SHIFTS PROGRESS

SUSAN THORPE
Great Missenden, Buckinghamshire, England
thorpeds@hotmail.com

A shift is the process which occurs when the letters of one word are all shifted the same number of steps along the alphabet (looping from Z to A) to make another word. For example OHM +1 = PIN, whilst CHEER + 7 = JOLLY. Here, I refer to these as basic shifts. This article examines other types of shift in which the shift values are not all the same but which abide by various rules. Each series of shift values makes a shift pattern.

Unreferenced words can be found in the Oxford English Dictionary, Second Edition. Other references: edl English Dialect Dictionary; OSPD Official Scrabble Players Dictionary; Pcon The Palindromicon by Jeff Grant & Dan Tilque; web2 Webster’s Second Edition.

Locations, identified by country, are taken from the United States Board on Geographic Names.

PROGRESSIVE SHIFTS - 4 LETTERS

A progressive shift is the name I give to shifts in which the shift values increase from one letter to the next such that the difference between the succeeding shift values is constant. This difference can be called the progressive constant (PrC). In order to avoid a letter shifting to itself (A to A, B to B etc.), which could be considered as a shift value of 0 or 26, shift values are here restricted to 25. This avoids looping more than once round the alphabet. This restriction, however, results in a decrease in the number of possible shift patterns as the PrC increases. Thus, in the case of 4-letter words, there are 22 shift patterns for a PrC of 1 (1.2.3.4 to 22.23.24.25) but only 1 pattern for a PrC of 8 (1.9.17.25.). Below, a single example is given for each of the shift patterns which abide by PrC’s of 1 to 8.

PROGRESSIVE CONSTANT = 1

Shift Pattern

<table>
<thead>
<tr>
<th>1.2.3.4.</th>
<th>2.3.4.5.</th>
<th>3.4.5.6.</th>
<th>TWIN - WANT</th>
</tr>
</thead>
<tbody>
<tr>
<td>RIVA - SKYE</td>
<td>PRAY - RUED</td>
<td>MILK - ROSS</td>
<td>MIME - SPUN</td>
</tr>
<tr>
<td>4.5.6.7.</td>
<td>5.6.7.8.</td>
<td>6.7.8.9.</td>
<td>YEAR - HOLD</td>
</tr>
<tr>
<td>OVAL - SAGS</td>
<td>MILK - ROSS</td>
<td>BRAY - NEON</td>
<td>DEAN - SURF</td>
</tr>
<tr>
<td>7.8.9.10.</td>
<td>8.9.10.11.</td>
<td>12.13.14.15.</td>
<td>MAIM - ETCH</td>
</tr>
<tr>
<td>DATA - KICK</td>
<td>LOAF - WANT</td>
<td>FRENCH</td>
<td>17.18.20.21.</td>
</tr>
<tr>
<td>SPAR - CAME</td>
<td>14.15.16.17.</td>
<td>15.16.17.18.</td>
<td>21.22.23.24.</td>
</tr>
<tr>
<td>FAWN - SOLD</td>
<td>OWEN - CLUE</td>
<td>DEAN - SURF</td>
<td>SAGO - OXEN</td>
</tr>
<tr>
<td>PAWN - FROG</td>
<td>KISS - Balm</td>
<td>MAIM - ETCH</td>
<td>22.23.24.25.</td>
</tr>
</tbody>
</table>

PROGRESSIVE CONSTANT = 2

Clun is a town in Shropshire, England.

<table>
<thead>
<tr>
<th>1.3.5.7.</th>
<th>2.4.6.8.</th>
<th>3.5.7.9.</th>
<th>PONE - STUN</th>
</tr>
</thead>
<tbody>
<tr>
<td>ARID - BUNK</td>
<td>BELL - DIRT</td>
<td>6.8.10.12.</td>
<td>FADS - LINE</td>
</tr>
<tr>
<td>4.6.8.10.</td>
<td>5.7.9.11.</td>
<td>9.11.13.15.</td>
<td>WAVE - FLIT</td>
</tr>
<tr>
<td>CLAD - GRIN</td>
<td>ABED - FINO</td>
<td>12.14.16.18.</td>
<td>PANG - BODY</td>
</tr>
<tr>
<td>HEAL - ONLY</td>
<td>HERE - PODS</td>
<td>NUBS - CLUN</td>
<td>BORG - TINE</td>
</tr>
<tr>
<td>TIED - DUST</td>
<td>EVAN - PIPE</td>
<td>NUBS - CLUN</td>
<td>18.20.22.24.</td>
</tr>
<tr>
<td>PLUS - CALL</td>
<td>EMIT - SCAN</td>
<td>NUBS - CLUN</td>
<td>18.20.22.24.</td>
</tr>
</tbody>
</table>
These progressive shifts have 5 letters. In each case the PrC is 1.

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1.2.3.4.5. DREAM - ETHER (see below)
4.5.6.7.8 ABILA (Spain etc.) - EGOSI (Nigeria)
6.7.8.9.10. CHORD - IOWAN, MIAMI - SPIVS
12.13.14.15.16. UNDER - GARTH

Seemingly, the only reference concerning what I call progressive shifts to grace the pages of Word Ways appeared in WW79050 as a short potpourri item. Roger Hannah challenged readers to determine the rule used to construct the following word pair set: O-P, NU-OW, EMU-FOX, RIBS-SKEW, DREAM-ETHER, and the 6-letter SPRENG - TRUISM. In our terminology, the answer is that, in each case, the PrC is 1 and the initial shift is a single letter shift.

PROGRESSIVE SHIFT CHAINS

Adjacent words in these progressive shift chains are linked by the same shift pattern. In each case the PrC is 1:

9.10.11. RAX (a stretch) - AKI (a tree) - JUT - SEE - BOP - KYA (an African's hut) - TIL (a plant)
2.3.4.5. NOWT - PRAY - RUED
8.9.10.11. STUG (a pig trough) - ACER - ILOC (Philippines) - QUYN (queen)
It is possible to construct a chain in which the PrCs 1 to 11 are represented in order.

ENT (a tree) SIM - 4 - AUC
AKI
1
JUT - 2 - BOP

(Vietnam) IUU - 8 - KEM
OMY

(Prussian) (comb)

PROGRESSIVE PROGRESSIVE SHIFTS

Progressive progressive shifts seems a suitable term to apply to those shift patterns which move forward a constant amount from one word to the next:

SUVI 4.6.8.10. WADS 6.8.10.12. CINE
PAUL 4.7.10.13. THEY 7.10.13.16. ARRO (Spain etc.)

REGRESSIVE SHIFTS

Perhaps this is a suitable stage at which to point out that any progressive shift becomes a regressive shift (or vv) when the two words exchange places. For example, the progressive shift WON - LEE (15.16.17.) becomes the regressive shift LEE - WON (11.10.9.). The respectively-placed numbers in the two opposing shift patterns always add up to 26 (15+11, 16+10, 17+9). In this particular case, if the letters of these 2 words are reversed we also have EEL - NOW (9.10.11.) and NOW - EEL (17.16.15.).

The regressive shift VAL - QUE (21.20.19.) is unusual in that the two words combine to make another word - VALQUE (Nicaragua).

PROGRESSIVE SHIFTS INVOLVING VARIOUS WORD GENRES

All except one (*) of the progressive shift patterns below have a PrC' of 1.

PALINDROMES

1.2.3. ZYY - AAA, DUB - EWE
18.19.20. OHM - GAG
3.4.5.6. HAZE - KEEK, BONY - ESSE
9.10.11.12. DEED - MOPP (mop)
15.16.17.18. WONT - LEEL (edd)

The word KUTH (couth) can be progressively shifted to make the palindromes shown. Basic shifts connect the palindromes:

PAAP (edd) 5.6.7.8. TEET 9.10.11.12. UFFU (Pcon) 6.6.6.6. ALLA (web2) 3.3.3.3. DOOD 1.1.1.1. EPPE (Germany)

TAUTONYMS

A tautonym may form one word of a shift pair:

3.4.5.6. IEIE (a screw-pine) - LINK 18.19.20.21. EYEY (full of eyes or holes) - WRYT (write)

MIAMI WORDS (pattern 12?12)

Miami words can also be progressively shifted:

2.3.4.5.6. MIAMI - OLERO (Kenya) 9.10.11.12.13. SENSE - BOYER (Charles)
WORDS MADE FROM ALPHABETICALLY-CONSECUTIVE LETTERS

The top row below shows how certain 3-letter words, consisting of alphabetically-consecutive letters in order, can be linked by basic shifts. Their reversals, on the bottom row, are also linked by the same basic shifts. In between, the two sets of words behave as the target, and source, respectively, of progressive shifts using the palindromic word AAA (chief of the signet bearers in the court of the Egyptian king Aspalut). All the shifts linked to AAA have a PrC of 1.

PIVOTAL SHIFTS

Pivotal Shifts is the name I give to letter shifts which all start at the central letter (pivot) of a word with an odd number of letters and shift, in turn, to each of the other letters of the word from left to right. Consider MOGUL. The pivot is G and hence the pivotal shifts are G to M (6), G to O (8), G to U (14), and G to L (5). In this, and most words with an odd number of letters, the length of the shifts bear no relation to each other. Occasionally, however, we come across words in which the pivotal shifts form a pattern. The two words below demonstrate pivotal types of progressive and regressive shifts respectively.

ILFOR progressive shift

KIDGE regressive shift

In the first word, ILFOR, the pivotal letter F is shifted to the four letters I, L, O and R in turn. The length of each shift supercedes the length of the previous shift by the same number of steps: F to I (3), F to L (6), F to O (9), F to R (12). It could be said that the word ILFOR has a pivotal PrC of 3. ILFOR is the name of a stream in East Timor.

In KIDGE, the pivotal letter D is similarly shifted to K, I, G and E in turn. In this case, however, the length of each shift is shorter than the length of the previous shift by the same number of steps: D to K (7), D to I (5), D to G (3), D to E (1). Thus KIDGE has a pivotal regressive constant of 2. KIDGE = ‘kedge’ - meaning brisk, lively, in good spirits.

NUMBER SERIES AS SHIFT PATTERNS

A group of adjacent numbers extracted from a particular number series can be used as a shift pattern. With one exception (*) the shift values below progress but not by a constant amount. The reader is reminded that the maximum shift value under consideration is 25. The significance of + is explained in the later section entitled The Difference Between Successive Shift Values.
## FIBONACCI SHIFTS

Fibonacci number series: 1.1.2.3.5.8.13.21...

1.*1.2.3. CHIP - DIKS, SHAH - T ICK, STEP - TUGS
1.2.3.5. ICON - JERS, OMIT - POLY, TEEN - UGHS
2.3.5.8. BLOW - DOTE, NODE - PRIM, RODE - TRIM
3.5.8.13. LOAF - OTIS, POSE - STAR, PRAT - SWIG
5.8.13.21. DENS - IMAN (Imam), FAYS - KILN, OWES - TERN

### SQUARE SHIFTS

Square numbers: 1.4.9.16.25...

#### 4 letters
1.4.9.16. LARD - MEAT, MAIN - NERD, GAIN - HERD
4.9.16.25. AMOS - EVER, KILT - ORBS, WISE - ARID

#### 5 letters
1.4.9.16.25. MAMOS (sunbirds) - NEVER

### PRIME SHIFTS

Prime numbers: 2.3.5.7.11.13.17.19.23...

#### 4 letters
2.3.5.7. PRAY - RUFF, PRIM - RUNT
3.5.7.11. AVON - DAVY, IDLE - LISP, PONS - STUD, PORT - STYE
5.7.11.13.+ CRAN - HYLA (a toad), DOTE - IVER (ivory), JOTA - OVEN, VEAL - ALLY
7.11.13.17.+ LANG - SLAT, YARM - FLED, THUN - ASHE
11.13.17.19.+ ANIL - LAZE, HUNK - SHED, HURT - SHIM, TINY - EVER
13.17.19.23.+ ANEW - NEXT, GRUB - TINY, S NUG - FEND

#### 5 letters
5.7.11.13.17. CHARM - HOLED

## SPECIAL SHIFT PATTERNS

Again, in the lists below, the successive shift values do not have a $PrC$. The shift patterns represent a selection of the many palindromic, tautonymic and Miami numerical patterns. The words themselves exclude any palindromes, tautonyms or Miami words.

### PALINDROMIC SHIFT PATTERNS

#### 4 letters
1.2.2.1. AMID - BOKE 1.3.3.1. SERF - THUG 1.4.4.1. SEAR - TIES
2.4.4.2. NEAP - PIER 8.23.23.8. DREW - LOBE 11.3.3.11. SLIT - DOLE
13.1.1.13.+ RUDE - EVER 14.4.4.14. BASE - PEWS 25.5.5.25. SPOT - RUTS

#### 5 letters
1.2.3.2.1. RARER - SCUGS 1.6.9.6.1. BUILD - CARRÉ 14.9.3.9.14. FYFES - THING
16.3.22.3.16. DEMON - THIRD 23.7.14.7.23. WAUGH - THINE

#### 6 letters

### TAUTONYMIC SHIFT PATTERNS

#### 4 letters
1.2.1.2. ICED - JEFF 1.4.1.4. LARD - MESH 1.12.1.12. BIRD - CUSP
3.23.3.23. PRIG - SOLD 4.11.4.11. SWAN - WHEY 9.3.9.3. TORY - CRAB

#### 6 letters
MIAMI SHIFT PATTERNS
1.2.3.1.2.  DEVOR - EGYPT  13.7.24.13.7.  EXCEL - REARS  13.10.22.13.10.  THIRD - GREEN
25.1.7.25.1.  TONER - SPUDS  25.20.11.25.20. CAMPS - BUxOM

OTHER SHIFT PATTERNS
Theoretically, any relatively short series of numbers can form a shift pattern. With 4 digits, ‘years’ offer themselves as shift patterns. Special years can be selected. In this particular case, both the words are apposite to the event:
1.4.9.2 SAIL - TERN (sea bird)  In four hundred and ninety two, Columbus sailed the ocean blue...

THE DIFFERENCE BETWEEN SUCCESSIVE SHIFT VALUES
In certain shifts the difference between successive shift values is significant. Consider the 3-word chain GRUB 13.17.19.23. TINY 11.13.17.19. EVER. The differences between the successive shift values are palindromic. GRUB 4.2.4. TINY 2.4.2. EVER. More palindromic examples (marked +) can be found earlier in the article under Number Series as Shift Patterns - Prime Shifts.
The differences between the successive shift values of some reversals are palindromic:
PINS 3.5.21.23. (2.16.2.) SNIP  FLOG 1.3.23.25. (2.20.2) GOLF SPAY 6.11.15.20. (5.4.5.) YAPS
The differences between the successive shift values may be tautonymic...
CHARM 5.7.11.13.17. (2.4.2.4.) HOLED
...or adhere to a Miami pattern:
COLAGE (college - web2) 1.6.7.19.24.25. (5.1.12.5.1.) DUSTED

MISCELLANEOUS
Here, the SAME BIGRAM appears in both words: 12.13.14.15.  FREE - REST, HUGO - THUD
NAMES can be progressively shifted to make other names:
PrC = 1  3.4.5.  IAN - LES, KAY - NED  4.5.6.  IVY - MAE
PrC = 2  2.4.6.  REG - TIM  9.11.13  ADA - JON, IDA - RON
13.23.8.13.23.  SUSAN - FRANK has a Miami shift pattern.

Some progressive, and other, shifts make PHRASES:
Progressive Shifts
PrC = 1  7.8.9.10.  LORD - SWAN  14.15.16.  OLD - CAT  15.16.17.18.  NEAT - CURL
PrC = 2  11.13.15  PAY - ANN
PrC = 7  3.10.17.24.  TEAM - WORK
Palindromic Shift
1.2.2.2.1.  ROSY'S - SQUAT
Tautonymic Shifts
1.4.1.4.  ANN'S - BROW
1.12.1.12.  FOSS - GATE (FOSSGATE is the name of a street in the city of York, England)
Miami Shift
13.10.22.13.10.  THIRD - GREEN

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Finally, word has it that SHIFT itself has moved to TONGA - via Miami!