of [di·]. He was a clever man, # but I liked him. # Now (cough) I [wi·k] with him, # and after three weeks # I've had my # piece of green and my [zəp] # stuff, # my bit of [zɪplɔn] with my bit of [blémit]. # And I'd got it, # and I happen to have # messed with him. # I didn't think I [wɔd] would it. # But he liked it. # He so [zɪklən] to a yards, to a yards, he saw it. # He said 'Good'. # Now, I'm only saying that # I couldn't think anything # myself. # I was fed up, you know. I was fed up to all of them erm. # And yet # after about two [ɪklən] # I had from that man, # who- whom is on his own. He [mɪvz] in love- # beautiful home. # And he saw it. # And then he looked at it # (diminuendo) and it turned him. # You know, like this sort of- this see er something. # And it was something and something had gone in in a lot of [ɪndreks] with that man. And I'm only just returned it that had happened to me. # I think I ought to say I—that had happened. # And I no other. # But, but, # gentlemen, I'm (laughs)—# I'm very very irritated with most people who are near me: # The woman who comes and so on, you know, and # and somebody else ha # ha but they—if only they could ma' me a little lane where I get my # er er little bit of er [mótrænd]. I've got a lovely one: # just right. # And that brother, that brother # he can [zɪplænd]. He can yeh- # But he alone could leave me alone; do it quietly, in a proper place # [práizəli] # [sárlɪ] # come to the [kwɔts] # correctly. # It's only what I think. # If I [di·nt] I think I could. # With my daughter lately, # when she [wɪksəz] a [zɛn] from me in # two years # near [ókeθ] # [zókeθ], # [éntrɪks], there she is. Well! # I can just take her line and there quietly send thee (?) this # and sense. # Then wait. # And meet her for another few years, # and help her. # Then quietly go on. # Then I'm all right. # Then I'm all right! # (crescendo) I'm absolutely all right! # I'm doing well! Because, you see, it's this: # having to keep open all the while and [wɔ?], because I don't [lun] things. I'm wrong, gentlemen, # gentlemen I can keep that # but at the moment I don't # [zɛm] # [i·rvk] and these other cheap who should speak of the [éprvks]. #

UH HUH

I'm naughty there. I'm still naughty wrong, # very naughty. # I'm wrong. # I apologise in [zɪmθ] them, I do. all of them. # I'm sorry. I do. But there are a few [zámɹəz] # occasionally, that I've just # looked at [zámtrɛks] # and # that. But somehow the [zárðər]

doesn't come, you see. But I want it. And then lately, lately, it seems as if—# later there will eventually maybe. # There's no ex- # extra rocks yet which I want. # But it doesn't come yet. #

UH HUH

And yet I want it. # I'm very want it. # But I do get it with quietly. # I must be—# I must be very very quietly alone for weeks [bi'ɛvər] I do it. #

UH HUH

Er # The wrong thing—# The wrong thing I'm 'ow too [ótamz] too quickly, which is wrong.

YES

But I don't mean to do that.

Note: A section where K.C. reveals his name has been withheld. It consisted of 94 words, including 8 neologisms and 1 verbal paraphasia.

REFERENCES

- Alajouanine, T. 1956. Verbal realisation in aphasia. *Brain*, **79**, 1–28.
- Alajouanine, T., Sabouraud, O., & de Ribaucourt, B. 1952. Le jargon des aphasiques. Désintégration anosognosique des valeurs sémantiques du langage. I. Analyse des aspects principaux. II. Observations commentées. *Journal de Psychologie*, **45**(1), 158–180; II: 293–329.
- ✓ Brown, J. 1972. *Aphasia, apraxia, and agnosia: Clinical and theoretical aspects*. Springfield: Thomas.
- Buckingham, H. W., & Kertesz, A. 1976. *Neologistic jargon aphasia: Neurolinguistics III*. Amsterdam: Swets & Zeitlinger.
- Butterworth, B. 1972. *Semantic analyses of the phasing of fluency in spontaneous speech*. PhD Thesis, University of London.
- Butterworth, B. 1975. Hesitation and semantic planning in speech. *Journal of Psycholinguistic Research*, **4**, 74–87.
- Butterworth, B. In press. Evidence from pauses. In B. Butterworth (Ed.), *Language production* (Vol. I). London: Academic Press. (a)
- Butterworth, B. In press. Constraints on models of language production. In B. Butterworth (Ed.), *Language production* (Vol. I). London: Academic Press. (b)
- Butterworth, B., & Beattie, C. 1978. Gesture and silence as indicators of planning in speech. In R. Campbell, & P. T. Smith (Eds.), *Recent advances in the psychology of language: Formal and experimental approaches*. New York: Plenum.
- Chomsky, N., & Halle, M. 1968. *The sound pattern of English*. New York: Harper & Row.
- Cutler, A., & Isard, S. In press. The production of prosody. In B. Butterworth (Ed.), *Language production* (Vol. I). London: Academic Press.
- ✓ Garrett, M. F. 1975. The analysis of sentence production. In G. Bower (Ed.), *Psychology of learning and motivation* (Vol. 9). New York: Academic Press.
- ✓ Garrett, M. F. 1976. Syntactic processes in sentence production. In E. Walker, & R. Wales (Eds.), *New approaches to language mechanisms*. Amsterdam: North-Holland.
- ✓ Garrett, M. F. In press. Evidence from speech errors. In B. Butterworth (Ed.), *Language production* (Vol. I). London: Academic Press.
- ✓ Goldman-Eisler, F. 1958. Speech production and the predictability of words in context. *Quarterly Journal of Experimental Psychology*, **10**, 96–106.
- ✓ Goldman-Eisler, F. 1961. Hesitation and information in speech. In C. Cherry (Ed.), *Information theory*. London: Butterworth.

- ✓ Goldman-Eisler, F. 1968. *Psycholinguistics*. London: Academic Press.
- Goldstein, K. 1948. *Language and language disturbances*. New York: Grune & Stratton.
- ✓ Green, E. 1969. Phonological and grammatical aspects of jargon in an aphasic patient. *Language and Speech*, **12**, 103-118.
- ✓ Howes, D. 1964. Application of the word-frequency concept to aphasia. In A. V. S. de Reuck & M. O'Connor (Eds.), *Disorders of language*. Baltimore: Williams & Wilkins.
- ✓ Howes, D., & Geschwind, N. 1964. Quantitative studies of aphasic language. In D. McK. Rioch & E. A. Weinstein (Eds.), *Disorders of communication*. Baltimore: Williams & Wilkins.
- Hultzen, L. S., Allen, J. H. D., & Miron, M. S. 1964. *Tables of transitional frequencies of English phonemes*. Urbana: University of Illinois Press.
- Jackson, J. H. 1958. *Selected writings II*. New York: Basic Books.
- Kertesz, A., & Benson, D. 1970. Neologistic jargon: A clinicopathological study. *Cortex*, **6**, 362-396.
- ✓ Kinsbourne, M., & Warrington, E. 1963. Jargon aphasia. *Neuropsychologia*, **1**, 27-37.
- Maclay, H., & Osgood, C. E. 1959. Hesitation phenomena in English speech. *Word*, **15**, 19-44.
- ✓ Newcombe, F. N., Oldfield, R. C., & Wingfield, A. 1965. Object-naming by dysphasic patients. *Nature (London)*, **207**, 1217-1218.
- O'Connell, D. C., Kowal, S., & Hormann, H. 1969. Semantic determinants of pauses. *Psychologie Forschung*, **33**, 50-67.
- Pick, A. 1931. In A. Bethé (Ed.), *Handbuch der normalen und pathologischen Physiologie*, **15**(Part 2). Berlin: Springer. [Translated by J. W. Brown as *Aphasia*, by A. Pick, Springfield: Thomas (1973).]
- Rochester, S. R. 1973. The significance of pauses in spontaneous speech. *Journal of Psycholinguistic Research*, **2**, 51-81.
- Rochford, G. 1974. Are jargon dysphasics dysphasic? *British Journal of Disorders of Communication*, **9**, 35-44.
- ✓ Shallice, T., & Butterworth, B. 1977. Short-term memory impairment and spontaneous speech. *Neuropsychologia*, **15**, 729-735.
- Tannenbaum, P. H., Williams, F., & Hillier, C. S. 1965. Word predictability in the environments of hesitations. *Journal of Verbal Learning and Verbal Behavior*, **4**, 134-140.
- Weinstein, E. A., Lysterly, O. C., Cole, M., & Ozer, M. N. 1966. Meaning in jargon aphasia. *Cortex*, **2**, 165-187.
- Wernicke, C. 1874. *Der Aphasische Symptomencomplex*. Breslau: Cohn & Weigert. [Translated in A. Church (Ed.), *Modern clinical medicine*. New York: Appleton (1908).]
- ✓ Zangwill, O. L. 1960. Speech. *Handbook of Physiology-Neurophysiology III* (Chapter LXVII). Baltimore, Waverly Press.

Sent to everyone requesting, all in Vol-5 1st ed of 88, & ~~all~~ all acknowledged

+ Bogen, Requin, Bizzi

Kempen
Jarvela
Franklin