SHIFTGRAMS REVISITED

DARRYL FRANCIS
Sutton, Surrey, England
darrylfrancis@yahoo.co.uk

The concept of word-shifts was introduced in Dmitri Borgmann's *Language on Vacation* (1965). Consider the word COLD for instance. Shifting each of the letters three spaces forward in the alphabet, COLD becomes FROG; and shifting the letters of CHEER seven spaces forward produces JOLLY. Dmitri offered many other examples in his book.

Dmitri revisited the subject in the February 1969 issue of Word Ways, and extended the concept of word-shifts to shiftgrams. He wrote "If every shift of a word is regarded as a possible scrambled word, the possibilities of generating words by shifting are considerably augmented ... an example will make this clear." He then gave the example of the letters of MUSIC being shifted eight places forward in the alphabet, creating the sequence UCAQK, and then rearranging this to make the word QUACK. The longest example Dmitri offered in his article was ANGELIC to PECKING.

There the subject of shiftgrams remained until Tom Pulliam's February 1980 Word Ways article. Tom offered a plethora of eight- and nine-letter examples. I particularly liked WISHBONE to QUANTIZE and PLASTERED to SPAGHETTI (although the latter appeared in Tom's article as DEPLASTER to SPAGHETTI).

Dmitri offered a ten-letter shiftgram in Colloquy of the May 1980 Word Ways: OVERLEANED to VIZIERSHIP. Editor Ross Eckler opined that twelve-letter shiftgrams existed, but no examples appear to have been located.

Rather than just attempting to add further shiftgrams to those already discovered, I wondered to what extent any logical group of words could be shiftgrammed. Seven lists follow: cardinal numbers, chemical elements, colors, letters of the Greek alphabet, US statenames, days of the week, and planets of the solar system.

Is there some way of predicting an approximate number of shiftgrams that can be produced from a given set of words? The number of shiftgrams is probably a function of the number of words in the given set, or more likely a function of the number of two-letter words in the set, a weaker function of the number of three-letter words, a still weaker function of the number of four-letter words, and so on. It's far more likely that the set of two- and three-letter words allowed in Scrabble will produce more shiftgrams than the set of fourteen- and fifteen-letter words ending in NESS. The number of shiftgrams is probably also a function of the size of the vocabulary from which shiftgrams are validated. Put simply, there are likely to be more shiftgrams found using Webster's Third than a pocket dictionary. Anyone care to put together a statistical formula predicting the probable number of shiftgrams from a set of words with a given set of properties?

In the following lists, asterisks have been used to indicate word-shifts, those special instances of shiftgrams requiring no rearrangement of letters. The source for most shiftgram words in the following lists is Official Scrabble Words International, with some additional words (marked accordingly) from Webster's Second and Webster's Third Editions (W2,W3), the Oxford English

Dictionary (OED), the New Oxford Dictionary of English (NODE), and the Random House Dictionary (RHD).

Cardinal Numbers

The number ONE is the most fecund producer of shiftgrams, with eight different shift sizes. I am surprised that TEN wasn't slightly more productive.

ONE 1 fop, 4 sir, 7 luv, 10 oxy, 13 bar* bra, 16 due, 21 jiz*, 22 jak
TWO 4 sax, 6 cuz, 8 web, 15 lid, 18 log*, 21 jor, 24 rum*
THREE 7 alloy loyal, 10 boord brood, 13 regur urger, 22 panda
FOUR 12 grad drag
FIVE 9 oner rone, 10 fops, 19 boxy, 22 bare bear brae, 25 hued
SIX 3 lav, 6 yod, 11 dit tid, 12 jeu, 16 yin, 22 toe
SEVEN 4 wizir (OED), 13 friar
EIGHT 7 nopal, 11 perst perts prest strep, 22 caped paced
NINE 7 pulu, 11 typy, 13 vara, 18 waff
TEN 1 fou ufo, 11 pye yep, 13 gar rag, 15 cit tic, 16 jud, 22 jap
TWELVE 22 A-sharp (W2) Sharpa (OED)
THIRTY 11 ejects, 21 dotcom (The Dotcom Dictionary) tomcod
FORTY 15 duing
FIFTY 25 hexes
SIXTY 6 dozey (OED), 21 stond

Chemical Elements

GOLD and XENON produce shiftgrams for four different shift sizes. The longest shiftgrams, at seven letters, are generated by CAESIUM, HAFNIUM, SULPHUR and TERBIUM.

ARGON 17 fixer refix
BARIUM 18 jetsam matjes
BORON 16 heder, 17 fifes
CAESIUM 16 quicky's (OED, possessive form of quicky)
CARBON 17 freits refits resift rifest sifter strife
CERIUM 10 embows
ERBIUM 10 belows blowse bowels elbows
GOLD 1 hemp, 8 lowt, 20 faix, 23 dali dial laid
HAFNIUM 6 alongst
HELIUM 6 Akrons (places called Akron, RHD), 10 vowers
IRON 23 folk*
LEAD 8 milt, 11 plow, 15 apts past pats spat stap taps
NEON 13 arba* Arab (W3), 16 dude dued*
OXYGEN 16 unowed
RADON 5 swift
SILVER 9 unbare unbear urbane, 13 verify
SODIUM 16 tickey
SULPHUR 23 primero*
TERBIUM 10 blowsed
TIN 11 tye yet, 17 zek
XENON 1 poofy, 4 birrs, 13 kabar, 16 nuded * (OED)
ZINC 5 hens nesh, 13 vamp, 18 frau

Colors

Apart from the seven colors of the rainbow, a list of colors is slightly more flexible than a list of chemical elements or US statenames. The following list starts with the colors of the rainbow in the traditional ROYGBIV order. All seven colors are able to produce shiftgrams. Then follows a list of other colors, from AMBER to WHITE. There are many other more obscure color names that could be used to extend the list.

The longest shiftgrams are the seven-letter CELADON and OPALINE. DUN has nine different shifts, more than any other color. Note the color pairs ANIL navy, ROAN limy and OLIVE bluey. GARNET has a thirteen shift into itself!

RED 1 efs, 3 hug, 9 man mna nam, 10 bon* nob, 11 cop, 16 hut*, 23 abo boa oba*
ORANGE 4 skiver, 13 banter barnet (NODE)
YELLOW 14 taland (OED)
GREEN 1 hoffs (OED,W2), 13 arret rater tarre terra*
BLUE 6 hark, 7 libs, 9 dunk, 10 levo love vole, 14 zips, 16 burk
INDIGO 22 phreak
VIOLET 3 whorly (W3)

AMBER 13 zoner
ANATTO 4 Xerxes (RHD)
ANIL 4 perm, 6 grot trog, 7 hups* push, 13 navy, 18 fads
APPLE 4 petit petti, 15 etape
AQUA 10 ekka, 18 miss sims
AUBURN 17 rilles siller
AZURE 14 finos foins infos
BICE 6 hoik* hoki, 10 mols olms
BLACK 18 ducts, 19 duvet, 24 jizya (W3)
BROWN 17 fenis fines neifs niefs nifes
BUTTER 10 boddle bolded (W3), 13 hogger
CANARY 2 accept, 13 pennal
CELADON 4 griphes (OED,W2)
CERISE 10 coombs combos
CYAN 2 cape pace, 6 geit gite tige, 13 plan, 17 pert, 24 waly yawl
DUN 1 voe, 4 rhy, 6 taj, 11 foy, 14 rib*, 17 leu ule*, 20 hox, 21 yip, 23 ark
EBON 13 boar bora, 16 dure rude rued urde, 25 damn mand
ECRU 9 land, 16 husk sukh, 20 owly yowl, 24 caps* pacs
FAWN 8 nevi vein vine, 17 wren, 21 riva vair, 24 duly
GARNET 13 garnet
GRAPE 13 fouds
GRAY 13 lent, 20 saul
GREY 2 gait, 14 fums, 20 lays slay
HENNA 13 ruana, 17 every veery
IVORY 3 burly, 13 blive, 16 holey hoyle, 20 clips, 22 unker (OED)
JET 4 nix, 5 joy, 10 dot tod*, 22 fap*, 25 dis ids*
KHAKI 10 kurus
LAKE 8 mist smit, 16 quab (OED,W2)
LEMON 6 turks, 16 cubed
LILAC 3 flood, 18 dauds duads

LIME 2 gonk, 3 holp, 6 kors roks, 19 vows, 18 awed deaw wade
MAROON 17 differ riffed
MAUVE 8 mucid, 14 jiaos
NILE 4 prim, 6 tork* (OED), 7 plus puls, 13 vary
OCHER 22 kandy
OLIVE 16 bluey, 18 dwang, 22 haker (OED)
OPALINE 4 imprest permits
ORLEAN 4 vipers, 13 barney nearby
PEACH 4 gelit legit, 11 plans, 15 twerp, 24 fancy
PEARL 7 hwyls, 15 Paget (OED,RHD), 23 imbox (OED,W2)
PINK 4 mort, 5 puns spun, 16 fady, 24 ling
PRIVET 9 carney, 22 planer replan
PUCE 2 grew, 6 kiva, 10 moze, 24 cans scan
ROAN 1 bops, 4 revs vers, 13 bane bean nabe, 17 fier fire reif rife, 20 limy*
ROSE 22 kaon koan
ROUGE 13 berth, 14 cuifs ficus
RUBY 2 dawt wadt, 10 bile, 13 helo hole, 16 khor, 17 lips lisp slip, 19 knur*, 20 vols
SABLE 3 hoved, 19 exuolt
SAXE 10 hock, 14 logs slog, 16 quin
SEPIA 14 gowds, 18 hawks, 22 alowe
SILVER 9 unbare unbear urbane, 13 verify
SLATE 8 ambit
STRAW 8 baize, 22 powns
TAN 4 rex, 11 Ely* (RHD) ley lye, 13 gan nag, 14 boh hob*, 15 pic, 17 erk, 20 hun
TEAL 1 bumf, 3 dhow, 7 lahs lash, 11 plew, 14 zhos, 15 pita, 22 whap
WHITE 4 limax, 7 podal, 22 sepad spade spaed

Letters of the Greek Alphabet

Eighteen of the 24 letters of the Greek alphabet are capable of producing shiftgrams, many of these being word-shifts. The number of word-shifts isn't that surprising, given that the names of many Greek letters are only two or three letters long.

The letter XI has the greatest number of different shift sizes, nine, while NU, PHI and PI all have eight. The longest shiftgram is the seven-letter UPSILON to AVOUTRY. Note that some of the shiftgrams are simply the names of other letters in the Greek alphabet (NU to PI, PSI to RHO).

ALPHA 4 Pelet (W2), 11 walls, 13 cunny (OED,W2), 19 tatie
BETA 7 hail hila, 13 rong, 14 hops phos posh shop soph
DELTA 7 lakhs, 15 pitas spait stipa tapis
ETA 1 fub*, 7 lah*, 11 lep, 14 hos ohs soh, 15 tip* pit, 22 paw wap, 24 cry*
GAMMA 18 sesey, yeses
IOTA 14 chow, 18 gals lags slag, 20 unci
KAPPA 11 laval (OED)
MU 2 ow* wo, 6 as, 10 we*, 14 ai*, 18 em* me, 20 go*, 22 qi
NU 6 at ta*, 10 ex, 11 fy, 13 ah* ha, 14 bi*, 17 el*, 20 ho* oh, 21 pi
PHI 5 mun, 7 pow wop*, 11 sat tas, 12 but tub, 15 wex, 22 del eld led, 23 emf fem, 25 hog
PI 5 nu un*, 11 at* ta, 15 ex*, 16 fy, 18 ah ha*, 19 bi, 22 el, 25 ho oh*
PSI 11 tad, 15 hex, 19 lib, 22 ole, 25 rho
RHO 1 sip* psi pis, 12 tad, 16 hex, 20 lib, 23 ole
TAU 4 yex, 6 zag, 7 bah, 10 ked, 11 elf*, 14 hoi

THETA 7 aloha, 11 leeps peels peles sleep speel, 20 bunny
UPSILON 6 avoutry
XI 3 al* la, 6 do* od, 7 pe, 10 sh, 11 it* ti, 16 ny*, 17 zo, 18 pa*, 22 et te*
ZETA 11 kelp, 14 hons nosh, 15 topi, 20 tuny

A number of other Greek letters, now discarded from the Greek alphabet, can also be added to the list, and are given below. SAN has as many different shift sizes as has XI. Notice that one of the SAN shiftgrams is FAN, differing only in its initial letter.

KOPPA 4 totes, 14 coddy (OED, W2), 24 minny
SAMPI 18 hakes, shake
SAN 1 bot, 2 cup, 4 rew, 8 via, 13 fan, 14 bog gob*, 20 hum, 21 vin, 22 jow

US Statenames

Only nine states produce shiftgrams, none of them throwing up a shift-word. IOWA has the most shiftgrams, with eleven different words and five different shift sizes. MICHIGAN has the longest shiftgrams.

IDAHO 4 helms, 17 furzy
IOWA 4 maes mase mesa same seam, 12 Maui (RHD), 14 wock, 18 goas sago, 22 ewks skew
MAINE 14 abows (OED,W2)
MICHIGAN 6 mootings, smooting, stooming (OED)
OHIO 23 fell
OREGON 13 barbet rabbet tabber (W3)
TEXAS 7 hazel, 11 lepid piled plied
UTAH 10 drek, 11 elfs self, 13 hung, 20 boun
WYOMING 6 costume

Days of the Week

Just a few days of the week produce shiftgrams. I like the eight-letter example THURSDAY to BRICK-END, even though there is an intrusive hyphen.

MONDAY 5 drifts, 14 comarb crambo
TUESDAY 14 simorgh (OED,W2)
THURSDAY 10 brick-end (OED)

Planets of the Solar System

Not a lot of scope here—just three of the planets are able to produce shiftgrams. Not surprisingly, the shortest name, MARS, has the most different shiftgrams and shift sizes.

EARTH 4 vexil
MARS 12 demy emyd, 14 goaf, 17 jird, 20 glum, 22 wino
PLUTO 19 hemin, 25 knots stonk tonks

Perhaps readers would like to see what their names yield when shiftgrammed. DARRYL appears to be impossible to do much with, but FRANCIS goes to KETCHUP!