ANYTHING TRILINEAR

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Why anything trilinear? Those two words in the title are non-crashing isomorphs of the two-word term "Designer Isomorphs," the title of Susan Thorpe's article in the May 2001 issue. (A quick reminder: *isomorphs* are words having the same letter pattern. Susan's example was EXCESS BAMBOO, with both words sharing the pattern 123144. ANYTHING and DESIGNER share the pattern 12345627, while TRILINEAR and ISOMORPHS share the pattern 123435672. Two isomorphs are said to *crash* if they share the same letter(s) in the same position(s). ANYTHING and DESIGNER don't crash, and neither do TRILINEAR and ISOMORPHS, so they are *noncrashing isomorphs.*)

I thought it would be interesting to see to what extent Susan Thorpe's May 2001 article on isomorphs (and some of the predecessor articles) could be improved and/or extended by the use of software having isomorph-related functionality. Let me hasten to say that I am not trying to nitpick Susan's article—I think she's done a brilliant job. But what I do want to do is demonstrate how simple it can be to uncover improvements when using appropriate pc-based facilities. I'm sure that much of the material that has appeared in Word Ways over the last three decades, including my own, can be improved/bettered/extended by using pc-based facilities.
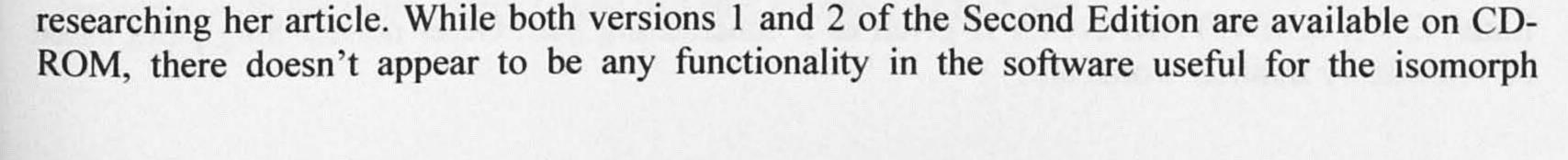
There are two particularly useful pieces of software for researching isomorphs.

Firstly, there's LeXpert, which was described briefly in my article "Fifteen-Letter Transdeletion Pyramids" in the May 2001 Word Ways. LeXpert is primarily for Scrabble players, but has so many useful pieces of functionality that it's a real boon for logological-type research. For example, LeXpert enables the user to search for all words matching a specified isomorph pattern (e.g., all words matching the pattern of AMERICAN), and the user can then progressively interrogate the results (now show me the words not having an A in the first position, now show me the words not having an M in second position, and so on, until one ends up with a list of the noncrashing isomorphs of AMERICAN).

Secondly, there's the CD-ROM version of Webster's Third New International Dictionary. This Merriam-Webster software enables the user to search for words and other entries (i.e., hyphenated words and phrases) having a specified isomorph pattern. But the user cannot then interrogate the results further. The functionality is less than that provided by LeXpert, but the big plus is having access to the extensive collection of words that is Webster's Third.

I suspect that Susan did not have either of these pieces of software to hand when researching her article.

Susan obviously made extensive use of the Oxford English Dictionary (Second Edition) when researching her article. While both versions 1 and 2 of the Second Edition are available on CD-ROM, there doesn't appear to be any functionality in the software useful for the isomorph

researcher (unless it is present in the software but not documented in the help facilities or the user manual). I'm sure that Susan must have had the CD-ROM-based version of the OED available to her. It would have been invaluable—so much quicker than thumbing through a "dead tree" version of the dictionary. Even so, using the CD-ROM version must have been pretty hard going without any isomorph-type functionality.

So let's see what gaps LeXpert and Webster's Third can plug...

LeXpert has 632 words sharing the same pattern as AMERICAN and KENTUCKY—and AMERICAN and KENTUCKY aren't part of that 632! Only 20 of the 632 have a crashing C (for example, ATYPICAL, HEXARCHY and UNDERCUT). And as many as 267 don't crash with either AMERICAN or KENTUCKY! The figures would, of course, be different if Webster's Third was searched—probably quite a lot higher.

Susan notes that Leslie Card claimed in February 1973 that CHECKBOOK has no isomorph, but she found EMBESILLS and EMBESYLLS, both variants of EMBEZZLES, in the OED. LeXpert quickly throws up the noncrashing NAINSELLS. Webster's Third provides no additional isomorphs for CHECKBOOK.

Susan notes that David Silverman in August 1974 offered the thirteen-letter specimens CONCEPTUALISM and EXCEPTIONABLY as noncrashing isomorphs, albeit both contain the four-letter sequence CEPT without crashing. A few key depressions on LeXpert quickly identifies further words with the same isomorphic pattern: AGRANULOCYTES, REPROACHINGLY, SWASHBUCKLING and UNCUSTOMARILY. These six words provide the following noncrashing pairs:

AGRANULOCYTES/CONCEPTUALISM   AGRANULOCYTES/REPROACHINGLY
AGRANULOCYTES/SWASHBUCKLING   AGRANULOCYTES/UNCUSTOMARILY
CONCEPTUALISM/EXCEPTIONABLY   CONCEPTUALISM/REPROACHINGLY
EXCEPTIONABLY/SWASHBUCKLING   REPROACHINGLY/SWASHBUCKLING

Turning to Webster's Third uncovers one additional isomorph, the splendid MYRMECOPHAG-ID. Unfortunately, this crashes with all the others except for SWASHBUCKLING.

Notice that AGRANULOCYTES/CONCEPTUALISM/REPROACHINGLY provide a mutually noncrashing group. Is this the longest group of three mutually noncrashing words? In attempting to answer this question, avoid consideration of heterograms (words with no repeated letters). Here is a noncrashing isomorphic threesome, with 14 letters each, where each word is a heterogram: AMBIDEXTROUSLY/DERMATOGLYPHIC/TROUBLEMAKINGS.

Susan provides noncrashing examples of isomorphs for 27 of the statenames, based on earlier work by Ross Eckler in November 1977. Here are a few comments worthy of note about state-name isomorphs.

For ARKANSAS, Susan offers the isomorphic ENSEURER. This only appears in the Oxford English Dictionary as an old French verb having the same meaning as ENSURE. A superior solution is achieved by noting that Webster's Third contains the noncrashing CONCHUCU.

Later, COLORADO/PARANOIA is given as a noncrashing pair. Other noncrashing pairs based on reasonably familiar words are:

COLORADO/BARATHEA   COLORADO/DECENTRE   COLORADO/HABANERA
COLORADO/PANATELA   COLORADO/PARABOLA   COLORADO/RESEMBLE

INDIANA/KECKSES is given as a noncrashing isomorphic pair. First off, KECKSES appears to be a supposed plural of KECKS, itself a variant form of KEX, dried stalks. Although KECKSES does not appear in the Oxford English Dictionary, it is shown in Official Scrabble Words (4th and earlier editions). This is good enough to get it into LeXpert, and, from that point of view, it is a legitimate isomorph of INDIANA. The extensive English Dialect Dictionary lists a variety of different spellings of KEX and its derivatives, yet doesn't have KECKSES. A more modern meaning of KECKS, familiar in Britain but probably unknown to US readers, is simply "trousers". Eric Partridge has entries for KECKS in his Dictionary of the Underworld and the supplement to his Dictionary of Slang and Unconventional English. Interestingly, Partridge traces this British meaning back to the 18th century, as well as citing some 19th-century US sources. Anyway, be that all as it may, there is a solitary noncrashing isomorph of INDIANA nestling in the pages of Webster's Third. It is GANGSAS, the plural of the noun GANGSA.

One of the isomorphic pairs Susan offers is OHIO/THAT, but these words have a crashing H. There are many noncrashing isomorphs for OHIO, some of the commoner ones being AREA, BLOB, DEAD and GANG.

In his "Patterns of Statenames" article in November 1977, Ross Eckler noted that there were no isomorphs for the statenames CONNECTICUT, MASSACHUSETTS, MISSISSIPPI and PENNSYLVANIA. Neither LeXpert nor Webster's Third is able to plug these four gaps. The nearest that they come is with the following isomorphs:

cONNECTICUT/APPLOSIONS   MASSACHUSEtts/BARRACKERS
MISSISSippi/PALLALL   PENNSYLVANIa/COLLAPSIBLE

The first and last of these are especially noteworthy as only one letter has been sacrificed in each case.

In the section of her article subtitled Designer Isomorphs with Doubled Letters, Susan offers various isomorphs having double letters. She offers the four-word mutually noncrashing group CESSPOOL/DOLLBEER/GARROTTE/TUPPENNY. The second of these words, DOLLBEER, has been lifted from Webster's Second Edition; a more modern example could be used by exchanging it for KILLDEER from Webster's Third. Better still, the group can be upgraded to a five-word noncrashing group: BATTILLS/FREEBOOT/KILLDEER/TERRAZZO/MOZZETTA. Given that LeXpert offers 31 words sharing this pattern and Webster's Third has 88 (though not all are solidly spelled), it may be possible to create a six-word noncrashing group. Webster's offers the interesting SKAAMOOG, but I've not managed to work this into a six-word solution.

Further on, in the section Geometrical Words (Triangles), Susan offers the five-word group MISSIS/WEDDED/HORROR/FALLAL/LYNNYN. Careful mining of LeXpert allows this to be extended to a six-word group: BUSSUS/DITTIT/WEDDED/HORROR/FALLAL/LYNNYN.

In the section Geometrical Words (Pentagons), Susan offers the three-word group DEADHEAD/ GINGLING/HOCHPOCH. As GINGLING is an obsolete form of JINGLING, it may be better to replace it with the more recent GANGBANG, courtesy of LeXpert.

In the section Geometrical Words (Trapeziums), Susan offers the two-word group AZZAZ/SEESE. I note that AZZAZ is a placename taken from The Times Index Gazetteer and that SEESE is a 15th-century variant form of the simple word "sees" taken from the Oxford English Dictionary. This pair could be replaced by a more accessible pair of isomorphs: AGGAG/ESSES. AGGAG is from Webster's Third, and ESSES is simply the plural of "ess" listed in many dictionaries. It's interesting to note that you could put together two of these three words to provide a noncrashing pair of isomorphs using just two different letters: ESSES/SEESE.

In the section Reversals (Reverse Isomorphs), Susan seeks noncrashing reverse isomorphs for the US statenames—for example, MONTANA/POPCORN. No reverse isomorph has been offered for ARKANSAS, but a quick check of LeXpert reveals SESTERCE. Unfortunately, being reversals. The S's crash, so the pair doesn't count as noncrashing! Ah, well!

In the section Special Patterns (Identical Trigram Heads and Tails), Susan offers the pair INSULINS/GALENGAL. LeXpert provides us with 17 words having this pattern (including INSULINS but not the OED-only GALENGAL, listed only as an obsolete form of GALIN-GALE). This noncrashing two-word isomorph could be updated and extended to the six-word set INSULINS/HAWKSHAW/BEDAUBED/EINSTEIN/OKEYDOKE/STAROSTA of noncrashing isomorphs.

In the section Special Patterns (Identical Tetragram Heads and Tails), Susan offers the pair OUT-SHOUTS/RESTOREST. First off, RESTOREST doesn't actually appear in print anywhere in the OED. It is, of course, the assumed –EST form of the verb RESTORE. A better two-word solution would be OUTSHOUTS/GALENGALE; both these words are findable via LeXpert. But this can be extended to a three-solution, GALENGALE/EINSTEINS/OKEYDOKEY, again courtesy of LeXpert. A check of Webster's Third enables this three-word group to be extended to a four-word group by the addition of MUCKAMUCK.

In the section Special Patterns (Reverse Trigram Heads and Tails), Susan offers the pair SCIAT-ICS/REVOLVER. This can be extended easily up to the three-word level by the addition of MARJORAM. Better still, the following noncrashing four-word solution is also possible: EVINCIVE/RENOWNER/MARJORAM/STEMLETS. A fifth noncrashing word can be added by noting that Webster's Third contains DRAWCARD.

In the section Special Patterns (Memnon Words), Susan offers MEMNON/GIGOLO/USURER. This can be extended to the noncrashing set MEMNON/GIGOLO/USURER/EMESIS/TOTARA. Webster's Third allows this to be modified and extended to a non-crashing six-word set, thus: MEMNON/GIGOLO/USURER/TOTARA/ARADID/EGESTS.

At the end of her article, Susan notes that both WEBSTER and MERRIAM have a number of isomorphs. To the WEBSTER list can be added its transposal BESTREW (courtesy of the OED and Webster's Second Edition), and to the MERRIAM list can be added its transposal RAMMIER (courtesy of Webster's Third and LeXpert). Neither pair is noncrashing, though.

My thanks to Susan Thorpe for vetting this article, and suggesting a few corrections.