

VARIETIES OF BALANCED WORDS, PART 2

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2. NUMERICAL TAUTONYMS

This is the second of three parts of an article dealing with varieties of "balanced" words. Numerical tautonyms are words which may be divided into groups of letters, each group having the same number of letters, and where the sums of the numerical values (A=1, B=2, etc.) of the letters in each group are the same. For example, GNATLING may be divided into four groups: GN-AT-LI-NG, and the sum of each pair of letters is 21. I allow words of odd length to be double tautonyms by defining both halves to include (or exclude) the central letter, which is not the custom with letter tautonyms (in which the word consists of a group of letters repeated). Letter tautonyms are always numerical tautonyms. The tautonyms listed below are split approximately equally between words of even length and words of odd length. Of the even length double numerical tautonyms (two groups), just over 7 per cent are word tautonyms.

Making the Alphabet Dance gives the longest numerical tautonym in Webster as biobiblio/graphical (length 18). In fact, Webster 2 contains 13 such words of length 18, nine of length 19 and two of length 20 (OPH-THALMOBLENNORRHEA and PHILOSOPHICOJURISTIC). Words which divide into two groups are common, about three times as frequent as two other varieties of "balanced" words--words with an average letter value of 13.5 and words which balance (in a physical sense, see Part 3) about a letter or space. In fact, numerical tautonyms account for 2 to 4 per cent of shorter words.

Assuming that letters appear at random in words, I predicted the numbers of double numerical tautonyms for 4-, 5-, 6- and 7-letter words. The results, recorded in the third row of the table, are a little pessimistic (especially for 4-letter words). Most of the reason for this is that the percentage of 4-letter word tautonyms is 0.66 per cent, far higher than the random assumption of 0.15 per cent (and for 5 letters, the actuality is 0.41 per cent compared with the same expectation). The underestimate is not severe, and not unexpected in view of the human predilection for repetitive sounds. This table was drawn up a little while ago.

2a. NUMERICAL TAUTONYMS WITH TWO GROUPS

Length:	4	5	6	7	8	9	10	11	12	13	14
Frequency:	450	941	1437	1808	1887	1809	1556	1430	1061	807	560
Prediction:	338	822	1120	1487							

Length:	15	16	17	18	19	20	21	22	23	24	25
Frequency	387	252	154	105	55	23	19	15	7	6	2

In the following lists, the designation 2/n means that the n-letter word is split into two. Up to (and including) length 20, sample words only are given. Although the above numbers include all numerical tautonyms, these samples exclude any (except LEPTOSTAPHYLINES) whose average letter value is 13.5, as these were dealt with in Part 1 of this article. For the sources of the following words, please refer to Part 1.

Words like FICK-FICK (an invitation heard in Cairo) are excluded as they belong to a subset of tautonyms called "naughtonyms".

2/4: AVER, BULK, CHEF, DUET, EXIT, FOIL, GILD, HUMP, ISOM, JEAN, KNIP, LEAP, MEND, NEAR, OKAY, PALE, QUOW, RUST, SELL, TIDY, UNTO, VAIN, WALL, YERL, ZIPS

2/5: APPLE, BITCH, CHAFE, DOZEN, ERECT, FLAME, GRATE, HOVER, INFER, JENNA, KRAIT, LATHE, MOUTH, NITRE, OLIVE, PANEL, QUART, REACT, SHAVE, THREW, UNGOT, VAIRE, WAKES, XENON, YAPOK, ZEALS

2/6: ANORAK, BOTTLE, CONDOM, DISARM, EXODUS, FACADE, GINGER, HOLLER, IODINE, JINXED, KEELED, LOOSER, METEOR, NEGATE, OCTAVO, PICKLE, QUACKY, RACIAL, SERMON, TRAVEL, UTMOST, VACATE, WHEEZE, XENIUM, YAREST, ZEUXIS

2/7: ABSENCE, BLOATED, CLOSING, DESPAIR, ESTUARY, FLOTSAM, GAMBLER, HILLOCK, ICICLED, JAWBONE, KESTREL, LOCKING, MISTOOK, NICTATE, OMNIBUS, PANTHER, QUORUMS, RELIANT, SKIPPER, THINNER, UNCTION, VALIANT, WARRIOR, XEROSIS, YELPERS, ZANYISM

2/8: ABSTRACT, BACKACHE, CONTRITE, DECREASE, EXPLORES, FISHTAIL, GRAPHITE, HUNGRIER, IMBECILE, JAILBAIT, KLYSTRON, LANGUAGE, MANIFOLD, NOSINESS, ORIENTAL, PLEDGING, QUEERING, REVERSAL, SHIPMENT, TAILORED, UTERUSES, VANGUARD, WHENEVER, XERASIAS, YEOMANRY, ZYGOSITY

2/9: ABSORBANT, BARTENDER, CONDEMNED, DESPERATE, ENTERTAIN, FEATHERED, GLOSSIEST, HABITABLE, IMMIGRATE, JASPEROID, KINESCOPE, LUMBERING, MINCEMEAT, NEWSPRINT, OBTRUSIVE, PERIMETER, QUARRYMEN, RAUNCHILY, SEASONING, TELEPHONE, UNFAILING, VODKATINI, WINEGLASS, XENOGLAUX (ACCB), YEARLINGS, ZESTFULLY

2/10: ASSORTMENT, BLUNDERING, COMPATIBLE, DESIGNATED, ENTHUSIAST, FRIGHTENED, GRUESOMELY, HIERARCHIC, INCINERATE, JAUNTINESS, KINEMATICS, LOVELINESS, MAIDENHEAD, NOMINATURE, OVERBURDEN, PERCENTAGE, QUADRIFORM, REGIMENTAL, SEPARATION, TACTICALLY, UNDERCROFT, VEGETATION, WEALTHIEST, YERNBLITER, ZINCIFYING

2/11: ASSOCIATIVE, BETROTHMENT, CIRCUMCISER, DEVASTATING, EVAPORATION, FESTINATION, GYROCOMPASS, HAIRBREADTH, IMPERIALIST, JAWBREAKERS, KINSMANSHIP, LOGARITHMIC, MEGALOMANIA, NONENTITIES, OBSERVATION, PREMONITION, QUASSATIONS, REGIONALISM, SPIRITUALLY, THUNDERBOLT, UNCONSCIOUS, VERMICULITE, WOLFISHNESS, XANTHOPTICS, YELLOWSHINS, ZOIDOGAMOUS

2/12: APOCHROMATIC, BRINKMANSHIP, CANTILEVERED, DISCRIMINATE, ENTOMOLOGIST, FRATERNALISM, GESTICULATED, HYDROFORMING, INTERDICTION, JOKESOMENESS, KILLEEKILLEE, LENTICULATED, MYSTIFYINGLY, NOTEWORTHILY, ORCHESTRATED, PERPETUATION, QUINDECIMVIR, RACKETEERING, SOLILOQUIZED, TRANSMISSION, UNFAVOURABLY, VOCABULARIES, WORSHIPFULLY, XANTHOPTERIN, YARNFINISHER?, ZINC CHLORIDE

2/13: ASTHMATICALLY, BASIVERTEBRAL, CRAFTSMANSHIP, DEDUPLICATION, EXCLUSIVENESS, FERROCONCRETE, GESTICULATING, HAIRSBREADTHS, IMPERCEPTIBLE, JUNGLE-COVERED?, KLEISTOGAMOUS, LOATHSOMENESS, METAMORPHOSED, NITROALIZARIN, OBSESSIONALLY, PEDIATRICIANS, QUADRATICALLY, RECRUDESCENCY, STRENUOUSNESS, TRANSGRESSIVE, UNCONDITIONAL, VERBIFICATION, WEARISOMENESS, XENOMORPHOSIS, ZINC ENGRAVING

2/14: ABORTIFACIENTS, BIREFRINGENCES, CONTORTIONISTS, DISEQUILIBRIUM, EXASPERATINGLY, FAIRMINDEDNESS, GREENGROCERIES?, HIEROGLYPHICAL, INDIVISIBILITY, JUXTAPAPILLARY, KERATOECTATICS, LOCALIZABILITY, MANSLAUGHTERER, NEUROHYPNOTISM, OSMOREGULATION, PHOTOSENSITIVE, QUADRANTANOPIA, RECONNAISSANCE, SCAREMONGERING, THROMBOPLASTIN, UNINTERMITTENT, VALETUDINARIUM, WINDOWLESSNESS, XANTHODERMALLY, ZENOCRATICALLY

2/15: AUTOCOMBUSTIBLE, BLASTOGENICALLY, COUNTERPROPOSAL, DOCTRINARIANISM, ELECTROPHORETIC, FLIBBERTIGIBBET, GLOUCESTERSHIRE, HEAVYHANDEDNESS, INCORRIGIBILITY, KERATOLYTICALLY, LARYNGOSTOMIZED, MISINTERPRETING, NUMISMATOGRAPHY, OPHTHALMOSCOPIC, PARENTHETICALLY, QUARTER SESSIONS, RETROPERITONEUM, SUPERIMPOSITION, TELECOMMUNICATE, UNACCOMMODATING, VASOINHIBITIONS, WESTERNIZATIONS or WINDSCREEN WIPER

2/16: AUTOALLERGICALLY, BIOENVIRONMENTAL, CONSTRUCTIVENESS, DISTINGUISHINGLY, EXEMPLIFICATIONS, FLUOROPHOTOMETER, GALVANOPALPATION, HETEROSCOPICALLY, INARTICULATENESS, KERATECTATICALLY, LEPTOSTAPHYLINES, MONOTONOUSNESSES, NONOBSTRUCTIVELY, ORTHOSUBSTITUTED, PSEUDOHISTORICAL, QUANTIMETRICALLY, RETROPHARYNGEALS, STEREOMETRICALLY, TELERADIOGRAPHED, UNPREMEDITATEDLY, VASOINHIBITORIES, WELLCONCENTRATED?, ZENITH COLLIMATOR?

2/17: AUTOSENSITIZATION, BRONCHOPHONICALLY, CHEMILUMINESCENCE, DIETHYLTRYPTAMINE, EPISIOPLASTICALLY, HYPERCIVILIZATION, IMPERCEPTIBLENESS, KINETOCARDIOGRAPH, LYMPHANGIECTOMIZE, MICROBIOLOGICALLY, OMPHALOMESENTERIC, PHOTOMICROSCOPICS, QUADRIPARETICALLY, REPRESENTATIONISM, SPIRITUALIZATIONS, TRANSDISCIPLINARY, UNCOLLECTIBLENESS, VENOCONSTRICTIONS, WELLAPPOINTEDNESS?, ZYGOSACCHAROMYCES

2/18: AEROTHERMODYNAMICS, BRONCHOSPIROMETRIC, CINESEISMOGRAPHICS, DIASTEMATOCRANIALS, ESTABLISHMENTARIAN, FIBROFOLLICULOMATA, GASTROENTEROTOMIES, HYPERPIGMENTATIONS, INTRACOMMUNICATION, LEUKOKRAUROTICALLY, METRODYNAMOMETRICS, NODULOULCERATIVELY, OVERCIRCUMSPECTION, PHONOCINEMATOGRAPH, RECTOCYSTOTOMIZING or REMEMBRANCE SERVICE, SOMNAMBULISTICALLY, TRIAKISICOSAHEDRON, UNDENOMINATIONALLY

2/19: ARTERIOPHLEBOTOMIZE, BASICYTOPARAPLASTIN, CLINICOPATHOLOGICAL, DACRYOSCINTOGRAPHIC, EXTRATERRITORIALITY, FILAMENTNONFILAMENT, GASTROCHRONORRHEICS or GENTLEMAN'S GENTLEMAN, HISTODIFFERENTIATED, INTELLECTUALISATION?, LAPAROSPLENECTOMIZE, MICRONEUROVASCULARS, OSTEORADIONECHROTICS, PALEOMETEOROLOGICAL, RHOMBENCEPHALICALLY, STAPHYLOCOCCOLYSINS, THROMBELASTOGRAPHED, UNAPPREHENSIBLENESS, ZYGOMATICOTEMPORALS

2/20: ARTERIOSCLEROTICALLY, BACTERIOPHEOPHORBIDE, CYSTOGASTROSTOMIZING, GOLD EXCHANGE STANDARD, HYPERCHOLESTERINEMIC, LYMPHOGRANULOMATOTIC, MEGALOSPLANCHNICALLY, OPHTHALMOBLENNORRHEA, PHILOSOPHICOJURISTIC, SPLANCHNOPLEURICALLY, TRACHEOBRONCHOSCOPIC

From this point, all the words found are listed

2/21: ACROSPHENOSYNDACTYLIA, CELIOHYSTERECTOMIZING, CINEROENTGENOGRAPHICS, DACRYOCYSTOPTOTICALLY, ENDOCRINOTHERAPEUTICS, HEMOGLOBINOCHOLICALLY, HYPERCHOLESTERINEMICS, LEUKOCYTOSISPROMOTING, MACROLEUKOBLASTICALLY, METHYLNORTESTOSTERONE, MICRORADIOGRAPHICALLY, PHLOGOTHERAPEUTICALLY, PHOTOPHOSPHORYLATIONS, PNEUMOENCEPHALOGRAPHY, PSEUDOEPITHELIOMATOUS, SCLERECTOIRIDECTOMIZE, THERMOPLACENTOGRAPHIC, TREPONEMAIMMOBILIZING, VITREOTAPETORETINALLY

2/22: APPENDICULORADIOGRAPHS, GLOSSOLABIOPHARYNGEALS, HYPERADRENALINEMICALLY, HYPERMETAMORPHOTICALLY, INFRADIAPHRAGMATICALLY, LABIOGLOSSOPHARYNGEALS, LARYNGOPHARYNGECTOMIES, NASOTRACHEOBRONCHIALY, PHARYNGOLARYNGECTOMIES, SCINTICISTERNOGRAPHIES, STAPHYLOCOCCOLYTICALLY, STEREOENCEPHALOMETRIES, SULFAMETHOXYPYRADAZINE (W95-012), TORTOISESHELL BUTTERFLY, TYPHLOURETEROSTOMIZING, URETEROSIGMOIDOSTOMIZE

2/23: CARDIOHEPATOMEGALICALLY, CONJUNCTIVORHINOSTOMIES, ELECTRONEUROMYOGRAPHIES, EPIKERATOPROSTHETICALLY, PHRAGMOBASIDIOMYCETIDAE (OPC), TELEROENTGENTHERAPEUTIC, URETEROPYELONEOSTOMIZES

2/24: CERVICOOCULOACOUSTICALLY, COMMITTEE OF THE WHOLE HOUSE, DACRYOCYSTORHINOSTENOSIS, HYPOBETALIPOPROTEINEMIAS, POLYRADICULONEUROPATHIES, RADIOELECTROCARDIOGRAPHY, ROENTGENCINEMATOGRAPHING

2/25: CROTAPHYTICOBUCCINATORIUS, NEPHROURETEROCYSTECTOMIZE

2/26: ACROCEPHALOSYNDACTYLICALLY, COUNTERELECTROPHORETICALLY

2/27: URETEROPYELONEPHROSTOMIZING, UVULOPALATOPHARYNGOPLASTIES

2/37: LAPAROHYSTEROSAL PINGOOOPHORECTOMIZING

2b. NUMERICAL TAUTONYMS WITH MORE THAN TWO GROUPS

No. of groups/length:	3/6	4/8	3/9	3/12	4/12	7/14	3/15	3/18
Frequency:	72	15	95	35	3	1	9	2

No word appears in more than one category. As an example, MISCO-NSECR-ATION breaks into three groups as shown (each totalling 59), so appears under the heading 3/15, meaning it has 3 groups, and its length is 15. I report a selection from the 3/6, 3/9 and 3/12 categories, and all others. The categories n/n, in which each letter is a group (like Z-Z-Z-Z), are omitted. As will be observed, numerical tautonyms with more than two groups are rare: less than 0.02 per cent of all words. I found no example for five groups, but Ross (MAD) gave the placename GL-EN-DO-RA-DO in Minnesota. Again, words listed in Part 1 as ALVs are omitted, except for ZARISH and RIVERISH.

3/6: AVERIN, BULKER, COMEND, DEEDED, ESSELL, FROISE, GRETTE, ILLING, JONKET, LINGAT, MIMICS, NOTION, OCCOME, PHIOLL, REAVER, SABRAS, TAPETA, UNZIPS, VAINER, WEYCHT, ZARISH

4/8: COME COME!, CRATLING, CUCULLES, FORCLING, GNATLING, JEANJEAN, JIRAJIRA (W82-114), KEEK-KEEK, KUKUKUKU (Web3), NOTITION, PEEPLING, PEEP-PEEP, PETALING, RIVERISH, TANGLING

3/9: AMENDABLE, BUTTERFLY, CHROMATED, DISENMESH, DOG-EAT-DOG, ESCLANDRE, FASCINATE, GERIATRIC, HOMOTAXIC, INPAYMENT, KEELHALED, MATCHWOOD, NITTINESS, OVERSEERS, PERFLUENT, REPAYMENT, SPANDRELS, THYROTOMY, UNDERPASS, VACCINATE, WHOO-WHOOP

3/12: ABSTINENTIAL, BRANCHIOMATA, CLOP-CLOPPING, DOCTRINARIAN, EPONYMICALLY, FAIRPLEADING, FOLLICULATES?, GARDENCHAFER?, INAPPLICABLY, KNICK-KNACKER, MANUSCRIPTAL, NECROPHAGIES?, PROCESSIONER, SHERRIVARRIE, THANATOGRAPH, YACK-YACK-YACK (*Language on Vacation*)

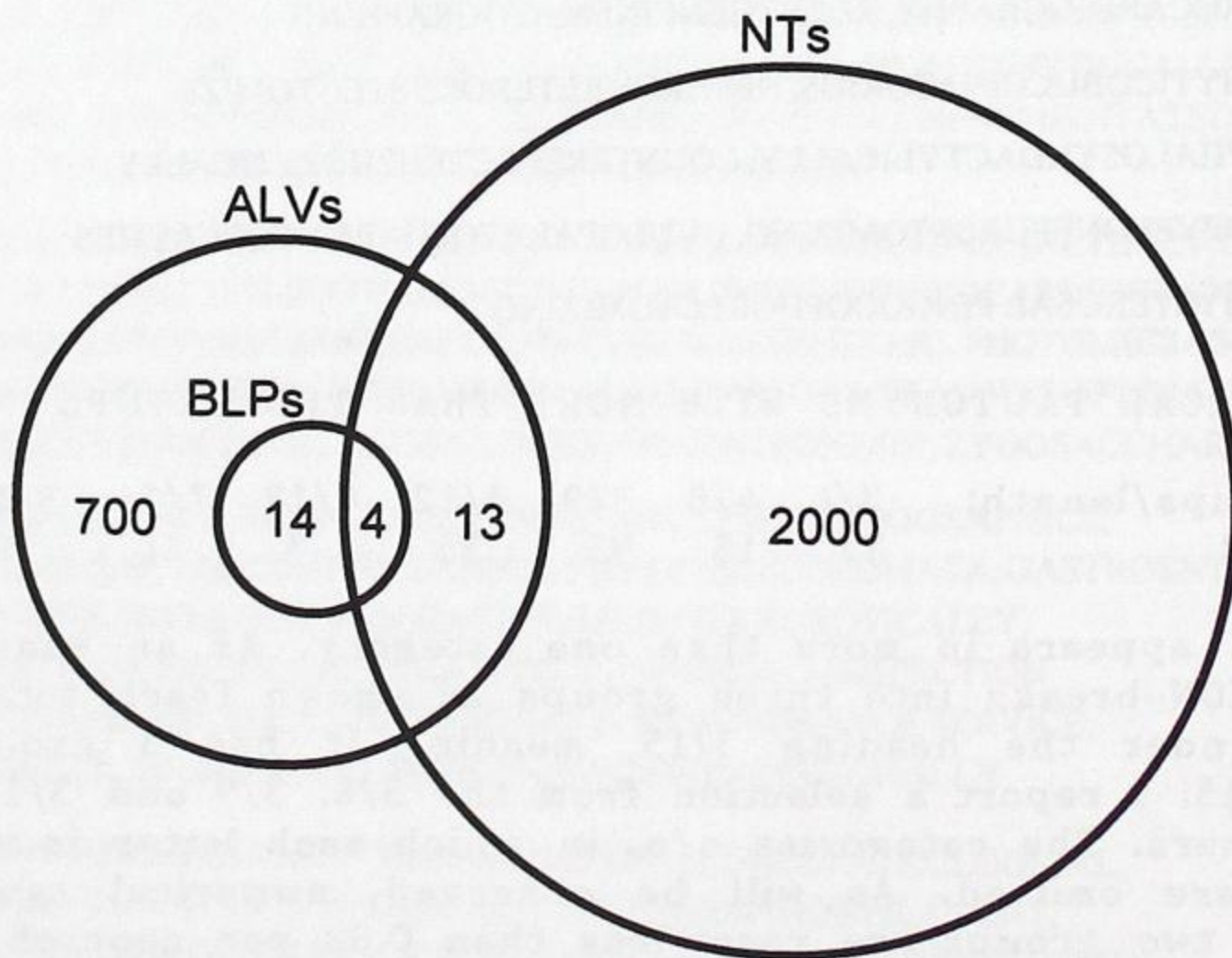
4/12: OVERSECURELY, PSEUDOFOSSIL, UNDERPAYMENT

7/14: BUBUBUBUBUBUBU (DJE)

3/15: AUTOSUPPRESSION, BIOSPECTROMETER, CIRCUIT BREAKERS, CONSOLATORINESS, HEAVYFOOTEDNESS?, ICHORRHEMICALLY, MICROMICROGRAMS, MISCONSECRATION, UNSECRETARYLIKE

3/18: MICROMYELOBLASTICS, MICROSPECTROSCOPES

Number of each category of word per hundred thousand Dictionary words



ALVs = words with an average letter value of $13\frac{1}{2}$

BLPs = words with pairs of letters, each pair adding to 27

NTs = Numerical tautonyms

The approximate numbers indicate how many of a given type of word exist per 100,000 dictionary words, eg about 13 in every 100,000 dictionary words are ALVs and NTs but not BLPs.

The two large circles are to proper areal scale, but the smallest circle is much exaggerated.