A pool of 1,086 words with unique two-letter fragments

JANET M. GIBSON and MICHAEL J. WATKINS
Rice University, Houston, Texas

Cognitive psychology is finding increasing use for the word fragment completion test, in which words have to be completed from a subset of their letters (e.g., *horizon* from --r-z--). Researchers often try to restrict their fragments to those that can be completed with only one word, but this is difficult to do and probably never has been achieved. To help resolve this problem, a list is provided of 1,086 three- to eight-letter words, each of which is uniquely specified by a two-letter fragment, where uniqueness is defined on the basis of two sizable word collections.

The word fragment completion test is playing an increasingly prominent role in experimental psychology. The test involves the completion of word fragments of the sort that occur in a partly solved crossword puzzle. For example, --r-z-- might be given as a test item for the target word *horizon*.

The increase in usage of this test is in part an expression of the general liberalization of research methodology that has come with the information processing revolution. A more particular cause is the keen interest that has recently sprung up in the facilitation of word perception that arises when the word is encountered beforehand. A prior encounter with a word has been found to enhance the facility with which it is read (Brooks, 1987; Johnston, Dark, & Jacoby, 1985; Kolers, 1976), the speed with which it is classified as a word rather than as a nonword (Carroll & Kirsner, 1982; Feustel, Shiffrin, & Salasoo, 1983), and the likelihood of its being identified from a tachistoscopic presentation (Jacoby, 1983; Jacoby & Dallas, 1981). These perceptual priming tests do not inquire whether the words were presented beforehand, and their results have shown perceptual priming even for words whose prior presentations are not recollected (Jacoby & Witherspoon, 1982; Tulving, Schacter, & Stark, 1982; Watkins & Gibson, in press). Although the word fragment procedure is sometimes (e.g., Horowitz, White, & Atwood, 1968; Nelson & McEvoy, 1979; Tulving & Watkins, 1973) used to cue recollection of prior occurrence ("complete the fragment with a word from the list just presented"), it is perhaps more often (e.g., Light, Singh, & Capps, 1986; Roediger & Blaxton, 1987; Tulving et al., 1982) used as another test of perceptual priming ("complete the fragment with a word").

The word fragment completion test has the advantage over other perceptual priming tests of being easy to administer. Also, it is a simple matter to create an ordinal scale of fragment completion difficulty. Thus, for a given

word length, a two-letter fragment (--r-z--) can be assumed to be more difficult to complete than a three-letter fragment (--r-zo-), which in turn can be assumed to be more difficult to complete than a four-letter fragment (-or-zo-), and so on. Although there are bound to be exceptions, such assumptions are likely to hold up in most cases, especially when the letters in the smaller fragments are retained as part of the larger fragments.

The word fragment completion test does, however, have a disadvantage. Unlike test items in other priming tests, a test item in a fragment completion test may allow more than one legitimate response. Such ambiguity may not be critical, but it will add noise. If only one response is allowed for each fragment, then to the extent that nontarget completions are given, the power to detect an effect of, say, prior study or fragment difficulty will be reduced. The problem could be alleviated by requiring as many valid completions as possible, but, because of inhibitory effects of output interference (Roediger, 1974), the problem would not be entirely eliminated. Also, requiring multiple completions might increase the needed response time, and thus decrease the efficiency of the experiment.

It is not surprising, then, that some researchers (e.g., Light et al., 1986; Peynircioğlu & Watkins, 1986; Tulving et al., 1982) have tried to restrict the words they use to ones having unique fragments. In general, this is immensely difficult to do (cf. Erickson, Gaffney, & Heath, 1987), and finding alternative completions to what researchers claim to be unique cues has developed into something of an underground sport. How can we determine whether, for example, --r-z-- is a fragment that uniquely specifies *horizon*? If and when we produce an alternative completion, we can be sure the fragment is not unique, but until then we cannot be sure either way.

One easy way of finding fragments that have only one completion is to confine consideration to those whose letters are all from the beginning of the word. These *word stem fragments*, as they are called, can easily be looked up in a dictionary to determine whether they submit, at least with respect to the entries in that dictionary, to alternative completions. We should note that it is not clear

This research was supported by National Institute of Mental Health Grant MH35873. Address correspondence to Michael J. Watkins, Department of Psychology, Rice University, Houston, TX 77251.

whether the way such fragments are completed is similar to the way nonstem fragments are completed (see Graf & Mandler, 1984; Graf, Squire, & Mandler, 1984; Greene, 1986; Nelson, Canas, Bajo, & Keelean, 1987). Also, as a cursory inspection of a dictionary will reveal, the number of such unique fragments is quite limited, at least for the more difficult (one-, two-, or even three-letter) levels.

In short, it would be useful to have for general use a pool of unique fragments unrestricted by letter location. The purpose of this article is to provide such a pool.

Method

Deriving the pool required a number of decisions. First, it was necessary to decide upon a source vocabulary, a set of words that we could use to operationalize the concept of unique fragment. One obvious possibility is the vocabulary of a regular dictionary. Unfortunately for our purposes, dictionaries typically omit inflectional word forms (e.g., *plays, played, playing; taller, tallest*), even though they may be highly familiar. Also, most dictionaries include many words that would not be known to the majority of subjects in a typical psychology experiment. Our purposes were better served by a vocabulary based directly on actual usage. Our first choice was the Brown Corpus, which was published originally as *Computational Analysis of Present-Day American English* (Kučera & Francis, 1967) and subsequently as *Frequency Analysis of English Usage: Lexicon and Grammar* (Francis & Kučera, 1982). Well known to experimental psychologists, the Brown Corpus is a collection of words obtained from 500 writing samples, each of around 2,000 words. The samples represent 15 genres, such as general fiction, romance, science fiction, humor, and religion. The Corpus includes approximately 50,000 different words.

The second decision was whether to include foreign words and proper nouns. On the one hand, such words might well come to mind in a fragment completion test even if, in compliance with instructions, they are not reported. On the other hand, there is likely to be little call for such words, for researchers usually screen them out in selecting their stimuli. We resolved this difficulty by including them when defining uniqueness but excluding them from our listing.

Third, we decided to restrict consideration to words consisting of no more than eight letters. Although longer words are more likely to include a unique fragment, they are seldom used in experimental research.

Our fourth decision concerned fragment size, that is, the number of letters included in the fragment. Small fragments have the advantage that they can be enlarged without endangering their uniqueness, whereas the same cannot be said of cutting down large fragments. For example, if the fragment *--p--b* is known to be unique, then the fragments *--pe-b*, *-upe-b*, and *supe-b* must also be unique; however, if *p-etry* is known to be unique, we cannot be sure that *p-et-y*, *p-e--y*, or *p-e---* is unique. Of course, the num-

ber of words with a unique *n*-letter fragment diminishes dramatically as *n* is reduced, and for a word pool to be useful it should be large enough to allow selection for frequency of usage, length, and other variables. A preliminary search turned up only a handful of words with unique one-letter fragments, and so we conducted a search for words with unique two-letter fragments.

With the specifications set, a computer search was conducted on tapes of the Francis and Kučera (1982) description of the Corpus.¹ Some words were found to have more than one unique fragment (e.g., *galaxy* is uniquely specified by *g---x-*, *-a---x-*, *--la--*, *---ax-*, and *----xy*); in these cases one fragment was selected at random. A casual inspection of the resulting pool revealed two problems. First, a nontrivial proportion of the fragments had alternative completions by words that are not included in the Corpus but are likely to be in the vocabulary of most subjects. For example, *-x-u--* could be completed by *exhume* as well as by *excuse*, and *gn--* by *gnaw* as well as by *gnat*. Second, and more conspicuously, quite a few of the words could reasonably be regarded as peculiar to the Corpus; some extreme examples are *sssshoo*, *whaddy*, *yehhh*, and *zoooop*. The alleviation of these two problems posed something of a dilemma: Reducing the number of fragments that would submit to an alternative completion required that the source vocabulary be increased, but reducing the number of "words" that were too rare to be of much interest to experimental psychologists required that it be decreased. To resolve this dilemma, we introduced a second source vocabulary, and defined a fragment as unique if it could be completed by only one word from either vocabulary, but included a word in our listing only if it occurred in both vocabularies. (We were able to retain a few of the words with fragments that could be completed by an alternative word from the second source by substituting what the computer search had designated as an alternative unique fragment.) By adopting two different criteria in this way, we reduced both the likelihood that our fragments would yield a legitimate unintended completion and the likelihood of listing a word that is too rare to be of use.

The second source vocabulary was the *Puzzle Solver's Handbook* (Corron, 1970), a collection of 18,003 words, ranging from two to eight letters in length. The book was sold by mail order as an aid in the solution of crossword puzzles. Although rarely cited, it has, to our knowledge, been used in more than one laboratory in which word completion research is conducted. The words are sorted by length, and within each length they are printed as many times as there are letters in the words, first alphabetically according to their first letters, second according to their second letters, and so on. This arrangement facilitates checking for fragment uniqueness. One of its shortcomings is its omission of many inflectional word forms. We therefore removed from our list as many words as we could find—and doubtless there were some we missed—with fragments that could also be completed by another

form of the same root word, provided the root word was included in the *Puzzle Solver's Handbook*.

As a final measure to reduce the number of fragments with a nontrivial chance of being given an alternative completion, we paid 12 graduate students from the psychology department of Rice University to try to complete the 1,203 word fragments that had survived until this stage. They were to spend approximately 6 sec on each, and were told that, although the task was so difficult they would not be able to think of even one completion for many of the fragments, if on occasion they thought of two completions they should write down both. A total of 117 fragments yielded legitimate alternative completions, and these fragments were discarded from the pool, leaving 1,086 in the final version. Note that we can give no guarantee that the fragments of the final pool will not produce unintended completions that happened not to be listed in either the Brown Corpus or the *Puzzle Solver's Handbook* and were not generated by our 12 reviewers. Of course, the probability of a legitimate alternative completion will reduce rapidly as the fragment size is increased by addition of more letters.

To summarize, each of the words listed in the Appendix (1) includes a two-letter fragment that, with place markers for the other letters, does not fit any other word from either the Brown Corpus or the *Puzzle Solver's Handbook* and was not given an alternative completion by any of 12 reviewers; (2) occurs in both the Brown Corpus and the *Puzzle Solver's Handbook*; (3) is not, according to Francis and Kučera (1982), exclusively a proper noun or foreign word; and (4) consists of no more than eight letters. The listing does not include two-letter words because these are, of course, all uniquely specified by two letters. The list comprises 1,086 words: 75 of three letters, 98 of four letters, 146 of five letters, 203 of six letters, 261 of seven letters, and 303 of eight letters. They are organized first by length and then alphabetically within each length. The two letters that, with place markers for the others, uniquely define the word are enlarged. Thus, *-b-n---* is a unique fragment for *abandon*. Each word is followed by a number, which specifies the frequency with which the word occurred in the approximately one-million-word count of the Brown Corpus, as given in the Kučera and Francis (1967) listing.

REFERENCES

- BROOKS, J. O., III. (1987). Enhancing and degrading visual stimuli. *Behavior Research Methods, Instruments, & Computers*, **19**, 260-269.
- CARROLL, M., & KIRSNER, K. (1982). Context and repetition effects in lexical decision and recognition memory. *Journal of Verbal Learning & Verbal Behavior*, **21**, 55-69.
- CORRON, D. R. (1970). *Puzzle solver's handbook*. Tucson, AZ: Author.
- ERICKSON, J. R., GAFFNEY, C. R., & HEATH, W. P. (1987). Difficulty and familiarity norms for 192 single-solution word fragments. *Behavior Research Methods, Instruments, & Computers*, **19**, 370-376.
- FEUSTEL, T. C., SHIFFRIN, R. M., & SALASOO, A. (1983). Episodic and lexical contributions to the repetition effect in word identification. *Journal of Experimental Psychology*, **112**, 306-346.
- FRANCIS, W. N., & KUČERA, H. (1982). *Frequency analysis of English usage: Lexicon and grammar*. Boston: Houghton Mifflin.
- GRAF, P., & MANDLER, G. (1984). Activation makes words more accessible, but not necessarily more retrievable. *Journal of Verbal Learning & Verbal Behavior*, **23**, 553-568.
- GRAF, P., SQUIRE, L. R., & MANDLER, G. (1984). The information that amnesic patients do not forget. *Journal of Experimental Psychology: Learning, Memory, & Cognition*, **10**, 164-178.
- GREENE, R. L. (1986). Word stems as cues in recall and completion tasks. *The Quarterly Journal of Experimental Psychology*, **38A**, 663-673.
- HOROWITZ, L. M., WHITE, M. A., & ATWOOD, D. W. (1968). Word fragments as aids to recall: The organization of a word. *Journal of Experimental Psychology*, **76**, 219-220.
- JACOBY, L. L. (1983). Perceptual enhancement: Persistent effects of an experience. *Journal of Experimental Psychology: Learning, Memory, & Cognition*, **9**, 21-38.
- JACOBY, L. L., & DALLAS, M. (1981). On the relationship between autobiographical memory and perceptual learning. *Journal of Experimental Psychology: General*, **110**, 306-340.
- JACOBY, L. L., & WITHERSPOON, D. (1982). Remembering without awareness. *Canadian Journal of Psychology*, **36**, 300-324.
- JOHNSTON, W., DARK, V., & JACOBY, L. L. (1985). Perceptual fluency and recognition judgments. *Journal of Experimental Psychology: Learning, Memory, & Cognition*, **11**, 3-11.
- KOLERS, P. (1976). Reading a year later. *Journal of Experimental Psychology: Human Learning & Memory*, **2**, 554-564.
- KUČERA, H., & FRANCIS, W. N. (1967). *Computational analysis of present-day American English*. Providence, RI: Brown University Press.
- LIGHT, L., SINGH, A., & CAPPS, J. (1986). Dissociation of memory and awareness in young and older adults. *Journal of Clinical & Experimental Neuropsychology*, **8**, 62-74.
- NELSON, D. L., CANAS, J. J., BAJO, M. T., & KEELEAN, P. D. (1987). Comparing word fragment completion and cued recall with letter cues. *Journal of Experimental Psychology: Learning, Memory, & Cognition*, **13**, 542-552.
- NELSON, D. L., & McEVOY, C. L. (1979). Encoding context and set size. *Journal of Experimental Psychology: Human Learning & Memory*, **5**, 292-314.
- PEYNIRCIOGLU, Z. F., & WATKINS, M. J. (1986). Cue depreciation: When word fragment completion is undermined by prior exposure to lesser fragments. *Journal of Experimental Psychology: Learning, Memory, & Cognition*, **12**, 426-431.
- ROEDIGER, H. L. (1974). Inhibitory effects of recall. *Memory & Cognition*, **2**, 261-296.
- ROEDIGER, H. L., & BLAXTON, T. A. (1987). Effects of varying modality, surface features, and retention interval on priming in word-fragment completion. *Memory & Cognition*, **15**, 379-388.
- TULVING, E., SCHACTER, D. L., & STARK, H. A. (1982). Priming effects in word-fragment completion are independent of recognition memory. *Journal of Experimental Psychology: Learning, Memory, & Cognition*, **8**, 336-342.
- TULVING, E., & WATKINS, M. J. (1973). Continuity between recall and recognition. *American Journal of Psychology*, **86**, 739-748.
- WATKINS, M. J., & GIBSON, J. M. (in press). On the relation between perceptual priming and recognition memory. *Journal of Experimental Psychology: Learning, Memory, & Cognition*.

NOTE

1. Words and word fragments used in this study have been selected, with permission, on the basis of information that was provided by W. Nelson Francis, Henry Kučera, and Houghton Mifflin Company and that appears in part in *Frequency Analysis of English Usage: Lexicon and Grammar* by W. Nelson Francis and Henry Kučera, 1982. Copyright 1982 by Houghton Mifflin Company.

APPENDIX
Words with Unique Two-Letter Fragments

Fragment uniqueness is defined on the basis of words that occur in the Brown Corpus (Francis & Kucera, 1982) or the Puzzle Solver's Handbook (Corron, 1970) or both; the unique fragment is indicated by enlarged letters. The words are arranged by length and alphabetically within length. The numbers refer to frequency of occurrence in the 1,014,232-word Brown Corpus. Additional details are given in the text.

Three-letter words

ACT 283	ADO 4	AFT 5	AGE 227	AIR 257	ANY 1345	ARC 41
ARM 94	ASK 128	ASS 5	ATE 16	AXE 6	BOO 1	BOW 15
BYE 2	CRY 48	DRY 68	EBB 1	EEL 2	EGG 12	EGO 13
ELK 1	ELM 3	END 10	ERR 1	FEW 601	FLU 8	HEX 2
ICY 12	ILL 39	INK 7	ION 6	ITS 1858	IVY 9	KEG 2
KID 61	KIT 2	MAY 1400	MOB 10	NAY 2	NIL 1	NOB 12
OAK 15	OIL 93	OLD 660	ONE 3292	ORB 1	OVA 1	OWN 772
PRO 16	PUB 1	REV 33	RYE 4	SAG 4	SKI 5	SKY 58
SLY 5	SPA 2	SPY 9	TEA 28	TRY 140	TWO 1412	URN 2
USE 589	VIA 48	VOW 2	WAR 464	WAX 14	WEB 6	WRY 5
YEA 3	YES 144	YET 419	YOU 3286	ZOO 9		

Four-letter words

ACID 13	AFAR 2	AGED 18	AGUE 1	AJAR 2	AKIN 10	ALTO 4
AMID 14	AMMO 4	ANTI 1	APEX 4	ARCH 13	ASKS 18	ATOP 6
AVID 1	AWRY 2	AXLE 5	BLOC 10	BUFF 5	BUZZ 13	CASH 36
CHEF 9	CHIC 7	COZY 1	CZAR 1	DAYS 384	DEBT 13	DISC 6
EATS 3	ECHO 10	EDIT 2	EGGS 35	ENVY 7	ERRS 1	EXIT 7
FISH 35	FIVE 286	HERB 7	JAZZ 99	JINX 1	JOYS 7	KEGS 1
KEYS 34	KHAN 2	KIDS 32	KISS 17	LAYS 6	MOVE 171	MYTH 35
NEXT 394	NORM 10	NOUN 1	NUMB 4	OAFS 1	OAKS 1	OKAY 20
ONLY 1747	OWLS 2	PAVE 2	PAYS 17	PUFF 1	PYRE 1	QUIT 15
QUIZ 2	RAKE 11	RARE 41	RAYS 9	SIGN 94	SKIP 5	SKIS 1
SKIT 1	STAG 8	STAY 113	STUD 7	SWAP 2	SWUM 1	TOYS 11
UGLY 21	UNIT 103	UNTO 16	UPON 495	UREA 1	URGE 21	URNS 2
USED 612	VAMP 1	VERB 4	VIEW 186	VOWS 5	WAXY 2	WHIZ 2
WOMB 1	YARD 35	YELP 2	YOUR 923	ZEAL 8	ZERO 24	ZINC 10

Five-letter words

ABACK 2	ABIDE 7	ABOUT 1815	ABOVE 296	ACIDS 7	ADAGE 3
ADobe 2	AFFIX 1	AFIRE 1	AFOOT 1	AGENT 44	AGING 4
AGONY 9	ALBUM 6	ALIBI 8	AMAZE 3	AMONG 370	ANKLE 8
ANNEX 1	ANTIC 1	AORTA 3	ASIDE 67	ASKED 398	ASKEW 1
AVAIL 4	AWFUL 17	AXIAL 2	AXIOM 1	BANJO 2	BUOYS 1
CHAOS 17	CLIMB 12	COZEN 1	CROWD 53	DEBTS 12	DEPTH 53
DIZZY 5	DOUBT 114	DROOP 1	DWARF 3	EBONY 3	ECLAT 1

APPENDIX (Continued)

EERIE 2	EIGHT 104	EJECT 1	ELFIN 1	EMCEE 1	ENDOW 2
ENJOY 44	EPOCH 6	EQUAL 90	ETHYL 4	EVADe 1	EVoKE 6
EXACT 27	EXCEL 1	EXERT 11	EXIST 59	EXITs 1	EXPEL 2
EXTRA 50	EYING 2	FLUFF 1	FLUKE 1	FRANC 1	GREEK 61
GYPsY 4	HAVOC 3	HIGHs 2	INDEX 81	IRATE 1	IRISH 28
ISsUE 152	JAZZY 1	JEANS 1	JIFy 2	JIMMY 11	KHAKI 1
KICKs 3	LATEX 2	MAUVE 1	MAYBE 134	MOTIF 8	MYRRH 2
OBEYs 1	OFFAL 1	OFTEN 368	OHMIC 1	OLIVE 5	OUNCE 3
OUTDO 3	OWING 3	OZONE 3	PIQUE 2	PLUMB 5	PSALM 4
QUAKE 2	QUEER 6	QUERY 1	QUOTA 4	RABBI 13	RADIi 4
RAJAH 1	RELAX 19	RENEW 4	RIFLE 63	SCREW 21	SCRUB 9
SEIZE 6	SHEIK 4	SHRUG 2	SIEVE 1	SIXTH 26	SKIFF 9
SKIPs 5	SKIRT 21	SLYLY 2	SPASM 3	SPOOF 1	SPUME 1
SQUAT 7	SQUAW 1	SWARM 3	SWIFT 32	SWUNG 48	SYRUP 4
TOXIC 3	TWICE 74	ULCER 5	UNIFY 2	USAGE 14	USHER 2
USING 145	USUAL 96	VERBs 7	VIEWS 51	VINYL 4	VYING 3
WIDTH 14	XENON 1	XYLEM 4	YEAST 3	YOUNG 385	YUCCA 1
ZEBRA 1	ZEROS 2				

Six-letter words

ABLAZE 3	ABROAD 51	ABRUPT 18	ABSORB 13	ADHERE 4	ADRIFT 1
ADVERB 1	AFFAIR 33	AFFIRM 12	AFGHAN 3	AFIELD 1	AFLAME 3
AGENCY 56	AGENDA 5	AGHAST 1	AGLEAM 1	AGREED 81	ALBUMS 2
ALKALI 4	ALUMNI 9	ALWAYS 458	ANSWER 44	APLOMB 1	ARROWS 6
ASKING 67	ASLEEP 29	ASSIGN 18	ASTHMA 1	AVENGE 2	AVENUE 46
AVIARY 1	AXIOMS 2	AZALEA 2	BAZAAR 7	BEHALF 21	BEHAVE 13
BOGEYS 2	BOXCAR 6	BUREAU 43	CATKIN 2	CLIMAX 14	COGNAC 4
COWBOY 16	CROWDS 12	CUPFUL 3	CUTOFF 1	DAYBED 1	DELUXE 2
DEPTHS 19	DISOWN 1	DREAMT 1	DUPLEX 1	DWARFS 2	DYNAMO 2
EDITOR 77	EIGHTH 23	ELBOWS 7	ELEVEN 40	EMBRYO 1	ENDOWS 1
ENGAGE 14	ENJOYS 10	ENZyme 6	EQUITy 7	ESCHEW 1	ETHNIC 13
EVOLVE 5	EXEMPT 5	EXISTS 42	EXODUS 4	EXOTIC 7	EXPECT 108
EXTRAS 1	FILLIP 1	FOLKSY 3	FORAYS 1	GADFLY 3	GALAXY 3
GROWTH 155	HEREBY 8	HEROIC 21	HOMAGE 2	HYBRID 1	ICEBOX 3
ICICLE 1	IDIOMS 3	IMBiBE 1	INDIGO 1	INFLOW 2	INFLUX 4
INJURY 27	INWARD 9	IODIDE 8	ITSELF 304	JOYFUL 1	LAWFUL 2
LEGUME 2	LENGTH 116	LIQUOR 43	LUMMOX 1	MATRIX 1	MILIEU 4
MOSAIC 4	MOTIVE 22	NATIVE 46	NEARBY 44	NOTIFY 8	NUTMEG 4
NYMPHS 1	OBEYED 7	OBLIGE 1	OBOIST 1	OBTAIN 42	OCCUPY 16
ODIOUS 3	OFFERS 45	OFFSET 9	OMELET 3	OPAQUE 6	OSSIIFY 1
OTHERS 323	OUTFOX 1	OUTLAW 2	OUTPUT 35	OUTWIT 1	OXIDES 1
OXYGEN 43	PAYOFF 1	PIAZZA 17	PICNIC 15	PLAQUE 2	PREFAB 1
PUZZLE 10	PYTHON 14	QUAINT 12	QUALMS 1	QUARTZ 1	RAKISH 1
REBUFF 4	REBUKE 2	REMOVE 58	REVIEW 56	REVIVE 8	REVVED 1
RHYTHM 22	RUNOFF 2	RUNWAY 4	SCHISM 1	SEQUEL 1	SEWAGE 29
SEXTET 4	SHADOW 36	SHREWD 8	SKETCH 16	SKIRTS 4	SMACKS 1

APPENDIX (Continued)

SPRAYs 1	SPYING 2	SQUASH 2	STAYED 75	STRAYs 6	STUCCO 4
SUPERB 14	SVELTE 1	SWARMS 1	SWIVEL 5	SYNTAX 6	TALLOW 1
TAVERN 2	TAXIED 1	THUMBS 3	THWACK 1	TORQUE 5	TRAGIC 33
UNEVEN 6	UNIQUE 58	UNJUST 3	UNKIND 3	UPBEAT 1	UPDATE 1
UPKEEP 6	UPSHOT 1	UPTOWN 5	USABLE 8	USAGES 3	USEFUL 58
UTMOST 7	UTOPIA 24	VACUUM 20	VANISH 5	VEERED 3	VIVIFY 1
VOTIVE 2	WARMTH 28	WIDTHS 5	WINNOW 1	WISDOM 44	YACHTS 3
YONDER 1	YOUTHS 11	ZEALOT 1	ZOMBIE 1	ZOUNDS 2	

Seven-letter words

ABANDON 17	ABOLISH 8	ABOUNDS 1	ABREAST 5	ABSENCE 53
ABSORBS 1	ABYSMAL 2	ACHIEVE 51	ACOLYTE 1	ADDICTS 4
ADJUNCT 6	ADRENAL 2	ADSORBS 1	ADVERBS 2	AFFIRMS 1
AFFRONT 2	AFRICAN 28	AGAINST 626	ALCOHOL 13	ALLEGRO 2
AMONGST 4	AMPLIFY 1	ANALYST 7	ANTIQUE 12	APPROVE 14
APROPOS 1	AQUEOUS 14	ARCHAIC 5	ARMHOLE 3	ARRAYED 2
ASCRIBE 1	ASEPTIC 1	ASKANCE 1	ASPECTS 64	ASSIGNS 4
ASUNDER 1	ATHLETE 9	AVIATOR 3	AVOCADO 11	AWFULLY 10
AWKWARD 11	AWNINGS 2	BAGPIPE 1	BATHTUB 4	BEDTIME 4
BENEFIT 63	BEQUEST 5	BETRAYS 3	BICYCLE 5	BIVOUAC 5
BRAVURA 1	BREADTH 7	BUFFALO 16	CADENZA 3	CALYPSO 1
CARAWAY 2	CASHEWS 1	CHAOTIC 5	CITIZEN 1	COAXING 1
COBWEBS 1	CONTEXT 35	COWBOYS 4	CZARINA 2	DEFYING 2
DISGUST 1	DISROBE 1	DISTURB 10	DOORWAY 15	DOWAGER 1
ECHOING 2	ECSTASY 6	EDITING 5	EDUCATE 7	EGGHEAD 1
EGOTISM 3	EJECTED 2	ELEGIAC 2	ELUSIVE 2	EMBARGO 2
EMPOWER 1	ENZYMES 11	EPITOME 2	ESCHEWS 1	EVASIVE 5
EVINCED 1	EXCERPT 6	EXCLAIM 1	EXISTED 40	EXPECTS 22
EXPLAIN 64	EXPLORE 12	EXPUNGE 1	EYEBROW 4	FILMDOM 1
FORSAKE 1	FRANTIC 11	FRIDAYS 3	FUCHSIA 1	GAZETTE 10
GODLIKE 1	GROWTHS 1	GUFFAWS 1	HACKSAW 1	HALCYON 1
HALFWAY 18	HEBRAIC 1	HELPFUL 29	HEXAGON 1	HIGHBOY 1
HIGHWAY 40	HIMSELF 603	HOPEFUL 12	HORIZON 27	HUZZAHS 1
HYDROUS 1	IDOLIZE 1	IDYLLIC 4	IGNEOUS 1	IMPACTS 3
IMPROVE 39	INEXACT 2	INFIDEL 1	INSIGHT 22	INSIPID 1
IRKSOME 1	ISOMERS 1	ISRAELI 4	ISSUING 4	JOYRIDE 2
JUSTIFY 26	KICKOFF 2	KIDNEYS 5	KINDRED 3	KINETIC 8
KINGDOM 26	KINGPIN 1	KNUCKLE 3	LACKEYS 1	LACQUER 2
LAWYERS 23	LAYOFFS 1	LEISURE 11	LIQUEUR 1	LIQUIDS 6
MAJESTY 1	MARVELS 1	MAWKISH 1	MAXIMUM 79	MAZURKA 2
MIDWIFE 1	MODICUM 2	MOVABLE 19	MYSTICS 3	NEPHEWS 5
NEWSBOY 2	NONSTOP 1	NULLIFY 1	OBELISK 6	OBSURE 17
ODYSSEY 11	OFFBEAT 1	OFFHAND 1	ONESELF 5	ONWARDS 1
ORGASMS 1	OUTLAYS 1	OVATION 2	OXYGENS 3	PAPRIKA 2
PARADOX 9	PERFUME 10	PERJURY 3	PENNIG 1	PIGSKIN 1
PIQUANT 2	PLATEAU 3	PLAYFUL 3	POLYMER 1	PRETEXT 3

APPENDIX (Continued)

PREVIEW 1	PROJECT 93	PROVERB 5	PROVOKE 3	PSYCHIC 3
QUALIFY 15	QUIBBLE 1	QUICKEN 1	RAINBOW 4	REDCOAT 6
REFUGEE 7	RELAYED 2	REMARKS 53	RENEWAL 8	REPROOF 1
REVIEWS 9	ROOFTOP 2	ROUNDUP 3	RUNAWAY 6	RUNWAYS 4
SATISFY 16	SAWMILL 1	SAYINGS 1	SCARIFY 1	SCRAWNY 4
SHERIFF 20	SHRINKS 2	SKILFUL 1	SOJOURN 5	SOMEHOW 72
SPEEDUP 1	SQUEEZE 11	STANDBY 3	STAYING 17	STIMULI 5
STYLISH 2	SUBMITS 3	SUBWAYS 1	SUCCUMB 1	SURVIVE 33
SWALLOW 10	SWARTHY 4	SWIVELS 1	SYMPTOM 5	TABEAU 1
TAFETA 2	TAKEOFF 1	TALLYHO 7	TAXICAB 1	TRAFFIC 68
TRAMWAY 1	TRIUMPH 22	TURNIPS 1	TWELFTH 5	TWINKLE 3
UNDERGO 8	UNDYING 1	UNEQUAL 1	UNHAPPY 26	UNKEMPT 1
UNKNOWN 47	UNLOCKS 2	UNSCREW 1	UPGRADE 3	UPRIGHT 14
UPWARDS 6	URANIUM 6	URETHRA 1	VALLEYS 5	Vaquero 1
VARYING 42	VEHICLE 35	VENISON 1	WAKEFUL 5	WALNUTS 5
WARLIKE 5	WAYSIDE 2	WROUGHT 3	YAWNING 2	YIDDISH 4
ZOOMING 1				

Eight-letter words

ABEYANCE 3	ABNORMAL 3	ABSINTHE 1	ABUNDANT 9	ACCOLADE 2
ADEQUACY 3	ADJOINED 2	ADJOURNS 1	ADSORBED 3	AFFINITY 5
AFFORDED 11	AGENCIES 62	AGRARIAN 8	AGREEING 7	AIRCRAFT 70
AIRSTRIIP 2	ALCOHOLS 2	ALFRESCO 2	AMORTIZE 2	ANALYSTS 6
ANECDOTE 9	ANTIQUES 3	APPENDIX 10	APPROACH 123	ARMCHAIR 4
ASBESTOS 1	ATHEISTS 3	BABYHOOD 1	BALLYHO 1	BANKRUPT 5
BAPTISMS 1	BEAUTIFY 1	BELLBOYS 4	BERIBERI 2	BESTOWAL 4
BLIZZARD 7	BOOMTOWN 1	BOUQUETS 1	BRAZENLY 1	BROCCOLI 1
BULLDOZE 1	BUNGALOW 1	CHERUBIM 1	CHIMNEYS 3	CITIZENS 86
CLASSIFY 6	CLEAVAGE 2	CLIMAXED 2	COCKEYED 1	COERCIVE 2
COLLOQUY 1	COMFORTS 5	CONDEMN 3	CONJUGAL 3	CONJURED 2
CONTEXTS 2	CONTRIVE 1	CONVULSE 3	COXCOMBS 1	CRUCIFIX 3
CYLINDER 18	DESCRIBE 41	DEWDROPS 1	DISCOVER 40	DISFAVOR 1
DISMAYED 1	DISPLAYS 21	DISRUPTS 1	DISSOLVE 6	DIVISIVE 5
DOORKNOB 3	DOWNBEAT 1	DOWNCAST 2	DOWNFALL 5	DOWNTOWN 41
DRAWBACK 2	DREADFUL 10	DRIVEWAY 14	EDITIONS 10	EFFUSIVE 1
EGGSHELL 1	EGYPTIAN 5	ELBOWING 1	ELEVENTH 4	EMBARKED 2
EMBEZZLE 1	EMERALDS 6	EPIGRAMS 2	EQUALITY 12	EQUALIZE 1
EQUATING 1	ESSENCES 2	EUPHORIA 2	EVASIONS 1	EVENINGS 15
EVERYDAY 12	EVIDENCE 204	EXCERPTS 5	EXCHANGE 70	EXCLAIMS 1
EXCURSUS 1	EXHAUSTS 1	EXHIBITS 16	EXPERTLY 2	EXPOSURE 25
EXTERNAL 43	EYEBROWS 9	FIFTIETH 1	FLEXIBLE 25	FORENSIC 7
FREQUENT 34	FRUITFUL 7	GALAXIES 7	GALVANIC 2	GATEWAYS 1
GAZETTES 1	GNASHING 2	HALFBACK 10	HALFWAYS 1	HARDTACK 3
HATCHWAY 2	HEADACHE 5	HECATOMB 1	HEMLOCKS 1	HOLIDAYS 12
HORIZONS 6	HUMANIZE 2	HYACINTH 1	IDENTIFY 26	IDEOLOGY 13
IDLENESS 3	IMPLYING 7	IMPROPER 2	INDEBTED 10	INEXPERT 1

APPENDIX (Continued)

INFAMOUS 4	INNOVATE 1	INVALIDS 1	INWARDLY 3	ISOTOPIC 2
JACKDAWS 1	JAPANESE 53	JEALOUSY 4	JEOPARDY 4	JOLLYING 1
JOURNES 2	JOYFULLY 1	JUDICIAL 16	KERCHIEF 1	LAVENDER 5
LAYERING 2	LEUKEMIA 3	LIBRETTO 2	LIFELIKE 3	LIETIME 10
LIKENESS 3	LOGISTIC 2	LUKEWARM 5	MACKINAW 1	MAGAZINE 39
MAHOGANY 8	MAJESTIC 10	MANDAMUS 1	MANEUVER 5	MAVERICK 3
MAXIMUMS 2	MIDNIGHT 23	MYSTIQUE 5	NARROWLY 6	NAVIGATE 1
NEEDLESS 11	NEWCOMER 7	NEWLYWED 1	NEWSREEL 1	NOWADAYS 12
NUMBNESS 2	OBEYDIENT 2	OFFENCES 1	OFFERING 28	OFFICIAL 75
OFFSTAGE 1	ONLOOKER 2	OPERATIC 5	ORTHODOX 19	OUTCOMES 11
OUTLAWRY 1	OUTLYING 2	OUTWEIGH 2	OVERFLOW 2	OVERLAPS 1
OVERSIZE 2	OVERTAKE 3	PARADIGM 6	PARALYZE 1	PASSERBY 1
PAWNSHOP 3	PEACOCKS 4	PELLAGRA 1	PHYSIQUE 2	PICAYUNE 1
POWERFUL 63	PREMIUMS 2	PREVIOUS 86	PRIMEVAL 5	PROBLEMS 247
PROHIBIT 2	PROJECTS 68	PROVERBS 1	PYORRHEA 1	QUAGMIRE 1
QUERYING 1	QUIXOTIC 2	RAINDROP 2	RAKISHLY 1	REBUFFED 4
REFLEXLY 2	REMAKING 1	REPRIEVE 2	REPUBLIC 43	RHYTHMIC 11
RIGHTFUL 4	RIGIDITY 2	ROADWAYS 1	ROOFTOPS 1	ROUNDUPS 1
SARCASMS 1	SCHEDULE 36	SCISSORS 1	SEQUENCE 35	SEXUALLY 6
SHADOWED 3	SHAMEFUL 2	SHAMROCK 3	SHRAPNEL 2	SHREWDLY 2
SHRUGGED 18	SIDEWAYS 3	SIGNPOST 2	SIMPLIFY 9	SKELETON 2
SKIDDING 2	SKULLCAP 3	SKYLIGHT 1	SMALLPOX 2	SOMEWHAT 127
SPAVINED 1	SQUARELY 11	SQUIRMED 2	SQUIRREL 1	STACCATO 5
STOICISM 5	STRENGTH 136	STUDYING 40	SUBJECTS 81	SURVIVAL 32
SUZERAIN 2	SWALLOWS 2	SWEETISH 1	TAKEOFFS 2	TAXPAYER 11
TEXTBOOK 4	TEXTILES 15	THANKFUL 6	THEORIZE 2	THWARTED 4
TOGETHER 267	TOMORROW 63	TOWNSHIP 7	TRANQUIL 2	TRAPDOOR 1
TRIPTYCH 2	TWILIGHT 4	UGLINESS 7	UNCOMMON 8	UNDERTOW 1
UNGLAZED 1	UNKNOWN 1	UNLAWFUL 1	UNLIKELY 21	UPCOMING 1
USEFULLY 1	VACUUMED 1	VAGABOND 2	VERMOUTH 1	VINEYARD 2
VOLCANIC 2	WAKENING 1	WALKOVER 1	WALKWAYS 1	WARDROBE 8
WASHBOWL 1	WATCHFUL 2	WAXWORKS 1	WHATEVER 112	WHIZZING 1
WOUNDING 1	WRONGFUL 1	YEARBOOK 2	YELLOWED 1	YOUNGISH 2
YOURSELF 67	YUGOSLAV 7	ZODIACAL 3		

(Manuscript received December 31, 1987;
revision accepted for publication March 18, 1988.)