NOTE

Heteropalindromes

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Strings of letters that form words when read both forward and backward (e.g., "deliver" and "reviled") are termed heteropalindromes. They may be used in both reading research and memory retrieval research. A list of English heteropalindromes that approaches comprehensiveness is reported.

As experimentation in cognition has increased in subtlety, a variety of classes of words with special properties have found increasing use (see Brown, 1976). Members of a further potentially useful class are listed here. A word that reads the same forward and backward (e.g., "noon") is termed a palindrome. Symbols that form different words when read forward and backward (e.g., "gnat" and "tang") may be termed heteropalindromes (from the Greek for "different running back").

A considerable number of studies of the effects of a range of different geometrical transformations upon ease of reading have been carried out, and it is anticipated that heteropalindromes may be of primary application in this area (e.g., see Wickelgren, 1979, p. 154). Words of this class have in fact been used by Asso and Wyke (1967). They may also be of use in memory research to provide (upon reversal) unexpected retrieval cues akin to those used by Gardiner, Craik, and Birtwistle (1972). It was for this reason that the present collection was formed (cf. Jones, 1978, 1979). It is intended to be as comprehensive as possible, in order to clarify experimental stimulus sampling (see Clark, 1973; Wike & Church, 1976).

METHOD

The corpus of heteropalindromes was compiled over a period of several months, using as principal systematic aids exhaustive permutations of sets of three and four letters, consideration of the phonological and morphemic structure of English for longer words, and dictionary scanning. Proper names such as "Edam" (cheese) or "Strad" (violin) are not included. The dictionary consulted was *Chambers Twentieth Century Dictionary*. Note that it appears necessary to use heuristic rather than algorithmic methods. Even if it were computationally possible to examine the entire contents of a dictionary for heteropalindromes, this method would fail to detect many inflected words such as "lived" or "peels."

In all, 145 heteropalindromes are listed in Table 1: 3 two-letter, 36 three-letter, 62 four-letter, 31 five-letter, 11 six-letter, and 2 seven-letter strings. They are arranged in Table 1 by

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length and alphabetically, with the two forms arranged alphabetically in each case. Asso and Wyke (1967) used 22 heteropalindromes, but they only cited 2 as examples. The present list is not completely comprehensive, but it includes a suffi-

Table 1
List of English Heteropalindromes

Two-Letter Words		
eh-he	em-me	no-on
Three-Letter Words		
are-era	dew-wed	pat-tap
bad-dab	dog-god	pay-yap
bag-gab	don-nod	per-rep
ban-nab	eel-lee	pit-tip
bat-tab	gum-mug	pot-top
bed-deb	lap-pal	pus-sup
bin-nib	mar-ram	put-tup
bog-gob	may-yam	rat-tar
bud-dub	now-won	raw-war
bun-nub	nut-tun	rot-tor
but-tub	par-rap	saw-was
dam-mad	pas-sap	way-yaw
Four-Letter Words		
abut-tuba	evil-live	moor-room
ante-etna	feer-reef	naps-span
auks-skua	flog-golf	nips-spin
bats-stab	flow-wolf	nuts-stun
blub-bulb	gnar-rang	pals-slap
brag-garb	gnat-tang	pans-snap
bunk-knub	gnus-sung	part-trap
buns-snub	gums-smug	pats-stap
butts-stub	guns-snug	paws-swap
dart-trad	keel-leek	pets-step
deem-meed	knar-rank	pins-snip
deer-reed	knit-tink	pots-stop
dens-sned	lair-rial	raps-spar
dial-laid	leer-reel	rats-star
doom-mood	lees-seel	spat-taps
door-rood	liar-rail	spay-yaps
draw-ward	loop-pool	spit-tips
edit-tide	loot-tool	spot-tops
emir-rime	mart-tram	stew-wets
emit-time	maws-swam	sway-yaws
ergo-ogre	meet-teem	
Five-Letter Words		
aider-redia	lever-revel	remit-timer
depot-toped	loops-spool	reput-toper
devil-lived	loots-stool	smart-trams
draws-sward	notes-seton	snaps-spans
fires-serif	pacer-recap	snips-spins
gnats-stang	parts-strap	spart-traps
keels-sleek	peels-sleep	spirt-trips
knaps-spank	pools-sloop	spots-stops
knits-stink	ports-strop	straw-warts
lager-regal	rager-regar	
leper-repel	rebut-tuber	
Six-Letter Words		
diaper-repaid	reflow-wolfer	spirits-strips
drawer-reward	rennet-renner	sports-strops
looter-retool	secret-terces	sprits-stirps
redraw-warder	sloops-spoils	
Seven-Letter Words		
deliver-reviled	reliver-reviler	

ciently high proportion of the total possible number of exemplars to be of equivalent use.

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