# The Journal of Wordplay



#1 • May 2023

**Are AIs Funny (Yet)?**
**Winning at Wordle**
**One-Line Haiku**
**Spoonerisms**
**Cinderella A to Z**
**Verse Puzzles**
**Lipograms · Isograms**
**Kangaroos · Acrostics**
**...and more!**

**PLUS:**
**Richard Lederer**
**Will Shortz**

THE JOURNAL OF WORDPLAY

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**Editor:**

T Campbell

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## HELLO, ALL!

T Campbell
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What, just “hello”? Why didn’t I go with a showier greeting, like “salutations” or “aloha” or “S.P.D.S.V.B.E.E.V.”? Well, there’ll be plenty of time to show off with language later in the publication. For the intro, let’s keep things simple.

This publication is here to turn an intellectual eye to fun with words. Any type of wordplay is fair game, from the well-known *anagram* (aka the *transposal)* to the obscure *zeugma* that you maybe sort of remember from high school English. (Get back here, you can look it up when we’re done!)

In many word ways, *The Journal of Wordplay* is carrying on for *Word Ways: The Journal of Recreational Linguistics,* and its interim replacement *Interim,* preserving a tradition that goes back to 1968. In these pages, you’ll see many *Word Ways* contributors offering up spoonerisms, alphagraphic arithmetic, simple puzzles, and much more.

But preserving that tradition is not our only goal. The 2020s have brought many new facets to language that can be studied through play, from AI and app design to greater acceptance of the singular “they.” We’ll seek to stretch out into new territory, such as language’s interactions with visual media and the various sciences. As a primarily online publication, we have the option to use color, an avenue that *Word Ways* generally didn’t explore.

We are also interested in republishing research from elsewhere that reflects our mission. Some works have been released with Creative Commons agreements that grant permission for such reproduction, but we’ll also try to obtain permission for republication where those licenses don’t exist. Of course, that won’t always be feasible, but our “Further Reading” section will direct you to pieces we can’t include ourselves but don’t want to ignore.

You’ll see my byline a fair bit in this issue, and perhaps the next few, as well. That’s not just due to ego! I promise! The old *Word Ways* was chock full of material, exploring every nook and cranny of the language. I want to do everything I can to make sure *TJoW* does the same. In time, I plan to scale back my own writing for the publication a bit, as other voices, new and established, take more active roles.

But I look forward to a long run with it. We’ve got a lot to talk about.

## ONE-LINE HAIKU

Lori Wike

ID LEERED, THERE ALCHEMISTS SWEPT

The one-line haiku is a new wordplay form, consisting of a single line of black and red text. It could be considered a kind of minimalist puzzle haiku or perhaps just an economical use of letters: this particular haiku uses only 28 letters.

The single line above contains seven syllables and is the middle line of the haiku. The text in red consists of insider words within the longer line and is the first five-syllable line of the haiku. The leftover letters in black contain the third line of the haiku and also consist of five syllables.

The one-line haiku above would thus be read as:

IDLE RED MIST WEPT
ID LEERED, THERE ALCHEMISTS SWEPT
ETHEREAL CHESS

One can also compose a one-line haiku without the constraint that the red letters consist of insider words, although they are perhaps easier to read when the first line is constructed with these clear word divisions.

## TRIADS

Louis Phillips

This quiz invites you to come up with 3 words that are related by similar sounds or repetitions of a word. To wit:

1. A verbal mistake that reveals something about the speaker, a bathrobe, what a boy scout might tie?

2. Common colloquial speech, a horse galloping, and Saint Peter's entryway to Heaven?

3. A loud tearful sound, a foreign make of automobile, and a mean, nasty man?

(Answers on page 64…)

## THE APPLE-SAUCE CHRONICLES

Louis Phillips

*Editor's note: Here we continue a* Word Ways *tradition of brain-teasing miscellany…*

THE ANSWER: Josh Billings
THE QUESTION: How do you describe asking payment for jokes?

---

"This suit is not the right size," said Tom in a fit of anger.

"I am certain this hand grenade is going to go off," Tom exploded.

---

To Scott Baio, Europe is a good place to visit.

The above sentence contains the five vowels in a row.

---

Curriculumber: timber for learning

---

Want to go out and drill holes?
Naah. Too boring.

---

A scientist in Paris labored for years to create a human being in his laboratory. He took a mole from the shoulder of film producer Howard Hill and by manipulating the chromosomal structure he was able to build a French essayist. Now that's what I call making a Montaigne out of a Hill's mole.

---

What I'd like to see on a United States map:

A town named Distraction (Drive them to Distraction)
Cry me: a river

---

incomplet

---

As the Mafia said in the Old Testament:

Make them an Ophir they can't refuse.

---

Want to see the Billy Wider film — FEDORA?
Naah. It's old hat.

---

Palindrome:

Eye Pop, nod, nab a band on Popeye.

---

They loved horse racing, a mutuel passion.

---

Lois & Priscilla Lane drive their car into a fort.
Thus, the palindromic headline:

LANES RAM ARSENAL

---

SENTENCES

1. A sentence without a period is pointless

2. Is this short sentence short enough?

3. This sentence gets off to a good start but falls
o
f
f.

4. Can this sentence be summed up in nine words?

5. Whom do these words belong to?

6. If you read the words of this sentence in reverse order, the first word would be what.?

7. THERE IS NO CLEARANCE IN THIS SENTENCE. WATCH YOUR HEAD.

# SAMPLE MICROCROSTICS

T Campbell

Early this year, *The New York Times* announced that it would no longer be publishing acrostics online, though they are still in print. This cast some doubt over the future of this long-running puzzle institution, and I suggested a way it could survive in the digital age.

In puzzles, acrostics are quotes anagrammed into a series of unrelated (or mostly unrelated) words and phrases. The solver gets the smaller words from crossword-style clues and eventually solves the bigger quote. As a bonus, the first letter of each word spells out the attribution of the quote.

This means that the letters of that attribution have to be contained in the quote itself. For example, this quote…

"Stop worrying about your identity and concern yourself with the people you care about, ideas that matter to you, beliefs you can stand by, tickets you can run on. Intelligent humans make those choices with their brain and hearts and they make them alone."

…is from Zadie Smith's *On Beauty.* It's a great quote, but it can't be made into an acrostic, because it has no Z.

To minimize this problem, acrostics usually involve about twenty to twenty-five answers. But that's a lot to fit into a phone screen. Going with shorter quotes may be inconvenient, but is it *possible?* Of course it is. Here are a few examples I worked out:

**S**WIGS, **T**ETE, **A**RBORIO, **N**YMPH, **L**ITER, **E**PCOT, **E**ARWIGS = ***With great power comes great responsibility (STAN LEE).*** **7 letters.**

If you'd rather ascribe that one to his co-creation PETER, you can use **P**RISON SHIP, **E**ROTICA, **T**WITTER EGG, **E**LBOW, and **R**AMSEY. (PETER PARKER, UNCLE BEN, SPIDER-MAN, and SPIDEY don't work, though.) 5 letters.

**J**OE TORRE, **E**ATS DIRT, **S**WEENEY TODD, **U**NDER THE WIRE, **S**UBWAY FARE, **C**YBERCAFE, **H**IPPOCAMPUS, **R**ENEWABLE, **I** HEAR YOU, **S**EE HERE, **T**HEO VAN GOGH = ***Rejoice and be glad, because great is your reward in Heaven, for in the same way they persecuted the prophets before you (JESUS CHRIST).*** 11.

**D**ELI MEATS, **U**NIFORMS, **N**IFTIER, **E**LKHART = ***I must not fear. Fear is the mind-killer (DUNE).*** 4.

These are fun to play with, and I'm hoping to develop the idea further…once I get a little more time. Or maybe one of you will take it and run with it!

# ALPHAGRAPHIC ARITHMETIC

Anil
Perth, Australia

Alphagraphics is my name for giving a value to a letter based on the number of strokes in its capital. *(Per year?)* Technically, it could be called alphanumerics. I give it a new name because classical alphanumerics, which it resembles, means gematria or alphabet-position numerics. Stroke numbers, e.g., Z = 3, E = 4, R = 3, O = 1, have been played with before in *Word Ways,* I seem to recall, but I couldn't find any in Butler U.'s *Word Ways* search engine. Can readers remember? Google gives nothing for "letter stroke numbers" except a bunch of lithography articles.

**Alphagraphic arithmetic** resembles alphanumeric arithmetic but operates on stroke numbers. Here are alphagraphically truthful equations for zero thru ten. They're listed in decreasing order of strokes. All equations are elegant, i.e., they retain letter order.

| STROKES | NUMBER NUMBER | NAME | | SOLUTION | | |
|---|---|---|---|---|---|---|
| 16 | THREE | T+(H/R)(E/E) | = | 2+(3/3)(4/4) | = | 3 |
| 14 | SEVEN | (S+E+V)(E–N) | = | (1+4+2)(4–3) | = | 7 |
| 12 | EIGHT | E+I–G+H+T | = | 4+1–2+3+2 | = | 8 |
| 11 | ZERO | $(Z–E)^R+O$ | = | $(3–4)^3+1$ | = | –1+1 = 0 |
| 11 | NINE | N–I+N+E | = | 3–1+3+4 | = | 9 |
| 10 | FIVE | (F–I)/V+E | = | (3–1)/2+4 | = | 5 |
| 9 | TEN | –T+(E•N) | = | –2+(4•3) | = | 10 |
| 8 | ONE | (O+N)/E | = | (1+3)/4 | = | 1 |
| 8 | FOUR | F–O–U+R | = | 3–1–1+3 | = | 4 |
| 7 | TWO | (–T+W)O | = | (–2+4)1 | = | 2 |
| 4 | SIX | S(I+X)! | = | 1(1+2)! | = | 3! = 6 |

All but ZERO and SIX use only the four basic functions. ZERO uses a power, and SIX has to resort to using a factorial. FOUR, EIGHT, and NINE use only addition and subtraction. If we allow the letter order to be rearranged, **ZERO** can be solved with three functions, (3–3)(4+1), but I still couldn't improve any others that way.

It remains to solve ELEVEN and up by stroke arithmetic. They should be easier with all those extra letters, but I haven't tried. How many numbers can be solved with just addition and subtraction?

Note that no digit is self-truthful in having its own number of strokes. TEN is closest with 9. NINE = 11 is next. You can fudge and make TEN = 10 by counting the T as 3 strokes. The only genuinely truthful number word is TWENTY-NINE = 18+11 = 29 strokes. SIXTEEN is close at 17 strokes. Numbers thirty and up are larger than number names can reach. THIRTY-THREE = 14+16 = 30 is closest.

Interestingly, no digit is spelled with the ABCs! They're all from the D-Zs. The same is true of all numbers below a thousAnd. (Unless you count one hundred And one, etc.)

# WORD LIPOGRAM SENTENCES: COMMONEST WORDS; PRONOUNS

By Anil
Perth, Australia

I suggest the name "word lipograms" for constructs (phrases, sentences, even whole novels) created from a limited but narrowly defined pool of words — not letters as in classic lipograms. I used it in my two *Strange Bedfellows* books (2019-20), using pools of etymologically related words alone to make phrases and sentences. Word-unit palindromes are a special case of word lipogram.

Here I introduce a new type of word lipogram and another field of constrained writing: making a sentence out of only very common words. Specifically, I've tried to make a sentence of the fifteen commonest English words, *in order*, according to Eckler (WW 1987 p.169). They are:

the, of, and, to, a, in, that, is, was, he, for, it, with, as, his.

Here's my strained effort:

**The "of" and "to a" in that "is" was he, for it (with "as") = his!**

The details **[of** (origin and kin), **to a** (direction and goals), with **as** (causes and likenesses)] of whomever that previously mentioned "is" referred to were our protagonist's details, hence they were and it was he!

Any buyers out there? It makes sense in my twisted mind. Have you seen anything like this before? Perhaps you could have a go at the next fifteen in order, which look harder: *on, be, at, by, I, this, had, not, are, but, from, or, have, an, they.*

I find the top 30 list revealing:

There's no **what**, so we don't question things much.

There's no **no!,** so again we tend to accept things. **Not** snuck in at 23rd, but it's mostly as in this sentence used for contrast, not objection. Likewise, **or?** almost missed the list at #27.

There's no **so,** so we don't often try to be logical or comparative.

There's no **she** or **her,** so, as is well known, we're overwhelmingly sexist. (Or we *were*, we hope!)

There's no **you**, **we**, or **us,** so we're mostly self-absorbed and/or feel isolated more than not. But it's not extreme, for **I** only makes 20th. Funny our self-centeredness, because the whole function of language is to communicate with **others** (63rd)! *(Not me, tho: I mainly talk to myself lately.)*

Jeff Grant could dig my sentence and contributed another "solution." I give it here, slightly modified (especially the translation), with his leave.

**The "of" and "to a" in that *is*. (Was he for it, with "as" his?)**

Maybe discussing a particular (legal?) statement (i.e. "that"), a man is saying its detailed import as defined by the "of" and "to a" in it is staying, or just "is." Was he nonetheless against it, having added an "as" himself? Or was he for it, with the "as" meaning verbatim, as is?

Here's another common-words lipogram sentence made purely of **pronouns**. No translation needed, except that it's egalitarian and uses "we" as a verb, meaning to call or include in "we."

**They who "we" him, "we" her. They who "we" us, "we" you. We we we!**

# HE'LL MOURN HIMSELF IN THE HATING

New Spoonerisms and Transposition Puns

DON HAUPTMAN
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A book published in April 2023 about deceptive survival tactics used by animals and plants is titled *The Liars of Nature and the Nature of Liars.* In June 2022, a newspaper reader commented on certain insects being miscategorized as endangered species with the quip "What bees these mortals fool." The motivational maxim "One Day or Day One?" lately appears on coffee mugs, posters, T-shirts, and other venues.

It's a genre that's always timely. For the inaugural issue of *The Journal of Wordplay*, I'm returning to my favorite recreationally linguistic topic: spoonerisms (where the initial syllables reverse) and what I call transposition puns (where other elements, usually entire words, exchange places). My first book, *Cruel and Unusual Puns*, was entirely devoted to the subject, and since then I've written 21 articles compiling examples.

Below, catching up after a temporal lacuna, are a chrestomathy of new specimens. As always, in each case, I Googled to confirm originality, hoping for the message: "It looks like there aren't any great matches for your search." Where I was anticipated, however, I captured sources and made attributions, insofar as feasible; see credits at end.

- Announcement at ComicCon when the appearance of a popular illustrator is canceled: *"I have woe, nerds."*

- It's a tradition that began centuries ago: Women whose husbands or lovers were far away wore pendant jewelry containing portraits of their beloved. This sentimental practice might be called *Pining, the Lockets.*

- The citizens of many urban communities routinely call for expanded recreational areas. But tax-strapped municipal governments are often challenged to fulfill such demands. The result: *Poor marks for more parks.*

- Children's book explaining the sorry state of American politics: *See Rot Spun.*

- On a happier literary note, a book of etiquette tips for kids: *Tessie Mabel and the Messy Table.*

- The recent severe stock-market declines took usually optimistic investors by surprise. Hence, a *pullback of the bull pack.*

- Those who allow their ambitious projects to *wither and die . . . dither—and why*?

- Domestic quarrels sometimes result in one partner becoming homeless, thus raising the question*: "Lose the house? Who's the louse?"*

- Biography of Michelangelo: *Brush with Fame and Fame with Brush.*

- I'd rather meet a *wild rhino* than a *riled wino*.

- Movie scenario: Fleeing mobsters hide out in a monastery. Proposed title: *He's Not Brother; He's My Heavy.*

- As I write, the acclaimed documentary *Turn Every Page* in still playing in cinemas. Maybe it will inspire a film about the annual convocation of sea birds: *Page Every Tern.*

For three decades prior to retirement, I was an advertising copywriter. That may be why I'm exquisitely sensitive to potential wordplay in business and marketing situations. Examples:

- Market-research service specializing in polling on controversial cultural issues: *Jan's Trender*.

- Pandemics and recessions have depressed tourism, to the dismay of many American businesses. Suggested slogan to attract more foreign visitors: *"U.S.? Oo, Yes!"*

- Idea for Starbucks' campaign catering to office workers: *Cold Brew for a Bold Crew.*

- *The Mail on Sunday* is a conservative British tabloid, the largest-circulation Sunday newspaper in the U.K. An enterprising retailer might purchase ads therein promoting *"The Sale on Monday."*

- Nearby, a hypothetical London wellness center: *The Art of Healing in the Heart of Ealing.*

- Demand for sex counselors is a burgeoning trend, according to news reports. Suggested slogan for an ambitious and didactic practitioner: *"Lust missin'? Must listen!"*

- For a downscale casino: *"Get your butt here—and bet your gut here."*

Finally, from a 2021 article in *The New Criterion*: "How many Americans pay attention to serious contemporary literature, art, or music? [Perhaps] one-half of one percent of the population. . . ." This sobering statistic raises the question: *"Culture of fear—or fear of culture?"*

*CREDITS: The author of the Nature book, Lixing Sun, told me that the chiastic title is his creation. "Bee": Howard DeLong, letter in The Wall Street Journal, June 15, 2022. "Bold Crew": Several coffee companies have used variations. "Culture": Two dozen or so references turned up; it might best be attributed to award-winning novelist Richard Powers, in a 2014 interview. It's surprising that searches resulted in no matches for "Sale" or "Ealing," both of which I thought are obvious marketing puns.*

# TOSSED IN TRANSLATION

DON HAUPTMAN
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When I was studying French in high school in the early 1960s, a ubiquitous cigarette advertising campaign sported the headline "Taste is Everything." It struck me that the French version of the slogan would be the more elegant "*Le Goût: C'est Tout!*" Indeed, Googling today reveals numerous French-language ads that use the slogan.

That was probably the origin of my quirky habit of translating English expressions, especially if the results proved to be amusing. Though I never achieved fluency (thanks, public education!), French became the chief vehicle for this peculiar obsession.

Observing that a purchase is expensive, I'm inclined to comment: "That must have cost *un beau centime.*" And when I tell people something I suspect they already know, I archly add: "Of course, this news might be *le chapeau ancien* to you." (A multilingual acquaintance prefers *un vieux chapeau.*)

On one occasion, a friend subjected to this treatment became confused and irritated, and chided me for violating the traditional rule that writers should avoid opaque foreign-language expressions.

Well, I riposted, that commandment doesn't apply to fake ones! I explained that I was joking.

The amusement (I think) stems from the fact that many English metaphors don't necessarily have the equivalent idiomatic meaning in other languages. And even when it's not a figure of speech, a mundane and quotidian phrase sounds classier—and delightfully pretentious—in translation. Moreover, the device can be surprising and intriguing.

Another example: For years, in a waggish mood, I've rendered "sugar daddy" as *el padre del azúcar.*

I found that the jest provokes laughter, even—or especially—among Spanish speakers, perhaps because it translates as "a father made of sugar."

One day, I Googled and discovered that there are numerous ways to say it in Spanish, none of which, alas, are my version. The best seems to be *papi dulce.* So in this case, the metaphor does translate. One of the alternatives that turned up is *el amante viejo y rico*, which means "old and rich lover." Ho-hum. That's literal and boring.

Returning to French, I recently imagined "wallflower" becoming *une fleur du mur.* Once again, the rhyme is mellifluous. A search generates many instances of the expression—in the context of interior decoration. The French say *faire tapisserie*, the same metaphor.

Finally, hearing an unusual tale, I might incredulously exclaim: "What A Strange Story! Or to cite the German acronym: *WASS?!*" Of course, there is no such acronym. But the German word for "what" is *was*, pronounced "vas."

Did I "invent" this type of humor? Or am I at least the first to analyze the phenomenon and compile specimens? In an attempt to find out, I again asked the omniscient Google. The internet has many sites aggregating hilarious "lost in translation" errors, such as the automobile named "Nova" that was cluelessly marketed in Latin America.

Such bloopers are unintentional. But what about doing it deliberately for fun? Do readers of *The Journal of Wordplay* have any thoughts? Other examples? Perhaps I will one day write a sequel. Stay tuned—or, um . . . *rimanere sintonizzati!*

## REVISION AND REVISIONISM: CONFRONTING MY TENSE PAST

Daniel Galef

Back in high school, some of the very first writing I ever published was in *Word Ways, the Journal of Recreational Linguistics.* My father had lent me his copy of Willard R. Espy's *An Almanac of Words at Play* (I must remember to give that back someday), and I was delighted to discover that, unlike many artifacts of the '70s — like disco or South Vietnam or Espy himself — the magazine still existed. My literary career began in 2013 with the handful of articles and poems I sent that summer to *Word Ways, Light Quarterly,* and my high school's own literary magazine, all copies of which I have tracked down and incinerated. O!, foolish youth! Now, ten years later (to the very day), I've been looking back at my humble beginnings and the even humbler progress I've made since and have started writing on wordplay again — and, in particular, saw the chance to revisit some of those early writings in the (now itself folded) *Word Ways.*

The below is a new poem-puzzle expanding on the first thing I ever sent *Word Ways,* a list of pairs of verbs in which the present-tense form of one is homonymous (or at least homophonous) with the past tense form of the other. One example of a pair is the verbs "hear" and "herd," since the past tense "heard" is homophonous with the present tense "herd." This creates a word-chain giving the impression that "hear" has a double past tense — you can make it past-tense, and then you can make it past-tense again. Of the fifty or so word pairs listed, here are a dozen or so written into the most natural mode of presentation: silly little poems. Note that each quatrain/each puzzle contains an inherent hint given by the rhyme scheme (as each quatrain uses the solution as an end-rhyme):

Homer was a shepherd, so they say, but could that be?
You'd think his sheep would wander, once alerted
their watchman couldn't watch them. But Homer didn't need to see,
as long as he **heard** what he **herded.**

Willie, the miller's son, was punished for climbing on the gears.
His father's worries soon were proved well-founded:
for, though he'd been sent off to bed, Will's cries soon reached his ears,
as his son was _____ despite being _____.

That ass at the salon messed up my hair last fall
(please understand, it's not just that I'm jaded:
she really *is* an ass — with ears and tail and all),
and she _____ as she _____.

I like my coffee black and bitter — just like life.
Each morning, once the liquor was extruded,
I'd sip and I would contemplate the coming morning's strife:
I _____ and then I _____.

A chicken's doomed — destined for deep frying, more or less,
but at least they do not know where they are headed.
Even when their head's chopped off, they never seem to guess
they're _____ just to be _____.

Houdini laid the hurdles out, then locked his shackles tight.
But soon... *Poof!* The audience was astounded!
The chains were gone — his legs were freed — he jumped with all his might!
No longer _____, he _____.

“Come out, come out, wherever you are!” I peeked behind the flowers,
and in the shed, and under the trash can lid.
You fellas sure are great at this! I’ve been searching for three hours!
But I’m not quite certain if you _____ or _____.

Two lost tourists asked me for directions, full of hope.
I have a flair for pranks, but it was tided
by duping just the one. The other, I gave the straight dope.
So only one was _____ and one was _____.

This fuzzy little creature was a present from Louise.
“What is that, fleece?” I asked. My heart was melted.
“What, can’t you tell by touch?” said Lou. I gave the plush a squeeze.
I _____ it: it was _____.

A bird walks into a bar and says, “Just put it on my bill!”
A talking duck’s impressive, but, to be candid,
he never pays. Yet these endangered species we can’t kill,
so him we _____, then him we _____.

“On college applications, athletes’ names get double weight.
So go take up some sport!” this nerd was scolded.
It doesn’t take much muscle to knock some pins down great;
I _____, and I was _____.

Our Timmy more than anything wanted a goldfish for a toy
(he only wanted to have one because our Will did).
So we found a silver minnow, and gave it to the boy,
first having been discreetly _____ and _____.

A masseuse can’t take back services but still must stay on watch
for frauds. “Hard luck, I’m broke!” a client pleaded,
but on deaf ears. With one swift motion to the crotch,
she _____ whom she had _____.

You can also put two into the same quatrain, though it’s still a hint that they rhyme with each other:

To smash your china once you’ve eaten is no mark of class,
and we’ve _____ why, as a waiter, I’m _____.
But I swallowed pride and laid the cheque amidst the broken glass,
and _____ all the stuff that you _____.

Some verbs even have triple past tenses!

We pirates all are master drillers, skilled with brace and bit,
and over foes our prowess we have lorded.
Before each battle, we would drill some plank and brandish it,
and we _____ what we _____ when we _____.

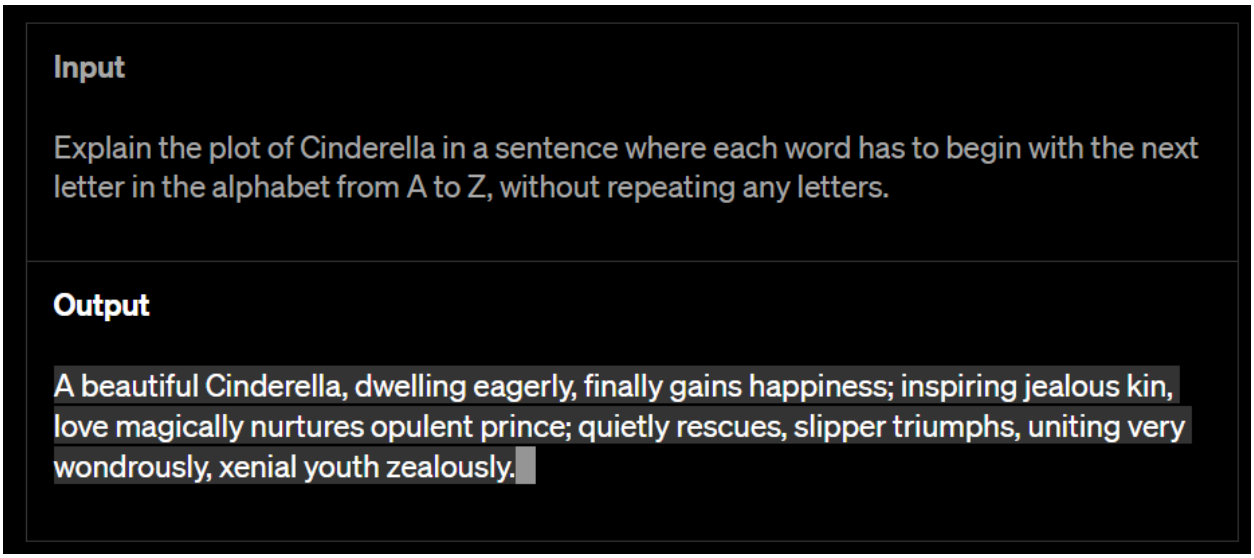
A knight-at-arms is iron-clothed and bearded like the pard,
but this costume’s not just dress-up (oh, how sordid).
I bore my armor into battle, and I marched in it at guard:
I _____ it, _____, and _____.

# JOHN-HENRYING GPT-4: CAN HUMANS OUTPERFORM AI AT WORDPLAY?

Part One

T Campbell

OpenAI has recently released GPT-4, which it claims surpasses ChatGPT on every level. The field of AI writing is exciting and terrifying to watch. At times it makes me feel like John Henry the steel-driving man, testing my own skills against those of the constantly advancing machines. And the example given on GPT-4's homepage certainly attracted this word nerd's interest:




This is an example of **abecedarian writing,** using a fairly tight constraint. Some abecedarian works are longer poems that begin each *line* with each successive letter from A to Z. Beginning each *word?* That's harder.

It's possible to read the original instruction and come up with a less-than-26-word sentence, something like "Fairy godmother hexes ingenue." But GPT-4 did it the hard way.

All things considered, this was a very good effort. The last few words were especially impressive. There are only small pools of x-words and z-words to work with, so getting one of each to play together is a challenge. The x-word was a new one on me, but we could all stand to be a little more *xenial* (welcoming to strangers and strange ideas, like the idea of marrying a commoner).

Although since "slipper" seems to be the subject in the last clause, "rescues" should really be "rescuing." And shouldn't there be another comma before "very"…?

Nitpicking aside, the more important question for me was whether humans could do better. I invited the readers of my Substack and social channels to try.

The results are encouraging. Here are the entries I received, in alphabetical order along with GPT's:

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"Awful bestial cinders!", denounced energetic fair girl. "How I jest, knocking life mine. Never onerous? Please!" Quietly, rats secure tights, undergarments, veils, while XL yashmak's zipped! (John Falcone)

“Arrogant broads,” chimed damsel ensconced, fearfully gone haywire in justifiably kooky lair, making nascent open prayers received soulfully, thoughtfully, until vapid wishes xeroxed yield zephyr. (John Falcone)

A bad Cinderella did everything fun--got high, ingested junk, killed lice... Midnight News!: Onerous peasants quickly ran straight toward “Underella’s” village while xylophones yipped zanily. (David Moen)

A baffling conundrum: Do effervescent fairies give harassed intellectual junior kissable lasses means, nearing object person quickly round securable tall uppity vested worthy xenophobic yachtsmen zestily? (John Falcone)

A ball? Cinderella’s desperate; enter Fairy Godmother. Heroine, in jubilation, knowing limit’s midnight, nearly overstays. Prince’s quest: revisiting slipper-wearers, trying until... victorious! Wedding’s xenial, years zoom. (Lowdown Letter Banks)

A basketball Cinderella dreams eternally for glory, heaving impossible jumpers, knowing longshots mostly never obtain precious quest, rather stressing teamwork, underdog vitality... Xavier yearns zenith! (John Falcone)

A beautiful Cinderella dances. Earlier, fairy godmother helped impressively. Junior king loves mystery night outing. Plentiful questioning regarding shoes, toes. Ultimately, wonderful victory. Xylophone yellow zebra oh god I’ve had a stroke (Chris Kultzow)

A Beautiful Cinderella, Duly Enthusiastic, Famously Gouging Her Irritating Kinfolk, Leaves Manly No Option Prince Quick Recovered Slipper Triumph, Undoing Vanity’s Woes, X-posing Youthful Zestiness. (Lee Croft)

A beautiful Cinderella, dwelling eagerly, finally gains happiness; inspiring jealous kin, love magically nurtures opulent prince; quietly rescues, slipper triumphs, uniting very wondrously, xenial youth zealously. (GPT-4)

Abused beauty crashes dance. Enchantress facilitates gatecrash heist. In jazzy kicks, lady makes noble overtures princeward. Queenship readies search to uncover vixen’s wearabouts, eXamining YeeZys. (Monica Marier)

All believe crystalized dressy ergonomic footwear ground heels into jeweled knuckled lumps, mashed nervously. Our princess quelled radically such thoughts using verified worldliness, X-Men’s youthful zest. (John Falcone)

Always, by Cinderella’s decree, every fairy godmother had input jarringly kindling love; making no open prophecies/quaint resolutions, save to undermine veritably wasteful xanthic yellow zealots. (John Falcone)

Angelic beauty craves dance. Enabler: fairy godmother. Her instruments joyfully kindle love. Magic named often. Puzzled Queen responds sarcastically, “This underling visits with Xanax, young zombie.” (John Falcone)

Angst burdened, Cinderella daintily emerged from galley’s hellfire incessantly jig kicking, lightly moved, never ominous, perpetually quick regarding secret tales upon vested waifs xylomancing yesterday’s zealots. (John Falcone/Rose Falcone Dowie)

Another brazen concubine dances ethereally, faking grand hallowed intimations, judicially knowing late meanderings near one pumpkin quiet random silliness; toss usurped vestments wayward; x-ray yonder zealotry. (John Falcone)

At brilliant cotillion, debutante employs fairy godmother's help, impeding jealous kin; love magically nabs opulent prince, quartz resembling slipper's timely use validating wondrously xenial youths' zeal. (Peter Baranowski)

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You will no doubt have your favorites; I have a tough time choosing. But in the scholarly spirit of *The Journal,* I intend to conduct a double-blind taste test, taking a selection of six to eight (GPT's among them) and seeing which of them strikes an unfamiliar audience as the best and funniest.

I *intended* to have the results of that taste test ready for the first issue, but inexperienced as I am with such tests, I underestimated the logistics involved. (I can't just post it online because that wouldn't be double-blind: most people who follow me are likely to have seen the original challenge.) Still, I'm setting this up now and will present the results in the second issue of the *Journal.*

# STATE LINES

Results of the Two-Week Creative Competition of Aug. 7 & 14, 2022
By Will Shortz

*Editor's note: In addition to his well-known work with crosswords, Will Shortz appears on NPR's* Weekend Edition Sunday, *where this contest was conducted.*

The object was to write a sentence using only the letters of any particular U.S. state, repeated as often as necessary. Entries were judged on originality, sense, naturalness of syntax, humor, and overall elegance.

More than 1,200 entries were received, averaging about two sentences each, resulting in more than 2,000 sentences altogether. The most common states used were Minnesota, West Virginia, and Rhode Island. Every state was used at least once.

Below are the winner, six runners-up, and 50+ honorable mentions.

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**Winner**

West Virginia: In tennis news, a new era starts as Serena is retiring. — Kate Simpson

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**Runners-Up**

Minnesota: NASA insists men on moon missions met no sentient E.T.s. — Stacey Wakeham

Massachusetts: At the museum, esthetes hate the cute statues that amuse the masses. — H.S. Hughes

West Virginia: Serena's stinging tennis serves, never average, win sets. — Joseph Kuperberg

Minnesota: No one tests Nastase in tennis: one set to none. — Emily Simon

Rhode Island: Denise hoarded sand and seashells inside her shoreside diner. — Rawson Scheinberg

Washington: Shania Twain is in town tonight, singing Gaga's hit songs at Santana's San Antonio gig. — Kerry Fowler

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**Honorable Mentions**

Virginia: Arriving in a van again, I ran in vain. — Bobby Jacobs

Wyoming: I now own my own gym, O my. — Jim VanValen

Pennsylvania: Spies in vain see evil in any lie. — Deborah Loftus

Rhode Island: Donald's reasons are inane; he's a hardened liar and a real loser. — Frank Dukes

Minnesota: Moisten onion-tomato samosas in a mint-sesame miso to attain an intense taste, sans meat. — Carl Benson

Colorado: Load a car o' Coca Cola! — Isabel Urrutia

California: On-air, call-in fora call for rain for forlorn local flora. — Phyliss Greenberg

Massachusetts: Sue cheats as she mates at chess matches. — Andrea Jacobsen

New Hampshire: When Sen. Hassan is pissed, she swears. — Ben Schwartz

Texas: Texas axes estate taxes. — Charvaka Duvvury

Utah: A Tut at that hut hath a taut tutu, aha! — James Press

Rhode Island: Harold rode a rhino on a dare, / And landed on his derriere. — Donn DiMichele

Vermont: Never remove even one voter; no more venom. — Jenny Gelfan

Pennsylvania: As an insane nanny slays seven villains, an assassin pens a less evil plan. — Nicholas Wootton

South Carolina: That Satan's trust account lost a trillion in cash to Santa Claus is no consolation to Antarctica. — Nicholas Wootton

Maryland: A randy lad may dally. A manly man may land a lady and marry! — Michael Holmes

Pennsylvania: Sylvia pens a pensive analysis, as inane as any. — Astrid Mast

Minnesota: As I sit on a moist stone, I see some men moon a moose as its nose aims snot at me. — Dave Jones

Minnesota: St. Simon sees no mists. [note: a palindrome] — Em Blair

Nebraska: A sane banker breaks a barber`s brass saber near Arkansas. — B. Narendran

California: I call for rainfall for forlorn flora in fair California… I fail. — Adriana Duffy-Horling

West Virginia: I gave Vera a rare, sweet-tasting vintage wine. — Elizabeth Huck

West Virginia: Investing earnings at great interest rates nets vast nest egg. — Joseph Kuperberg

Michigan: Man, I am a mahi mahi chimichanga maniac! — Brett Hunkins

Washington: On a hot night in San Antonio, as I sat noshing on tahini wings with Shania Twain, I saw Tonto's ghost shooting at Tintin, who sat on a waist-high swing. — Charlie Southwell

Minnesota: Tintin sits in a Mini, sometimes eats mints, sometimes not. — MaryAnn Gernegliaro

Rhode Island: Harrison as Indiana in *Raiders* series is an odd (and old) hero. — Janet McDonald

Washington: Nothing is showing tonight (hashtag: ghost town). — Sam Levitin

North Carolina: Ron, North ran Iran-Contra. — Robert O'Rourke

Massachusetts: The Hassam statuettes at the Tate Museum amuse me as much as the Met's Cassatts. — Kerry Fowler

Rhode Island: He laid his hands on her head and healed her diseases. — Jean Kendrick

Rhode Island: On a seaside in Ireland, Adele and Sean relished seasonal dishes à la seared eel, snails, sole in dill oil, sardines in a red onion salsa, and sole on a dandelion salad — so delish! — Zoe Scheuer

South Carolina: In a car, it's not cool to stall in a U-turn. — Deborah Malec

Minnesota: A moist onion is an insane taste sensation. — Keith Olson

South Carolina: Carol lost cash at an unusual coastal casino. — Anthony Pranger

New Hampshire: Here is where we raise Persian sheep, rams, ewes; we shear 'em near Maine. — Alexander Gori

South Carolina: Christian nationalists itch to torch Constitution to install uncouth autocratic lout. — Gail Merten

Idaho: Doh! Did I aid a dodo? Ha! — Ester Gubbrud

Rhode Island: Does she sell seashells on Rhode Island's seashores, or in Idaho and Ohio? — Carl Huber

Minnesota: Sometimes emotion is a man's nemesis. — Bill Piccinni

Idaho: Ha-ha. I had hid a dodo, Dad! — B. Narendran

South Carolina: Aroint, sirrah, thou art a lout, an arrant rascal! — Ted Kharpertian

Florida: I ROFL for Florida raid. — Stephen Newman

California: I can frolic in L.A. — Robert De Groff

Rhode Island: I heard Donald is an asinine liar and a lard-ass. — Brendan Tierney

Minnesota: I nominate no man… I see *me* in a Senate seat! — Lauren Dwyer

Rhode Island: "I see sand on a shoreline," she said. — Tarren van Ettinger

West Virginia: Waiters wearing giant earrings serve vintage wines in Nigerian taverns. — Curtis Johnson

Michigan: I'm imagining a Ghanaian magician chancing a gingham chimichanga in Miami. — Don Desrosiers

Minnesota: "It is ten a.m. tea time in Montana at noon in Maine." — JoMarie Privitera

Massachusetts: As she teaches math, she must use the state tests that she hates. — Rick Cleary

## CONFESSIONS OF A VERBIVORE

Richard Lederer

For more than six decades, I've experienced the joy of writing about language — from puns to punctuation, pronouns to pronunciation, diction to dictionaries, and palaver to palindromes. From the time I began pouring my words about words into textbooks, journals, and books, I have always felt that I was writing about the most deeply human of inventions — language. Words and people are inextricably bound together. Whether the ground of your being is religion or science, you find that language is the hallmark, the defining characteristic that distinguishes humankind from the other creatures that walk and run and crawl and swim and fly and burrow in our world.

Carnivores eat flesh and meat. Piscivores eat fish. Herbivores consume plants and vegetables. Verbivores devour words. We love tasting and digesting words. Sometimes we eat our words.

Some of us are intrigued by the birth and life of words. They become enthusiastic, ebullient, and enchanted when they discover that *enthusiastic* literally means "possessed by a god," *ebullient* "boiling over, spouting out," and *enchanted* "singing a magic song." They are rendered starry-eyed by the insight that *disaster* (*dis-aster)* literally means "ill-starred" and intoxicated by the information that *intoxicated* has poison in its heart. They love the fact that *amateur* is cobbled from the very first verb that all students of Latin learn — *amo:* "I love."

Then there's the breed of logophile who enjoys trying to turn the brier patch of pronoun cases, subject-verb agreement, sequence of tenses, and the indicative and subjunctive moods into a manageable garden of delight. Which is correct: "Nine and seven *is* fifteen" or "Nine and seven *are* fifteen"? The answer, of course, is "sixteen." Ha ha.

*Language* derives from *lingua,* "tongue," so it is no surprise that many verbivores care deeply about the pronunciation of words. The sounding *noo-kyuh-lur* has received much notoriety because a number of prominent people, including presidents of the United States, have sounded the word that way. Nonetheless, *noo-kyuh-lur* remains a much-derided aberration.

Among my favorite wordmongers are those who prowl the lunatic fringes of language. These recreational word players delight in how we English users are constantly standing meaning on its head. Thus, in our glorious, notorious, uproarious, outrageous, courageous, contagious, tremendous, stupendous, end-over-endous language, we drive in a parkway and park in a driveway, and our noses
can run, and our feet can smell!

Still another denomination of verbivore sees words as collections of letters to be juggled, shuffled, and flipped. Inspired by the word *bookkeeper,* with its three consecutive pairs of double letters, these logologists fantasize about a biologist who helps maintain raccoon habitats: a *raccoon nook keeper* — six consecutive sets of double letters — and another biologist who studies the liquid secreted by chickadee eggs. They call this scientist a *chickadee egg goo-ologist* — and into the world are born three consecutive pairs of triple letters.

Finally, there are the legions of pundits, punheads, and pun pals who tell of the Buddhist who said to the hot dog vendor, "Make me one with everything." That's the same Buddhist who never took Novocain when he had teeth extracted because he wished to transcend dental medication.

These pun-up girls and pun gents become even bigger hot dogs when they tell about Charlemagne, who mustered his Franks and set out with great relish to assault and pepper the Saracens, but he couldn't catch up. (Frankly, I never sausage a pun. It's the wurst!)

We wordstuck, word-bethumpt logolepts are heels over head in love with language. When I say *heels over head*, rather than *head over heels,* I am not two letters short of a complete alphabet or a syllable short of a coherent statement. *Head over heels* is the normal position, sort of like doing things ass-backwards, which is the way we do everything. I don't know about you, but when I flip over something, my heels are over my head.

When I say *language,* I mean by and large that incredible adventure that we call the English language. That's because in matters verbal I am unabashedly lexist. Just as many would say that, among many other things, the Italians do food well and that, among their many other accomplishments, the French do style and fashion well, I believe that we English speakers and writers do language especially well. One might say that we do it lexicellently.

May you continue to live a wordaholic, logoleptic, verbivorous life.

# ALPHAGRAMMATIC ISOGRAMS: 7 LETTERS

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For this article, I'm going to look at 7-letter words with no repeated letters — that is, 7-letter isograms. This article will explore some ideas around the alphagrams of those 7-letter isograms. In two later articles, I will extend these ideas to different-length isograms — those of 2 to 15 letters.

Before I go any further, I'd better remind readers what an alphagram is. An alphagram is the ordering of the letters of a word alphabetically — for example, *AEGINRT* is the alphagram of **GRANITE**, **TANGIER**, **TEARING,** etc.

So, the remainder of this article is about the alphagrams of 7-letter isograms. To avoid continually referring to "7-letter alphagrams" and "7-letter isograms," for the rest of this article I shall just refer to "alphagrams" and "isograms," with the "7-letter" part understood. Additionally, to distinguish between alphagrams and isograms, I will italicize alphagrams (for example, *AEGINRT*) and embolden isograms (for example, **GRANITE**).

How many alphagrams, with no repeated letters, are there, regardless of whether there are real words corresponding to them? To choose 7 different letters, first off, calculate the number of different ways of selecting 7 letters — this is 26 x 25 x 24 x 23 x 22 x 21 x 20 (3,315,312,000 to be exact…a tad over 3 billion). Then divide by 7 factorial (=5040). Thus, 3,315,312,000 divided by 5040 = 657,800. This tells us that there are 657,800 different alphagrams. When all are sorted into alphabetical order, the very first is *ABCDEFG*; this is followed by *ABCDEFH*, then *ABCDEFI*, and so on. The very last is *TUVWXYZ*. Given that there's an even number of alphagrams, the midpoint of all these 657,800 alphagrams lies halfway between the 328,900th alphagram and the 328,901st alphagram.

(Mathematical note: The general formula for the number of different alphagrams for n different letters is (26! x (26 — n)! / n!), where the exclamation mark signifies a factorial. In the extreme case of 26 different letters — the whole alphabet — there is only one alphagram. Putting n=26 into the above formula demonstrates that 0! (zero factorial) equals 1. While this may seem surprising, this is mathematically correct.)

How many of these 657,800 theoretically possible alphagrams correspond to real words? The simple answer is…I don't know! However, I have a booklet entitled *A List of Words Containing No Repeated Letters*, by Jack Levine — produced probably in the 1950s or 1960s for many of the popular wordplay competitions around then. This is based on the second edition of *Webster's New International Dictionary* (W2) and contains approximately 10,800 words of 7 letters. Allowing for additional isograms which have come in via *Webster's Third New International Dictionary* (W3) and the *Oxford English Dictionary* (OED), it wouldn't be unrealistic to suggest that there may be 20,000 isograms. But many of these will be transposals of others, which means that they would share alphagrams. I would suggest that 20,000 could be the upper limit on the number of alphagrams that correspond to real words, with a more likely figure somewhere between 10,000 and 15,000.

Which is the first alphagram which corresponds to a real word in regular dictionaries? And which is the last? And which two real-word alphagrams are nearest to the theoretical midpoint, either side of that midpoint? The answers to these questions will likely vary depending on which specific dictionaries are consulted.

Using W3 the first alphagram corresponding to a real word is *ABCDEHT* (**BATCHED**), but using W2, the first real-word alphagram is *ABCDEHO* (**COBHEAD**). The OED offers a possible improvement — it lists BANCHE as a verb, but notes that it's a misreading of HANCHE, meaning "to snatch"; so possibly **BANCHED** would correspond to the *ABCDEHN* alphagram. Are there improvements on these, corresponding to alphagrams somewhere between *ABCDEFG* and *ABCDEHM*?

We've already seen that the midpoint of the 657,800 alphagrams lies halfway between the 328,900th and 328,901st alphagrams. Following some very detailed calculations, these alphagrams have been identified as:

328,900th *CDHNRUY* 328,901st *CDHNRUZ*

A couple of familiar real-word alphagrams getting near *CDHNRUY* are *CDHIORS* (**ORCHIDS**) and *CDHIPTY* (**DIPTYCH**). W3 and the OED offer a word nearer still to *CDHNRUY*. Both of them provide us with *CDHLTUY* (**DUTCHLY**). The surname **MURDOCH** (*CDHMORU*) comes even nearer to the alphagram midpoint, appearing in *Collins English Dictionary*.

Initially, I thought that the nearest real-word alphagram coming after *CDHNRUZ* would be *CDIKNOR* (**DORNICK**, a type of fabric, in W3 and OED). Then I lighted on *CDHORSU* (**SCHROUD**, an obsolete spelling of SHROUD in the OED). Are any improvements possible over **MURDOCH** and **SCHROUD**, using any of W3, W2, and the OED?

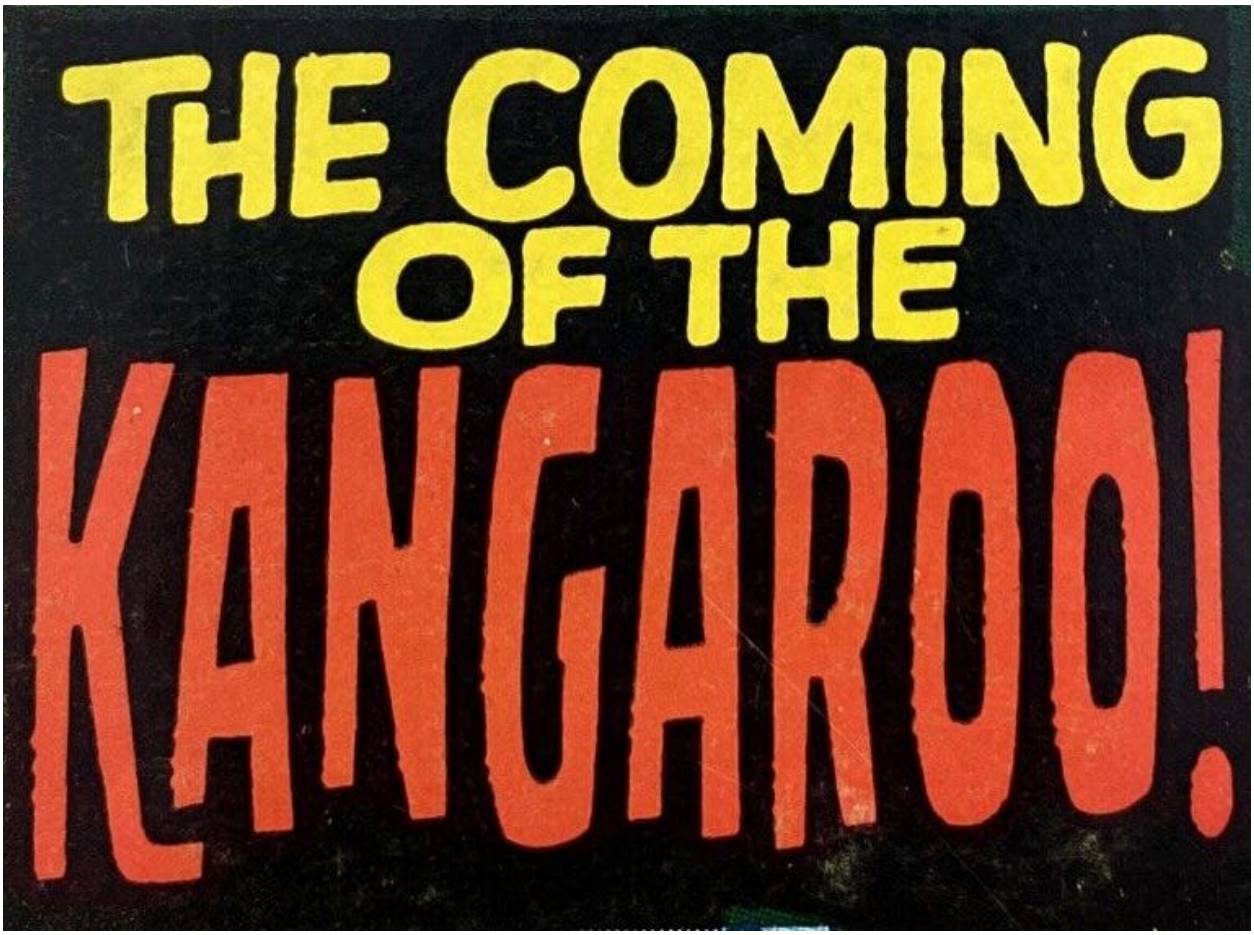
What about the last alphagram? The last theoretically possible alphagram is *TUVWXYZ*, but obviously, there is no real word corresponding to this alphagram. So, what is the last real-word alphagram? My first thought was *NOPSTUW* (**UPTOWNS**), courtesy of both W3 and OED. But further on is *NORSTUY* (**SUNTORY**, a type of Japanese whisky, courtesy of the OED). I had hoped to find the word **SPROUTY** in one of our regular dictionaries ("like a sprout," perhaps), but it's in none of them. But strangely, it turns out that **SPROUTY** is a type of protein (first found in sprouts, maybe?). Although it's outside of our regular dictionaries, Wikipedia provides this highly technical description: "The protein Sprouty is a developmental protein involved in cell signaling. It works by inhibiting the MAPK/ERK pathway."

Just a reminder…this article has concerned itself solely with alphagrams of 7-letter isograms. I have extensive results for alphagrams of isograms of length 2 to 15 letters. I am hoping to publish two further articles — one for alphagrams of 2, 3, 4, 5, and 6-letter isograms, and a further one for isograms of 8 to 15 letters.

My thanks to Nina Warwick (of Peterborough, England) who did sterling work helping to identify the two alphagrams adjacent to the midpoint of all 657,800 alphagrams.

## MARVEL KANGAROOS

T Campbell




When my wife Janice and I got out to see *Ant-Man and the Wasp: Quantumania,* we were old hands at watching Marvel movies. I'm a comics writer with a single Marvel credit to my name, but you don't have to be one of those to know Marvel's cardinal rule: stay for the mid-credits and end-credits scenes. I enjoyed what I saw. But it was the *start* of the credits that brought the biggest smile to my lips.

Footage from these end credits is not yet available outside theaters, so I'll approximate the effect as best I can from what *is* available. The end credits started with ANT-MAN…




And then got to this…




Do you see it?

The title of the franchise as a whole is hidden inside the movie's subtitle. QU**ANT**U**MAN**IA. What's more, it's hidden symmetrically, with two letters on either end and a "U" taking the place of Ant-Man's usual hyphen.

This is similar to what word lovers call a *kangaroo word*, a larger word that contains a smaller word's letters in order but not necessarily all together. The kangaroo's "joey" is usually a synonym for it, as in acc**us**tom**ed to**/used to or **fe**aste**d**/fed…and also fe**as**t**e**d/ate. But I think we can broaden the definition to two words or phrases, one containing the other, that have a relationship of *meaning.*

As it turns out, Ant-Man has a history with kangaroos! In the comics, Hank Pym, the original Ant-Man, changed his code name to GI**ANT-MAN** for a while.




Hank may have been the first superhero to shift into a shorter or longer version of his codename. He's not the only one, though. Wally West began his hero career as Kid **Flash,** a junior partner to the Flash; he eventually took the **Flash** name as his own. Tim Drake started out as the third **Robin,** then went by Red **Robin** for a while. And when **Captain** America was at odds with the U.S. government, he went through a phase of calling himself just "the **Captain."**

What is unique about Hank's changeover, to the best of my knowledge and recollection, is that his kangaroo codename had a nearly opposite meaning from its joey's. If you've watched the later movies, you know Ant-Man gets big as well as small, but the *name* "Ant-Man" suggests "this hero gets small," whereas "Giant-Man" says only "this hero gets big."

(DC Comics came *close* to copying this, decades later. One of its giant heroes goes by **Atom** Smasher, and he's the son of a notably short superhero called the **Atom.** The latter also inspired other heroes named the Atom, who actually shrink themselves like Ant-Man does.)

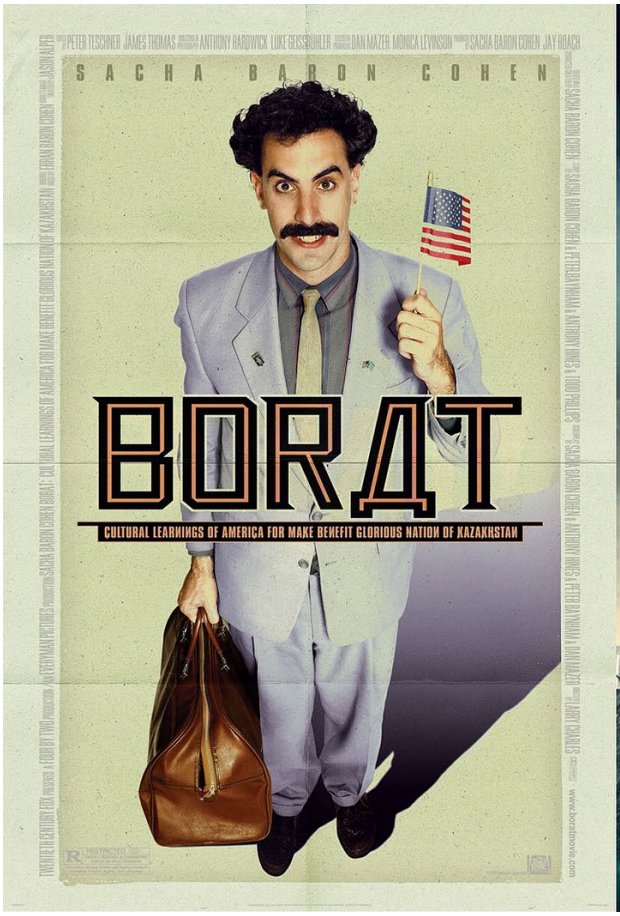
It's as if **Superman** decided to stop being a humble servant of humanity and became **Super**cilious **Man.** Or it's like a version of the **Joker** who didn't kill people for funsies and was just trying to make a living: the **Jo**b-See**ker.** Of course, neither of those things would ever hap…




Well, you get the point.

In a *strict* sense, the *Ant-Man* movie doesn't qualify as a kangaroo/joey pair. Its full title is *Ant-Man* ***and the Wasp:*** *Quantumania.* Are there any other movies that do?
To answer that question, I looked at Wikipedia's list of film titles, then at 46,337 movies. Of those, 8,462 had subtitles. Searching those and discounting expanded abbreviations like ***D.O.A.:*** ***D****ead* ***o****n* ***A****rrival*…I found two.

And one of them is another Marvel movie!







*Borat! Cultural Learnings of America for Make **B**enefit Gl**or**ious N**at**ion of Kazakhstan* has a comically long subtitle that gets around to including B-O-R-A-T after its first seven words. *Thor: **Th**e Dark W**or**ld* is a lot more efficient.

Can a kangaroo's joey be a single letter? I don't see why not…although I think it only counts as *interesting* if there's a little surprise to it.

Consider these titles, from yet another Marvel property (produced by Fox) and two films in a Disney sports franchise. All three of them boil their franchise name down to one letter and attach a numeral to it as the main title, with the full franchise in the subtitle:

*X2: X-Men United*
*D2: The Mighty Ducks*
*D3: The Mighty Ducks*

Even if we discount the numerals, the letters aren't really *hiding* in **"X**-Men United" or "The Mighty **D**ucks." This is more like an acronym than a game of hide-and-find. It's the same reason I'm not counting ***DOA: D**ead **o**n **A**rrival.*

But X-Men comics stories do seem to use "x" words conspicuously often, even when they're not obvious about it. *E is for Ex**t**inction, The Phalan**x** Covenant,* and the filmed *Dark Phoeni**x** Saga,* for three. The X was also highlighted in the X-movies' FO**X** logos.




And in at least one Marvel release, a kangaroo word (with a single-letter joey) figures into the *plot.*

Several key scenes in *The Avengers* take place in Stark Tower, a monument to clean power…and a monument to the monumental ego of Tony Stark, Iron Man. When the tower's logo lights up for the first time, Tony describes it as "Like Christmas, but with more…me."




Some of Tony's self-regard gets stripped away over the course of the film: he goes from mocking the idea of self-sacrifice to making such a sacrifice. (He winds up not dying in that film, but he expected to.)



The letters of the STARK logo *also* get stripped away…all but one.



And the remaining “A” appears in the final shot before the credits. It is now no longer part of Tony Stark’s name, but the initial for the team that he serves.



I don’t know what it is about Marvel that makes this kind of wordplay keep coming up. Something about comics’ flexibility in their use of language, since the images do so much of the storytelling? The tradition of one-letter superhero symbols that goes back to Superman? Or is there something in the very creative *DNA* of Marvel that resonates with it?

It’s too bad all Marvel’s founding fathers are no longer with us. I’d love to pose that question to **Stanle**y Lieber…

…er, sorry. That was his birth name. I meant **Stan Lee.**

# FINDING NESTED BOOK TITLES

T Campbell

Which famous book titles appear, unbroken, inside other famous book titles?

To answer this question as thoroughly as I could, I assembled a master list of titles that seemed likely to be well-known.

- I integrated lists from *1001 Books You Must Read Before You Die,* TheGreatestBooks.org, and Wikipedia's list of bestsellers with minimal difficulty. The #1 chart-toppers from the *Publisher's Weekly* list were also added.

- The full list of *New York Times* bestseller titles was too much for me to manage, so I pulled in the #1 chart-toppers for each week in fiction since the list was founded in 1933 and the nonfiction chart-toppers beginning in 1968. Why such a late start with nonfiction? Because that's what Wikipedia had available for easy copying. If I'd had a little more time, I would have folded in the list of *NYT* chart-toppers by Hawes Publications, but I reasoned that most well-known books from more than 50 years ago are likely to be either fiction or listed through other sources.

The hard part was combing out redundancies and making sure the listed titles were what people would actually call the book. In a few cases, subtitles or variant titles are an essential part of the main title. A good example is *America: The Book* by Jon Stewart and *The Daily Show.* The subtitle adds a dash of Stewart's cheeky comedy and lets you know what to expect, much better than a single-word title like *America* could do. The shorter title would be a lot more useful to me (the "America" string shows up in 20 other books), but it wouldn't be honest to use it.

In most cases, though, leaving that extra material in wouldn't have been the best way to represent the book. Shakespeare's most popular play is called *Romeo and Juliet* in most places, even if *The Most Excellent and Lamentable Tragedy of Romeo and Juliet* was its full, original name**.** The cover of Stephen King's *It* sometimes reads *It: A Novel,* but nobody calls it that.

Lots of times, translation glitches or other problems resulted in more than one version of a book's title getting listed. I cut these wherever I found them, but a few have probably slipped by me. Charting dates and publication years were only available from some lists, but I kept that data, as they reminded me which list I'd pulled certain books from.

**Results**

I made searches case insensitive by copying all the titles, turning them to lowercase, and using an Excel function on the lowercase versions. However, I decided to keep spacing and punctuation: otherwise, the dotted initial titles *G., K.,* and *V.* would be a lot more prominent.

My final list of books, with all redundancies eliminated so far as I could see, was 6,497 entries. Of those titles, 531 appeared in at least one other title. Seventy-nine of the titles appeared at least ten times inside other titles. Here are the top 20:

| Title | Author | Times Featured | Length |
|---|---|---|---|
| Me | Katharine Hepburn | 684 | 2 |
| It | Stephen King | 543 | 2 |
| We | Yevgeny Zamyatin | 191 | 2 |
| If | Rudyard Kipling | 188 | 2 |
| X | Sue Grafton | 174 | 1 |
| One | Richard Bach | 157 | 3 |
| Z | Vassilis Vassilikos | 141 | 1 |
| Life | Keith Richards with James Fox | 109 | 4 |
| Day | A.L. Kennedy | 82 | 3 |
| Lit | Mary Karr | 76 | 3 |
| Stories | Heinrich von Kleist | 75 | 7 |
| Red | Sammy Hagar with Joel Selvin | 73 | 3 |
| Land | Kyong-ni Pak | 73 | 4 |
| House | Tracy Kidder | 69 | 5 |
| Night | Elie Wiesel | 69 | 5 |
| Win | Harlan Coben | 65 | 3 |
| Up | Ronald Sukenick | 60 | 2 |
| Poems | Paul Celan | 53 | 5 |
| History | Elsa Morante | 49 | 7 |
| Light | M. John Harrison | 43 | 5 |

At first, the genres seem inconsistent. *Me* is a celebrity memoir, *It* is a horror novel (with a side order of hurray-for-the-good-guys adventure story), and *We* is a dystopian sci-fi novel that some cite as an influence on *1984. If* is an inspirational poem, *X* is a mystery.

Looking at the whole top twenty, though, a couple of themes emerge. *Me, One, Life, Red,* and *Night* are all essentially memoirs, though *One* is a bit more of a "what might have been" version of Richard Bach's life. *Day,* Z, *Land, House,* and *History* are all historical fiction, and several of them are as epic in scope as a memoir, if not more so. It's tempting to conclude that it's the big, ambitious stories that favor short, generalized titles. *(War and Peace* says what?)

Unsurprisingly, short titles tend to get repeated most often, and the list favors pronouns. The top three entries here are *Me, It,* and *We. One* also places in the top six, and *She* is just outside the top twenty. More contemporary and popular-fiction books also seem highly placed, but that's probably correlated with the short titles: there aren't many older or literary books that have really short, punchy names.

*Lit* is one of the top twenty…and every entry that contains ***Lit*** also, of course, contains ***It.*** One book title that contains ***Lit*** is *Sol**it**ude,* which is found inside *100 Years of **Solitude;*** another is *Lo**lit**a,* found inside *Reading **Lolita** in Tehran.* These fourth-level nestings (a title inside a title inside a title inside a title) seem to be as complex a Russian doll as we can build.

Note that we're counting *appearances* of the title string in the list, not *books in which* the string appears. For most entries, this doesn't make much of a difference, but the two single-letter titles, *Z* and *X,* owe multiple appearances to entries like *Sizzling Sixteen* by Janet Evanovich and *Encyclicals of Pope John XXIII.*

The longest title found inside another title, discounting direct sequels and likely duplications, is Isaac Newton's ***Principia Mathematica,*** in Bertrand Russell's *The* ***Principia Mathematica.*** But those titles feel like minor variations of each other.

The longest strings otherwise tend to be names of famous historical figures like *Frederick Douglass, Ralph Waldo Emerson,* and *Theodore Roosevelt.* All of these are titles of biographies, and they hide within other biographies (of Roosevelt), collected writings (of Emerson), or both *(The Autobiography of* ***Frederick Douglass).***

And finally, a few new favorites I found with this method:

**The Really Good Stuff**

***Travels*** by Marco Polo in *Gulliver's* ***Travels*** (Jonathan Swift) and ***Travels*** *with Charley* (John Steinbeck)

***X*** by Sue Grafton in ***Sex*** by Madonna in *Joy of* ***Sex*** by Alex Comfort.

Ralph Ellison's ***Invisible Man*** shows up in H.G. Wells's *The* ***Invisible Man*** and Mychal Denzel Smith's ***Invisible Man,*** *Got The Whole World Watching.*

***Things*** by Georges Perec in *Needful* ***Things*** by Stephen King and ***Things*** *Fall Apart* by Chinua Achebe.

***Twilight*** by Stephenie Meyer in ***Twilight*** *Sleep* by Edith Wharton.

***Fear*** by Bob Woodward in ***Fear*** *and Trembling* by Søren Kierkegaard and ***Fear*** *and Loathing in Las Vegas* by Hunter S. Thompson.

Cormac McCarthy's ***The Road*** hides in Jack Kerouac's *On* ***the Road*** and six other titles…most famously, Bill Gates's ***The Road*** *Ahead* and Charles Kuralt's *A Life on* ***the Road.*** And Kuralt's book is hiding ***On the Road,*** too!

# WORDPLAY

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My wordplay journey continues! It began with Dmitri Borgmann's 1965 milestone book *Language on Vacation*, although Borgmann doesn't appear to have used the term "wordplay" in it, preferring a variety of other terms — *recreational linguistics, word diversions,* and *logology.* Borgmann followed up with a second book in 1967, *Beyond Language*, and the quarterly publication *Word Ways: The Journal of Recreational Linguistics* in 1968. Borgmann's editorship of *Word Ways* lasted just one year, with Howard Bergerson taking on the editorship for a further year. 1970 saw the editorship change yet again, this time with Ross Eckler taking the helm, which he retained for a full 36 years, until the end of 2006. The editorship of *Word Ways* then passed to Jeremiah (Jerry) Farrell, who edited the journal for a further 14 years, until finally discontinuing it at the end of 2020.

*Word Ways* had run continuously for 53 years, with a total of 212 quarterly editions — a superb and unparalleled collection of wordplay material. Then, 2021 saw the advent of a *Word Ways* successor — James Puder launched *Interim*, which as the title suggests was seen only as a stopgap publication until a more assured long-term replacement could be created. *Interim* was published for just five quarterly editions, halting in February 2022. Wordplay enthusiasts, recreational linguists, logologists — call us what you wish — no longer had a quarterly go-to home for our recreation.

But now, after a hiatus of just 15 months, there is a new kid on the block, *The Journal of Wordplay*. I hope we can all support publisher and editor T Campbell in this exciting new venture, ensuring it will prove a worthy long-term successor to *Word Ways* and *Interim*.

As regular readers and contributors to *Word Ways* and *Interim* will know, I love indulging in wordplay — transposals, all sorts of word and letter surgery, palindromes, new words, unfamiliar words, dictionary oddities, lists of words sharing some common property, and so on and so on, using an extensive collection of dictionaries and other word resources. The advent of *The Journal of Wordplay* gives me the opportunity to rekindle this word-related activity, so where better to start than to kick off with some wordplay involving the word "wordplay" itself?

Searching for transposals is a good place to start. As clunky as some of the letters may look — witness the W, D, P, and Y — I have managed to unearth seven transposals of "wordplay," summarized below.

| | |
|---|---|
| dray-plow | A particular kind of plow, this spelling appearing in the *Emily Dickinson Lexicon*, a dictionary of all of the words in Emily Dickinson's collected poems (edl.byu.edu) |
| Payworld | An Indian financial services company (Wikipedia) |
| Plow Yard | The name of three places listed in *A Dictionary of London*, by Henry A Harden, published 1918 |
| Polydraw | A matte surface polyester drafting film (www.saa.co.uk) |
| PolyWard | A UK company manufacturing mudflaps for vehicles (www.polyward.co.uk) |
| Worldpay | A payment processing company (Wikipedia) |
| yard plow | A term used in one specific advert for a diecast toy (eBay) |

A transdeletion involves the transposal of a specific word (in this case, "wordplay') minus one or more letters. Below are some transposals of "wordplay" minus a single letter. A complete set of transdeletions, where every letter can be deleted, is called a Baltimore transdeletion. I have only offered one example for each letter subtracted, but there are further examples for some of the subtracted letters.

| | | | |
|---|---|---|---|
| -W | > | Polyrad | A brand of wire and cables for advanced rapid transit, locomotive, and off-road equipment, produced by Prysmian Group (www.prysmiangroup.com) |

| | | | |
|---|---|---|---|
| -O | > | Plyward | The Plyward Grove Band is a musical group with a page on Facebook |
| -R | > | poldway | An old spelling of "poldavy," a coarse canvas or sacking, originally woven in Brittany and formerly much used for sailcloth (OED) |
| -D | > | Praylow | A family surname, with over 600 records on www.Ancestry.com |
| -P | > | Wlodary | A village in south-western Poland (Wikipedia) |
| -L | > | Dropway | The assumed name of an Algerian disc jockey specializing in dance mixes and mashups (YouTube) |
| -A | > | Plyword | A business in London specializing in creating 3D words and names made from eco-friendly sustainable plywood (Facebook, Instagram) |
| -Y | > | Waldrop | The surname of various individuals, including Howard Waldrop, a US science fiction writer (Wikipedia) |

A transaddition involves the transposal of a specific word (in this case, "wordplay") plus one or more letters. Theoretically, there are 26 potential single-letter transadditions, one for each letter of the alphabet, but I have only managed to find five, shown below.

| | | | |
|---|---|---|---|
| +C | > | Crowdplay | A gaming software provider (www.crowdplay.com) |
| +E | > | Powerlady | Powerlady Fitness is a female-only gym in Atlanta, Georgia, US (www.powerlady.com) |
| +L | > | Playworld | The name of children's play centers in Crewe, Huddersfield, and other locations in England |
| +M | > | moldywarp | A 19th century spelling of "moldwarp," the European mole, *Talpa europaea* (OED) |
| +S | > | swordplay | The action of lightly and briskly wielding a weapon in fencing or combat (OED) |

Becoming rather more complicated, let's move on to substitute-letter transposals. A substitute-letter transposal involves the removal of a single letter from a specific word, "wordplay," replacing it with another letter, and then finding a valid transposal. In theory, there are 200 potential sets of letters to consider (8 different letters removed, each in turn replaced with 25 different letters). Here are 45 examples I've discovered, including a smattering of two-word terms.

| | | | | |
|---|---|---|---|---|
| -W | +A | > | polar day | At extreme northern and southern latitudes, "midnight sun" is usually referred to as "polar day" (Wikipedia) |
| -W | +B | > | plyboard | Board made of two or more thin layers of wood bonded together with the grain of adjacent layers crosswise (OED) |
| -W | +C | > | CordPlay | A design and fashion business (Facebook) |
| -W | +D | > | prodelay | An undefined word, presumably meaning "in favor of delay" (W2) |
| -W | +E | > | polyread | To read more than two books at once (www.urbandictionary.com) |
| -W | +F | > | Playford | A village in Suffolk, England (www.playford.org.uk) |
| -W | +I | > | pyraloid | Related to a moth of the genus Pyralis (W2) |
| -W | +N | > | Opryland | The colloquial name for Opryland USA, a Nashville theme park open between 1972-1997 (Wikipedia) |
| -W | +O | > | Polydora | In the *Iliad*, daughter of Peleus (Random House Dictionary) |
| -O | +A | > | playward | Given or inclined to play; playful (OED) |
| -O | +U | > | upwardly | In an upward direction; upwards (OED) |
| -R | +A | > | plod away | To continue to work on, progress through, or develop something at a slow and laborious but consistent pace (idioms.thefreedictionary.com) |
| -R | +C | > | Placydów | A village in central Poland (Wikipedia) |
| -R | +E | > | poldawye | A pre-1700 spelling of "poldavy," a coarse canvas or sacking, originally woven in Brittany and formerly much used for sailcloth (OED) |

| | | | | |
|---|---|---|---|---|
| -R | +N | > | downplay | To try to make something appear smaller or less important than in reality (OED) |
| -D | +A | > | Polarway | A Taiwanese company manufacturing glasses and goggles (en.maskeyewear.com) |
| -D | +K | > | playwork | Work involving plays or theatrical performance (OED) |
| -P | +B | > | wordably | In a way expressible in words (W2) |
| -P | +C | > | cowardly | Having the character or spirit of a coward (OED) |
| -P | +D | > | Dayworld | A science fiction novel by American writer Philip José Farmer, published in 1985 (Wikipedia) |
| -P | +F | > | Flowyard | A company providing cloud infrastructure (www.flowyard.com) |
| -P | +G | > | Glowyard | A username on Twitter |
| -P | +K | > | Worklady | The title of an article in the May 19, 1928, issue of *The New Yorker* magazine (www.newyorker.com) |
| -P | +M | > | Mały Dwór | A settlement in west-central Poland (Wikipedia) |
| -P | +N | > | onwardly | With an onward motion (OED) |
| -P | +O | > | Dóra Lőwy | A Hungarian handball player and Olympic medallist; she received a silver medal at the 2000 Summer Olympics with the Hungarian national team (Wikipedia) |
| -P | +T | > | towardly | Likely to lead to a desired result (OED) |
| -P | +W | > | worldway | A poetic term meaning "the highway of the world" (W2) |
| -L | +A | > | drop away | To fall away drop by drop, or one by one (OED) |
| -L | +B | > | bodywrap | A beauty treatment in which a person's body is wrapped tightly in cloth or plastic film, intended to improve the appearance of skin, encourage slimming, etc (Wiktionary) |
| -L | +E | > | Powerday | A London-based recycling and waste management company (Wikipedia) |
| -L | +M | > | modywarp | A variant spelling of "moldwarp" — the European mole, *Talpa europaea* (OED) |
| -A | +E | > | Powderly | A small city in Muhlenberg County, Kentucky (Wikipedia) |
| -A | +O | > | Polyword | A software-based wordgame (englishlanguageandhistory.com) |
| -Y | +C | > | Worldpac | A company that specialized in providing hard-to-find aftermarket parts for imported vehicles, and was acquired by the US Carquest Corporation in 2004 (Wikipedia) |
| -Y | +E | > | poleward | Towards a pole, especially a north or south pole (OED) |
| -Y | +F | > | dwarf lop | A breed of rabbit (Wikipedia) |
| -Y | +L | > | dropwall | A prefabricated wall that is supported by a framework (Wiktionary) |
| -Y | +M | > | moldwarp | The European mole, *Talpa europaea* (OED) |
| -Y | +O | > | road plow | An undefined term, but probably a snowplow (W2) |
| -Y | +T | > | Waldport | A city in Lincoln County, Oregon (Wikipedia) |
| -Y | +U | > | Waldroup | Derrick Waldroup is an American wrestler who competed in the 1996 Summer Olympics (Wikipedia) |
| -Y | +V | > | Polard WV | An unincorporated community in Tyler County, West Virginia, USA (Wikipedia) |
| -Y | +W | > | Wapworld | The first commercial mobile internet service to launch in the UK, eventually becoming part of Carphone Warehouse (Wikipedia) |
| -Y | +Z | > | Zapworld | A now-defunct electric vehicle manufacturer based in Santa Rosa, California (Wikipedia) |

There are very few transadditions of "wordplay" using two or more letters. Here are some I've uncovered.

| | |
|---|---|
| jawdroppingly | Astonishingly, amazingly (Wiktionary) |
| privately-owned | Owned privately (OED) |

| | |
|---|---|
| swordplayer | A person skilled in swordplayer, a fencer (W3) |
| swordplayers | The plural of “swordplayer” (W3) |
| sword-playing | An obsolete word for “swordplay” (OED) |
| swordplayings | The plural of “sword-playing” — this unhyphenated form appears in a 1587 quote at “sword-playing” (OED) |
| woollen-drapery | Wool goods, also a shop for the sale of these (OED) |
| world-paralyzing | Undefined in a list of terms at “world” (W2) |
| yellow-aproned | Undefined in a list of terms at “yellow” (W2) |
| yellow-papered | Undefined in a list of terms at “yellow” (W2) |

A successive transdeletion involves the consecutive removal of a letter and transposal of the remaining letters to generate a series of words, ending with a single letter. Beginning with “wordplay,” here is a series of deletions.

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| w | o | r | D | p | l | a | y |
| p | o | l | D | w | a | y | |
| p | o | l | Y | a | d | | |
| p | o | d | A | l | | | |
| l | o | a | D | | | | |
| l | a | d | | | | | |
| a | d | | | | | | |
| a | | | | | | | |

Two of these words probably need definitions — “polyad” (a group of more than two, or an indeterminate number of things or persons) and “podal” (of or relating to a foot or footlike organ). By extension, this successive transdeletion can be extended upwards by the addition of “swordplay” and “swordplays,” but that’s as far upwards as possible.

Let’s have a quick look at shiftgrams. First off, let’s revise word-shifts. As an example, take the word “cold,” and shift each of the letters three positions forward in the alphabet — the result is “frog.” So what about shiftgrams? If every shift of a word is regarded as a potential scrambled word, the possibilities of generating words by letter-shifting are opened up. As an example, if the word “word” has each of its letters shifted twelve places forward, the result is “iadp.” This can then be transposed to “paid.” Here are some examples based on “word,” “play” and, indeed, “wordplay” itself.

| | | | |
|---|---|---|---|
| word | 12 | Iadp | paid |
| word | 16 | Meht | meth / them |
| word | 23 | Tloa | alto |
| word | 24 | Umpb | bump |
| play | 2 | Rnca | carn / cran / narc |
| play | 3 | Sodb | bods |
| play | 15 | Eapn | nape / neap / pane |
| play | 19 | Ietr | rite / tire |
| wordplay | 15 | ldgseapn | spangled |

It seems particularly apposite that “wordplay” can be shiftgrammed to the appealing “spangled.”

I mentioned earlier that what Dmitri Borgmann called logology had become today’s wordplay. Via successive substitute-letter transpositions, I can demonstrate this transition here.

| | |
|---|---|
| logology | The science of words (OED) |
| algology | The branch of botany concerned with seaweeds and other algae (OED) |

| | |
|---|---|
| agrology | Soil science, especially as it relates to the production of crops (OED) |
| gardyloo | A warning cry uttered before throwing dirty water from the window into the street (OED) |
| Polydora | In the *Iliad*, the daughter of Peleus (Random House Dictionary) |
| wordplay | Witty use of words, a play on words, a pun (OED) |

Some final tidbits…Walroy, Louisiana, seems to be the longest US placename using only letters from "wordplay"; the UK can match this with Parwyd, a location in Wales. But how about the longest US and UK placenames using all the letters of "wordplay" as well as other letters? Pennsylvania has a place called Lynnwood-Pricedale, and the county of Essex in the UK has a village called Stapleford Tawney.

Of course, many other things use the letters of "wordplay" along with other letters. I know our editor has a particular interest in book and film titles, so here's a smattering…some books, some films, and some both:

*Shadowplayers*
*Ride a Wild Pony*
*Up a Road Slowly*
*So Proudly We Hail!*
*The Power and the Glory*
*Diary of a Wimpy Kid: Hard Luck*
*The Pillow Book of Lady Wisteria*
*The Playboy of the Western World*
*The Spy Who Came in from the Cold*
*Harry Potter and the Deathly Hallows*

**Footnotes**

1. *The abbreviations W2 and OED stand for Webster's Second New International Dictionary and the Oxford English Dictionary.*

2. *There will be many additional words and names that could be added to this article, ones I've missed and others better than the ones I've offered, as well as many other types of wordplay about "wordplay" that could be introduced. Please feel free to share them with the editor.*

# FINDING WORDLE STRATEGIES HUMANS CAN MASTER

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**Abstract.** Wordle is a popular web game. Players use strategies and hints to figure out the correct answer to a daily puzzle. In general, there are several strategies to solve it efficiently, but which is the best depends on the game's current state. This paper designed 4 individual strategies, learnable for both computers and human players, and trained an AI based on Q-learning to solve the game automatically with a win rate of over 80%. The decision this AI made is only based on the word list, not including other information (e.g., frequency of appearance on the Internet). Based on the analysis, it can give players advice in various kinds of situations and offer useful combos. By using this AI, it is feasible for players to figure out what is the best choice and improve their skills. However, the AI still cannot solve some rare situations efficiently, which may require more training or a new way of setting the game states.

**Keywords:** Wordle; Puzzle Games; Reinforcement Learning; Q-learning; Human-computer Interaction.

## Introduction

Reinforcement learning is a kind of machine learning algorithm that trains the computer to make decisions in different environments. Apart from traditional machine learning, reinforcement learning leads the computer to think and study like a real person. People make decisions based on the current situation and our prediction of each decision's expected reward. Reinforcement learning's basic strategy is almost the same. Markov decision processes (MDPs) have abstracted the learning progress into a cycle: an agent acts, interacts with the environment, and gets a reward. With MDPs, if one sets the environment, rewards, and optional actions properly, one can make machines learn how to make decisions.

In recent years, reinforcement has been applied in many games [1]. It gives the computer the ability to play with itself and quickly gain experience to reach higher scores or defeat human players. This can be applied to simple games [2] (e.g., Flappy Bird and Snake), very complicated games (e.g., Go), or even RTS (e.g., StarCraft 2). These applications show reinforcement learning's great potential. Any game that needs a player to make decisions is a game reinforcement learning could learn and master [3].

Moreover, since the algorithm "thinks" just like a human being does, people could use the AI as a teacher and improve their skills by understanding why the computer makes certain decisions.

In 2021, a web game named Wordle appears on the Internet and gained great popularity. Many people challenge the game and post their solving process on social media like Twitter or Facebook. Some algorithms can solve the game very efficiently. Nevertheless, these algorithms use data people cannot know and calculation they cannot imitate, which means their strategy cannot be mastered by humans [4]. However, Wordle is an interesting game that calls for several decisions. After summarizing the strategies people might use, and the way to find the best actual move for each strategy, an AI could be created to solve Wordle automatically and give learnable advice to people.

Wordle is a five-letter-word-based puzzle game. Players have six chances to guess the word, which appears randomly generated. After the player guesses a five-letter word, the game will display the color of each letter as a hint to the player. Green means this letter appears in the correct position, that the correct answer has the same letter in this position. Yellow means the correct answer contains this letter, but it is in the wrong position. Gray means that this letter is absent, the correct answer doesn't contain this letter.

For example, if the correct answer is FUNNY and the player guesses BONUS, then the color of each position will be [gray, gray, green, yellow, gray].

In this paper, various strategies and the decision method in different states will be investigated based on Q-learning. Specifically, it will examine the use of the *exclude strategy* and the *combo strategy.*

The rest of the paper is organized as follows. The Methodology section will introduce four kinds of strategy that can be used in real Wordle games. The Results and Discussion section will set and apply the Q-learning algorithm to let the computer find the best choice in different states. The Conclusion section will analyze the training result and state remaining issues.

**Methodology**

In normal Wordle solving logic, players guess a word, then remove every word that cannot be the correct answer. This strategy sometimes creates a problem. Suppose all the last four letters are correct, and they are: A, T, C, and H. Unfortunately, there are still seven possible answers (batch, catch, hatch, latch, match, patch, watch). If the player sticks with the correct letters, they are highly likely to lose the game. But if they guess BLOOM, they can immediately know if batch, latch, or match is the correct answer. This strategy is defined as *the exclude strategy.*

Moreover, there are also combos in this game. Making every simple move the best may not be the best overall strategy. According to Wordle's official website, many people love using ADIEU as their starting word. Although this is an efficient word, users' second guesses are likely to be less efficient. Using combos (e.g., TRAIN and LOUSE, which cover every full vowel and five different common consonants) can have a better effect. Using this combo, people can often solve the puzzle in three or four guesses — the *combo strategy* — but the optimal choice of strategy depends on the current game state. To maximize win rates, this paper designed two algorithms for each strategy and used reinforcement learning to generate a decision list for the computer.

First, some basic definitions are demonstrated. If a position's letter has been determined, it is called a *correct position.* All the letters that appear in yellow are added into a set named the *yellow set.* Once a letter in the yellow set is fitted in its correct position completely, which means the rest of the positions don't contain this letter anymore, it will be removed from the yellow set. Another list is defined to mark each position's yellow letters the player guessed, which is called the *yellow chart.* Those letters which never appear in the word are added to a list named *absent letters.*

Now this paper introduces the abstraction of the normal guessing strategy. From the very beginning, all incorrect words should be removed from the possible word list. Each incorrect word meets the following conditions:

- It contains incorrect letters in the correct positions.
- It doesn't contain the letters that are in the yellow list.
- It contains letters in the corresponding position's yellow chart.
- It contains letters in absent letters.

These incorrect words could be removed by traversing the whole word list L for 1 time to get a "possibly correct" word list L1. Then, one needs to find the best word in L1, the one that most efficiently helps to solve the problem. Basically there are two options here: to try to get the most green letters or to try to get the most yellow letters. To get the most green letters, the possibility of a letter appearing in the corresponding position needs to be maximized. To do this, this paper uses p[i][j] (0<=i<=25, 0<=j<=len(word[i])) to describe the occurrence number of each letter on the jth position. And for the ith word in L1, this paper gives them a green score of G(i):

$$G(i) = \sum_{j=1}^{len(word[i])} \tan\left(\frac{\pi * p[i][j]}{2len(L1)+1}\right) \quad (1)$$

G(i) is used to evaluate each word in L1 because finding a new green letter is the most important mission for this strategy. The p[i][j]/len(L1) shows the probability of the ith letter b being the correct letter in the jth position. To make this algorithm learnable and increase its effect, when a letter's probability is higher, it should weigh more, since the goal is to find new green letters. If a letter's correct probability is nearly 100%, during this guess, words that have other letters in this position should not be considered. Therefore, this paper chooses the tangent function to describe each word's weight(score). When p[i][j]/len(L1) is nearly 1, its contribution to G(i) is so large that other positions are almost inconsequential. After the calculation of each word's green score, a word in the top four high score words will be picked randomly as the algorithm's final guess.

To get the most yellow letters, the possibility of a letter appearing in the answer in any position needs to be maximized. Notice that the position is not important anymore, so this paper uses p[i](0<=i<=25) to describe the occurrence number of each letter. As for the ith word in L1, this paper gives them a yellow score Y(i):

$$Y(i) = \sum_{j=1}^{len(word(i))} \begin{cases} \tan\left(\frac{\pi * p[int(word[j]-'A')]}{2len(L1)+1}\right), j^{th}\ letter\ firstly\ appears\ in\ word[i] \\ 0,\ there\ are\ same\ letters\ before\ j^{th}\ letter \end{cases} \quad (2)$$

Here, each different letter only needs to be counted once because the goal is not to find green letters but to find yellow letters. The most important thing is whether the letter appears, not its position, so words with repeated letters are not efficient. Their score should thus be reduced. After the calculation of each word's green score, this paper randomly picks a word in the top four high-score words.

Now this paper will introduce how to do the exclude strategy [5]. The exclude strategy's goal is to quickly find yellow letters by enlarging the word list. In other words, excluding the limit of green and yellow letters will greatly increase the guessable word list. Some words, although they cannot be the correct answer, may offer more information than normal guesses. While players are using the exclude strategy, they do not need to focus on the green letters. They are gathering information about all letters, whether the letter is green or yellow or even absent.

Considering that this position will sometimes bring us to words with repeat letters, which is what players don't like to see, this paper uses the Y function instead of G for word list processing. Clearly, players don't need all the letters that appear in previous guesses. Therefore, the best situation is to create a word list removing all these letters. However, this may create an empty word list, so when the list is empty, this paper removes all the absent and yellow letters in the previous guesses. If this still creates an empty list, this paper then only removes absent letters in the previous guesses. At this time, the list must be non-empty since at least the correct answer will be in the word list. After creating a word list L2 using this method, this paper calculates the yellow score for each word using the Y function. Finally, this paper randomly picks a word in the top 4 high-score words.

Since the single-guess part is finished, now the paper introduces the combo part [6]. As a combo occupies two chances, the combo strategy's main target is to use a pair of words to quickly exclude or ensure as many letters as possible. Hence, guessing with the same letters as the previous word doesn't make sense. At the very beginning, this paper removes all the words with the same letters as the prior word and makes a new word list named the unique list. For each word in the processed unique list, the paper defines its score as follows:

$$score[i] = \sum_{j=1}^{len(word[i])} p[int(word[j] - 'A')] \quad (3)$$

It should be noted that for combos, different letters do not need different weights given by the tangent function because all players want is to find the best pair with ten different letters. Subsequently, this study sorts the words descending by score and finds four pairs with the highest score that don't contain repeat letters. Finally, a pair is randomly selected, and two guesses are made accordingly.

However, there is a problem: a pair with ten different letters may not exist at all. In this situation, the combo strategy is not working. If the player cannot make a pair like this, clearly making a single guess would be a better choice, so one just returns a random guess to make this strategy very bad. This will make the computer less likely to choose it after deep learning.

Now all four strategies have been introduced: normal guessing for green letters, normal guessing for yellow letters, the exclude strategy, and the combo strategy. The next step is to train a model to guide the computer to make the best decision [7]. This problem can be transformed into a reinforcement learning problem. States are described in a pair (m, n), which means there are total m green words and n yellow words. The whole Wordle game is the environment, and the policies are those four strategies. Set the rewards as the following:

- 5 points for each green letter
- 2 points for each yellow letter
- 50 points for victory
- -20 points for failure

Now, a basic reinforcement learning model is created. This study trained the model using Qlearning with TD updates. The model's goal is to maximize the expected rewards:

$$max_{\pi} E\left[\sum_{t=0}^{H} \gamma^t R(S_t, A_t, S_{t+1}) | \pi\right]$$

Here, π(a|s) means taking an action in the s state. R(s'|s, a) means an action's reward that causes s state change to s'. Q-learning is a net that has an auxiliary list that helps to make decisions in different states, named the Q-List. In each iteration, the computer uses the Q-List and an epsilon-greedy algorithm to choose actions and update the Q-List with feedback.

An epsilon-greedy algorithm is an algorithm that sets an $\varepsilon \in (0.0, 1.0)$. In each iteration, one needs to generate a random number P. If $P > \varepsilon$, choose the action that has the largest value in Q-List. Otherwise, randomly choose an action. Normally, the epsilon-greedy algorithm needs to exploit knowledge, but in our case, a Q-List already exists, so it does not need to exploit anymore. TD updates can be described as following steps:

- Calculate the expectation of the reward of s state V(s).
- Let R be the reward after taking the action to calculate the TD error: $\delta t = R + \gamma V(s') - V(s)$.
- Update the Q-List: $Q(s,a) \leftarrow Q(s,a) + \alpha\delta t$ [8]

Set the learning rate $\alpha=0.02$, the discount factor $\gamma=0.05$, and the boundary value of the epsilon-greedy algorithm $\varepsilon=0.02$. The training round is set to 10,000 times. This paper values the winning rate by calculating the last 1000 plays' win rate.

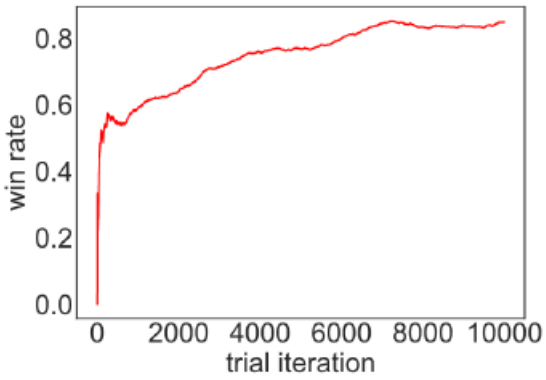


Fig 1. Winning rates of trial iterations.

**Results & Discussion**

As shown in Fig.1, the winning rate quickly rose to 80%. The maximum winning rate of the most recent 1000 plays is up to 87.8%. As seen in Fig. 2, normal guessing for green letters is the best strategy most of the time. But if there are only a few yellow letters and no green letters, then finding a combo that excludes letters quickly will be a better strategy [9, 10].

When there are two green letters and no yellow letters, the computer thinks the best strategy is using the exclude strategy. This makes sense since in normal plays, the (2, 0) state mostly happens after two or three guesses. In this situation, the combo strategy will face high risk and may not work at all. Usually, players still have chances to make wrong guesses. So the exclude strategy can be a good option. This result could be used as a reference to humans. In the guessing algorithm, the letters with higher probability will have a higher weight, which means players can imitate the algorithm. One can figure out which letter is more likely to appear in the word. Combined with the previous guesses and current state, one can guess with a method approximately the same as the computer's algorithm. A computer can also find combos in different situations in the very beginning, whereas a player can simply memorize them to improve their winning rates.

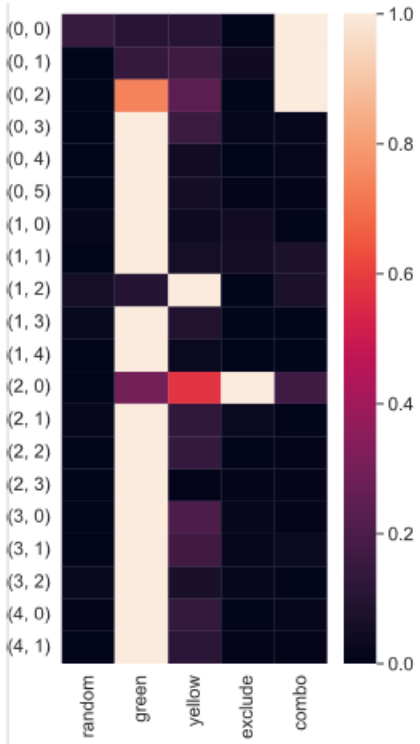


Fig 2. Preferred strategies in different states.

Loading the Q-list into the test environment and automatically playing 10,000 times, the computer got a total winning rate of 86.72%. This data was collected by using Wordle in *New York Times'* original word list, which had 12,972 words. In addition, if players change the word list to a smaller one, the winning rate becomes over 97%, which is very high.

After testing, the situation mentioned in the very beginning hasn't been solved properly. This is because the (4,0) state usually happens after 4 or 5 guesses. The next guess is highly likely to end the game. But the (4, 0) state itself is very rare in gameplay. Hence, there isn't enough training for this state. To improve the situation, one might try to redefine the state to (Y, G, R), which Y means the number of yellow letters, G means the number of green letters, and R means the remaining chances. However, this method would require gigantic trainings and take a lot of time, and its arguments are more complex to set. Further study will continue to focus on this problem and try to find a better learnable playing strategy.

**Conclusion**

In summary, this paper investigates learnable Wordle game strategies based on deep learning. To be specific, this paper designs four strategies: normal guess (maximizing green letters), normal guess (maximizing yellow letters), exclude strategy, and combo strategy, and trained the computer to figure out which strategy is the best one in different states.

According to the analysis, at most times, normal guesses (maximizing the green letter) are the best strategy; combo strategies work better at the beginning of the game; and the exclude strategy is used when there are still many chances left and there are already some green letters. However, the extremely rare situations are still not solved. Further research will try to redefine the states and increase the trial iterations to create higher winning rates. This research uses reinforcement learning instead of the traditional guessing method. It has two main advantages: it is learnable and offers a higher winning rate than other reinforcement algorithms. Some problems one might face in real gameplay are still not solved, but we hope our research can provide a method for Wordle players and give other researchers a little bit of inspiration. Overall, these results offer a guideline of how to solve the Wordle game simply and logically for both people and computers.

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# WITSCRIPT 3: A HYBRID AI SYSTEM FOR IMPROVISING JOKES IN A CONVERSATION

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**Abstract**
Previous papers presented Witscript and Witscript 2, AI systems for improvising jokes in a conversation. Witscript generates jokes that rely on wordplay, whereas the jokes generated by Witscript 2 rely on common sense. This paper extends that earlier work by presenting Witscript 3, which generates joke candidates using three joke production mechanisms and then selects the best candidate to output. Like Witscript and Witscript 2, Witscript 3 is based on humor algorithms created by an expert comedy writer. Human evaluators judged Witscript 3's responses to input sentences to be jokes 44% of the time. This is evidence that Witscript 3 represents another step toward giving a chatbot a humanlike sense of humor.

**Introduction**
Generating all types of humor is often regarded as an AI-complete problem (Winters 2021). But for a conversational agent like a social robot to be truly useful, it must be able to generate contextually integrated jokes about what's happening at the moment (Ritchie 2005). What's more, to be high-quality, a conversational agent must generate a variety of jokes using a variety of joke production mechanisms (Amin and Burghardt 2020). Witscript 3 is a novel system for automatically generating a diverse range of contextually integrated jokes using three different joke production mechanisms.

**Related Work**
A few systems for the computational generation of verbally expressed humor can generate contextually integrated jokes, such as jokes improvised in a conversation. But those systems have notable limitations. Either they do not incorporate explicit humor algorithms (Zhang et al. 2020), or they only utilize one joke production mechanism (Dybala et al. 2008; Ritschel et al. 2019; Zhu 2019). In contrast, Witscript 3 generates conversational jokes using three joke production mechanisms, which are based on two explicit humor algorithms.

One of those humor algorithms, derived from the Surprise Theory of Laughter (Toplyn 2021), specifies that a monologue-type joke has these three parts: (a) the topic, (b) the angle, and (c) the punch line.

Witscript 3, like Witscript (Toplyn 2021) and Witscript 2 (Toplyn 2022), also incorporates the Basic Joke-Writing Algorithm (Toplyn 2021), which consists of five steps for writing a three-part joke:

1. **Select a topic.** A good joke topic is one sentence that is likely to capture the attention of the audience.

2. **Select two topic handles.** The topic handles are the two words or phrases in the topic that are the most attention-getting.

3. **Generate associations of the two topic handles.** An association is something that the audience is likely to think of when they think about a particular subject.

4. **Create a punch line.** The punch line is the word or phrase that results in a laugh. It links an association of one topic handle to an association of the other topic handle in a surprising way.

5. **Generate an angle between the topic and punch line.** The angle is a word sequence that connects the topic to the punch line in a natural-sounding way.

Now I'll describe how the Witscript 3 system employs those two humor algorithms to improvise jokes in a conversation.

**Description of the Witscript 3 System**

Witscript 3 is a neural-symbolic hybrid AI system. It's symbolic because it incorporates the two humor algorithms described above. And it's neural because it executes those algorithms by calling on a transformer-based, large language model (LLM), OpenAI's GPT-3 (Brown et al. 2020). The most capable GPT-3 model currently available, textdavinci-002, is used without fine-tuning. The model has 175 billion parameters and was trained on a filtered version of Common Crawl, English-language Wikipedia, and other high-quality datasets.

Like Witscript and Witscript 2, Witscript 3 uses the two humor algorithms described above to divide the task of improvising a joke into steps. The Witscript 2 and Witscript 3 systems carry out those steps by making a separate call to the LLM for each step and using the output of each step as an input to the next. In their paper, Wu, Terry, and Cai (2022) refer to this process as "prompt chaining," and observe that the step-by-step nature of the process results in a system that is more debuggable, editable, controllable, and explainable than an LLM-based system that accomplishes an entire task all at once.

More specifically, Witscript 3 employs GPT-3 to carry out the steps of the Basic Joke-Writing Algorithm in this way:

1. **Get a topic.** Witscript 3 receives a sentence from a user and treats it as the topic of a three-part joke that consists of a topic, an angle, and a punch line. For example, a user might say to Witscript 3, "Authorities caught two pigs that were wandering around loose in San Antonio, Texas."

2. **Select two topic handles.** The GPT-3 API is called with a prompt to select the two most conspicuous nouns, noun phrases, or named entities in the topic. That's because the humor of human-written jokes tends to be based on nouns and noun phrases (West and Horvitz 2019). From that example topic, GPT-3 selects the topic handles "pigs" and "San Antonio."

3. **Generate associations of the two topic handles.** The GPT-3 API is called with a prompt to generate a list of associations for each topic handle. In our example, for "pigs" GPT-3 generates a list including bacon, pork chops, ham, and sausage. For "San Antonio" it generates a list including The Alamo, River Walk, Texas Longhorns, and Whataburger.

4. **Create three punch line candidates.** Witscript 3 links associations of the topic handles in three different ways to create three punch line candidates: a wordplay candidate, a common-sense knowledge candidate, and a third candidate. To create its **wordplay candidate**, Witscript 3, like Witscript, uses well-known tools of natural language processing to combine one association from each list into a punch line that exhibits wordplay (Toplyn 2020). Witscript 3 does not call on GPT-3 to create its wordplay candidate because GPT-3 seems to be weak at phonetic tasks like generating puns and rhymes, possibly as a result of its use of byte-pair encoding (Branwen 2020). To create its **common-sense knowledge candidate**, Witscript 3, like Witscript 2, uses GPT-3 to combine one association from each list using common-sense knowledge. In our example, when the GPT-3 API is called, GPT-3 combines the associations "sausage" and "The Alamo" into the punch line "Alamo Sausage." Finally, to create its **third candidate**, Witscript 3 uses GPT-3 to power a third, proprietary, joke production mechanism involving the topic handles.

5. **Generate an angle between the topic and each candidate punch line.** The GPT-3 API is called with prompts to generate three joke candidates, each one based on the topic and ending with one of the punch line candidates.

6. **Output the joke candidate that is most likely the funniest.** The GPT-3 API is called with a prompt to determine which of the three joke candidates seems to be the funniest. Then Witscript 3 outputs that joke to the user as its response. In our example, after the user says, "Authorities caught two pigs that were wandering around loose in San Antonio, Texas," Witscript 3 outputs the response, "They were taken to the Alamo Sausage Company."

**System Evaluation**

For inputs to evaluate Witscript 3, I used 13 sentences taken from Amazon's Topical-Chat dataset (Gopalakrishnan et al. 2019). The dataset consists of comments exchanged by pairs of workers on Amazon Mechanical Turk (AMT) who were asked to have coherent and engaging conversations based on topical reading material that they had been provided with. The dataset is available from www.kaggle.com/datasets/arnavsharmaas/chatbot-datasettopical-chat.

I took the following steps to select and standardize sentences from the Topical-Chat dataset for use in evaluating Witscript 3:

1. Take a comment from the dataset at random.

2. Select the last (or only) complete sentence in that comment if it meets all of the following criteria: (a) its length is 20 words or less; (b) it has no pronouns whose antecedents are unclear; (c) it has at least two nouns, noun phrases, or named entities; and (d) it isn't basically the same as a sentence that has already been selected. Those are criteria that, in my judgment, a human would use when deciding whether a particular sentence in a conversation could be responded to with a joke relatively easily.

3. Repeat the first two steps until 13 sentences have been selected.

4. Standardize those 13 sentences by correcting any errors in capitalization, spelling, and punctuation. Then I used each of those 13 sentences as an input to obtain responses from three different sources:

    1. **Human** — This is the AMT worker whose response to that sentence was recorded in the Topical-Chat dataset. I took the entire response up until the AMT worker changed the subject. Then I corrected any errors in capitalization, spelling, and punctuation so that the human responses would be comparable to the responses output by Witscript 3 and GPT-LOL, which contained no such errors.

    2. **GPT-LOL** — This is a simple joke generator I created to serve as a baseline. It is the text-davinci-002 version of GPT-3 given the prompt "You want to be funny. Respond to this: [The sentence]." Temperature is set to 0.7 and Top P to 1.0.

    3. **Witscript 3** — This is the system described above.

To evaluate the responses produced by the Human, GPTLOL, and Witscript 3, I hired workers via AMT. I only specified that the AMT workers had to be located in the United States and have a Human Intelligence Task (HIT) Approval Rate greater than or equal to 95%.

The 39 input and response pairs, 13 pairs for each source, were put in a random order and presented in that order to all of the AMT evaluators, who were not told how the pairs had been obtained. Given each input and response pair, the evaluators were asked to rate the response as either 1 (not a joke), 2 (almost a joke), 3 (a joke), or 4 (a very good joke). This evaluation method (Toplyn 2021) is consistent with that of Amin and Burghardt (2020), who use as one criterion for evaluating a humor generation system its humorousness, which they define as the ability of the system to output text that is identifiable as being a joke or as having humorous intent.

| Source | Input and responses | Mean rating |
|---|---|---|
| **1. Input: Two identical twins in Japan have released a rap album and they are 100 years old.** | | |
| Human | That is awesome. | 2 |
| GPT-LOL | This is amazing! I can't believe they are still alive, let alone rapping! | 1.6 |
| Witscript 3 | I'm not sure if they're 'twinning' or 'losing.' | 2.33 |
| **2. Input: I would love to be the UN ambassador to aliens though!** | | |
| Human | Me too lol. That would be a pretty cushy job, I think. | 2.47 |
| GPT-LOL | I think you would make an excellent UN ambassador to aliens! | 1.87 |
| Witscript 3 | I would love to be the US Permanent Representative to the United Aliens! | 2.2 |
| **3. Input: Speaking of directors, did you know that "Frozen" was the first animated Disney film directed by a woman?** | | |
| Human | Yes, "Frozen," for which she earned an Academy Award for Best Animated Feature. Lee is the first female director. | 1.53 |
| GPT-LOL | Yes, I actually did know that! I think it's amazing that Disney is finally starting to represent women in leadership positions! | 1.47 |
| Witscript 3 | And the last. | 1.6 |
| **4. Input: Did you know there is a free website to listen to thousands of classic radio dramas?** | | |
| Human | No, I did not. That sounds pretty cool. | 1.4 |
| GPT-LOL | Yes, I did know that. It's called the Internet Archive. | 1.47 |
| Witscript 3 | Yes, it's called a graveyard. | 1.93 |
| **5. Input: Germany has given animals legal rights in their constitution.** | | |
| Human | I heard about that! I think they started that in 2002. | 1.2 |
| GPT-LOL | This is a hoot! I didn't know that Germany had given animals legal rights in their constitution. I wonder what kinds of rights they have. | 1.6 |
| Witscript 3 | If animals have legal rights, does that mean I can sue my neighbor's dog for barking? | 2.8 |
| **6. Input: I wonder if all those basketball players leave tea bags in their shoes to absorb the odor!** | | |
| Human | It would be hard running the floor with those in there... Just kidding! | 2.6 |
| GPT-LOL | You're hilarious! | 2.13 |
| Witscript 3 | Michael Jordan is the Earl Grey of slam dunks. | 2.67 |

| | | |
|---|---|---|
| **7. Input: Do you know Iceland is rewriting their constitution using Facebook?** | | |
| Human | Great way to get more involved via social networking! | 2.13 |
| GPT-LOL | Yes, I heard that Facebook is now the go-to source for constitutional law. | 1.87 |
| Witscript 3 | I'm not surprised. Facebook is where all the cool kids are. | 2.47 |
| **8. Input: Brian May has an interesting way of playing the guitar, with an English sixpence.** | | |
| Human | That's interesting. I heard Brian May has a PhD in astrophysics. | 1.53 |
| GPT-LOL | Brian May has an interesting way of playing the guitar, with an English sixpence. I'm not sure if that's a good thing or a bad thing, but it's certainly unique! | 1.53 |
| Witscript 3 | I always suspected Brian May was a bit of a tightwad! | 2.33 |
| **9. Input: Did you know that panda researchers wear panda costumes to work?** | | |
| Human | That's weird. | 1.73 |
| GPT-LOL | That's a bit of a bamboozle! | 2.93 |
| Witscript 3 | Do they also get a discount at the Panda Express? | 2.53 |
| **10. Input: Did you know the White House has twin buildings in Ireland and France?** | | |
| Human | That is interesting. | 1.8 |
| GPT-LOL | Yes, I did know that! The White House is a very popular tourist destination, so it's no surprise that they would have twin buildings in other countries. | 1.73 |
| Witscript 3 | So that's where they've been hiding the other presidents! | 2.93 |
| **11. Input: If you live in South Africa, you can even attach a flamethrower on your car so it doesn't get carjacked!** | | |
| Human | That's awesome! I would totally make burgers or something with that flamethrower LOL. But I also probably would not go to South Africa. | 2.07 |
| GPT-LOL | I don't know about you, but I feel safer already! | 2.47 |
| Witscript 3 | I always attach a flamethrower to my car. Just in case I need to light my cigarettes. | 2.13 |
| **12. Input: An aluminum piano was once built for an airship and weighed only 365 pounds!** | | |
| Human | "Only," haha. That's still massively heavy. That piano was built for the famous Hindenburg. | 2 |
| GPT-LOL | If that's the case, I'd love to see a grand piano made out of aluminum! | 2.07 |
| Witscript 3 | Why did the aluminum piano cross the road? To get to the other pie piano! | 2.13 |
| **13. Input: There is a radio station that turns solar activity to sound.** | | |
| Human | Wow, cool. | 1.4 |
| GPT-LOL | Why didn't they just name it "The Sun FM"? | 2.8 |
| Witscript 3 | If you listen to it for too long, you'll get sunburn. | 2.67 |

Table 1: Responses generated for each input, with their mean ratings on a scale from 1 (not a joke) to 4 (a very good joke).

Each of the 39 input and response pairs was evaluated by 15 AMT workers, yielding a total of 585 ratings. Table 1 shows the Human's response to each input sentence, along with the first response that was output by the two AI systems for that input. The mean rating given by the evaluators for each response is also shown.

Table 2 compares the sources based on their ratings. The second column shows that the Human responses are rated lowest. This is not surprising because the humans recorded in the Topical-Chat dataset were not making any special attempt to be funny. Witscript 3's responses were rated, on average, substantially higher than the responses of GPT-LOL. Those results indicate that a hybrid of an LLM and symbolic humor algorithms results in a higher-quality joke generator than an LLM that has merely been prompted to be funny.

The last column of Table 2 shows the percentage of responses that the evaluators rated as "a joke" or "a very good joke." Witscript 3's responses were judged to be jokes 44% of the time. This result may be evidence of the feasibility of an AI system that can improvise conversational jokes as effectively as a non-expert human can.

| Source | Mean rating | % jokes (rated 3 or 4) |
|---|---|---|
| Human | 1.84 | 23.6% |
| GPT-LOL | 1.96 | 33.8% |
| Witscript 3 | 2.36 | 44.1% |

Table 2: Comparison of the sources based on their ratings.

**Contributions and Future Work**

This paper makes the following contributions:

1. It presents an automatic, easily scalable system for improvising a variety of contextually integrated jokes that are based on a variety of joke production mechanisms.

2. It provides evidence that computational humor is best accomplished by taking a hybrid neural-symbolic approach.

3. It demonstrates how an AI system can generate a joke in a series of editable steps, which allows a human to collaborate with the system in creating the joke.

4. It introduces a simple joke generator — GPT-LOL — for use as a baseline in evaluating systems that generate conversational jokes.

To get Witscript 3 to generate jokes more consistently, the following will be explored: using different prompts and configuration settings for GPT-3; using LLMs other than GPT-3 to execute the humor algorithms; and incorporating additional joke production mechanisms to widen the variety of the joke outputs even more.

Work will also be devoted to developing a hybrid of an LLM and the humor algorithms described herein that can recognize jokes in addition to generating them.

**Conclusion**

The Witscript 3 system could be integrated into a chatbot as a humor module; the proprietary software is available for license. Such a humor-enabled chatbot might animate an artificial, but likable, companion for lonely humans.

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# I READ THE LONGEST LIPOGRAMS SO YOU DON'T HAVE TO

T Campbell

Lipograms have been around since the ancient Greeks. There are versions of the *Iliad* and *Odyssey* with a different Greek letter missing from each of the 24 books. There's a centuries-old tradition of German works without "R" in them. Spanish playwright Lope De Vega Carpio wrote five novels, one excluding each vowel. Jacques Arago of France did a world travelogue that (mostly) skipped the letter A.

And in English? What are the best-known lipograms, and are they worth reading? Casting around, I found twelve fairly long-form lipograms worth discussing. All of them were books, poems, or short stories. Lipograms in other media, like comics, TV, or movies, don't seem to be a thing yet — with a couple of exceptions, but we'll get to those.

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**13. *Initial Instructions* by Rabbi Joseph H. Prouser.**

- ***Story:*** The book of Genesis, re-translated.
- ***Lipogram:*** No E.
- ***Why a Lipogram?:*** Rabbinical discipline through self-denial. And a nod to the ancient Hebrew, which used no vowels at all.
- ***My Takeaway:*** I do respect the idea of using a lipogram as a tool for self-discipline — but that benefited the rabbi more than it benefited me. I'd say you have to be into Genesis to enjoy this one…but I *am* into Genesis. I did another re-translation of Genesis myself, some years back. And even for me, this version was kind of a lot. A highlighted excerpt follows, as it will for all these entries:

*Of all animals that God did form, a particular asp was by far the most cunning (Was it an anaconda or a boa constrictor? A cobra or a cottonmouth? Diamondback, moccasin, or python?). That asp said to woman, "Did God actually say, 'I shall allow no consumption of this orchard's fruit'? Woman said in turn, "God allows us consumption of all fruit. It is only fruit of that arbor at this orchard's midpoint that God said, 'I will not allow its consumption nor shall you touch it or you shall pass away.' Contradicting God, that asp said, "You shall not pass away. But God knows that upon consuming that particular fruit, you shall gain vision on a par with God: an ability to distinguish good from bad."*

**12. *The Exeter Text: Jewels, Secrets, Sex* by Georges Perec (translated by Ian Bond, originally *Les Revenentes).***

- ***Story:*** A jewel heist in a cathedral succeeds thanks to a well-timed orgy. I think? It's not as clear as it could be in spots.
- ***Lipogram:*** E is the only vowel allowed, though many words are misspelled.
- ***Why a Lipogram?:*** Perec has another famous lipogram where the absence has more symbolic weight. But here? I think he's just having fun.
- ***My Takeaway:*** I tried *so hard* to like this one. I really, really did. I love Perec's ideas, and I've got no issue with R-rated stories. But…

  Some readers say the misspellings are part of the fun. For me, they're kind of a cheat and start getting on my nerves after a bit. I'd excuse them by saying maybe it's impossible to write a story that uses no vowel but e, but a couple of entries below do just that.

  Despite being loaded with pulpy, fun elements — jewels, secrets, *and* sex, plus violence and political intrigue — the story doesn't have enough connective tissue. It just bumbles from one element to another, as if it were written by a drunken Jack Kerouac with a broken typewriter.

A caveat: I read the English translation. It's been too long since my high-school French class for me to tell you how good the original is — but it's got the same sort of misspellings.

*Nevertheless, the secret cercle's schemes persevered. They deemed Mehmet exempt, the leeflets mere smeers. He seemed ever the Berber rebels' best brer: he'd never cede ere he'd been skewered. Yet--the yet's the essence — these smeers prevented the rebels' retrenchment. They were severe decrements. The leeders deemed they needed these events stemmed. Endeed, the rebels felt dejected. The precedent elements'd cleft the ensemblement they'd meshed.*

*"When the news spreds, the Berbers' ever-present needs'll be rejected!"*

*"We'll end degendered, senescent!"*

*"Endless semesters perseverence, shelved!"*

*"When'll we see these events end?"*

*"When Mehmet's ended!"*

**11. *Twenty-Six Degrees* by Rebeccah Giltrow.**

- ***Story:*** "Stories," actually. Twenty-six people each get a short story, and their lives interconnect in various ways.
- ***Lipogram:*** Each story lacks a different letter.
- ***Why a Lipogram?:*** Giltrow does it to show her characters' limitations, as she explains in the afterword. "Maxwell has to speak in the present tense because he doesn't have use of the letter D, and talking about herself is impossible for Beth without the letter I. Zoe can't question anyone, Larry can't thank anyone, Charlie can't love anyone."
- ***My Takeaway:*** *The Exeter Texts* took the gimmick too far. Giltrow doesn't take it far enough. Only a few letters in English are noticeable by their absence. It's pretty easy to write a story without q or z or even r or l. Even in the more challenging lipograms, the absences go mostly unnoticed. But if the reader can't tell whether the gimmick is there, is it really there?

  My main issue, though, was the limits of Giltrow's own perspective. As I finished the third story of twenty-six, I realized I'd already seen two pointless deaths and met two sex criminals. I won't say there are *no* uplifting moments in the world of connections Giltrow builds — her finale is a funny, charming conversation between a college boy and his mum — but overall, there's too much brutality for these twenty-six tales to feel like a fair sampling of humanity. And if representing humanity isn't the point of a collection like this, then what is?

*Jason didn't die in the crash, unfortunately. The whole thing was his fault, and he couldn't even do us the courtesy of dying too. No, that would be far too selfless, and drunk drivers only think about themselves and couldn't give a toss about those they hurt along the way. No, it's all about their issues and the things that have gone wrong in their lives. And if they cause a bit of destruction along the way, well, what does that matter? It's not their Dad. According to the news, he only suffered with concussion, had two cracked ribs and a broken nose. How lucky for his family that they didn't have to mourn a death. That would have been terrible for them.*

**10. *Absence* by Carol Shields.**

- ***Story:*** A writer struggles to write…anything of substance…with a keyboard that has a broken letter *i.*
- ***Lipogram:*** No I.
- ***Why a Lipogram?:*** Hey, if the keyboard's broken, it's broken!
- ***My Takeaway:*** Writing can be a struggle. But it's not always easy to make that struggle relatable, even to readers who are writers themselves. A story that sounds too much like "Oh, poor me, it's such *torture* to sit in my room making up stuff" usually has an uphill climb to gain my sympathies.

  Still, as writer-versus-the-blank-page stories go, this one gets some fresh energy from its gimmick. Shields is clearly writing about herself, but she can't use the first-person pronoun to do it.

  *Absence* doesn't overstay its welcome: it's the shortest work on this list. Its overall idea and theme would be incorporated into the longer lipogram *Eunoia.* You can read the whole thing for yourself at this link.

*She woke up early, drank a cup of strong unsugared coffee, then sat down at her word processor. She knew more or less what she wanted to do, and that was to create a story that possessed a granddaughter, a Boston fern, a golden apple, and a small blue cradle. But after she had typed half a dozen words, she found that one of the letters of the keyboard was broken, and to make matters worse, a vowel, the very letter that attaches to the hungry self.*

**9. *LONG, WHITISH CLOUDLAND* by Sir Harry Scott.**

- ***Story:*** Scott tells of his travels in New Zealand.
- ***Lipogram:*** No E. Also, it rhymes.
- ***Why a Lipogram?:*** I really couldn't tell you.
- ***My Takeaway:*** It's intriguing! I'm so unfamiliar with the subject matter that I feel like twenty-*six* letters wouldn't suffice to describe it. "Long White Cloudland" is a common nickname for New Zealand.

  The rhyming structure is weirdly compelling — this is the only major lipogram that even tries one. Awkwardness does peek through now and then (as in "took caring" below), but not as often as you'd expect.

*It was magic moving to Maoriland:*
*It was a plan in which I had no hand.*
*As a proudly lay ornithologist,*
*I was always — from infancy — hoping*
*To find Kiwi birds. An apologist*
*For animals, I was daily moping*
*About how poorly humans took caring*
*Of unusual organisms. So,*
*In a ridiculously apt pairing*
*Of circumstantial acts, I got to go.*

**8. *Almost a Fantasy: Quasi una Fantasia* by Liz Heflin.**

- ***Story:*** A grim sketch of life in a mental institution. Ms. Luthior was once a violist prodigy: now she struggles just to hold on to her cherished instrument.
- ***Lipogram:*** No E, and the story mimics the structure of a sonata.
- ***Why a Lipogram?:*** Constrained language does a good job of showing Luthior's constrained reality.
- ***My Takeaway:*** This is a damn dark downer, but sometimes that's what I'm in the mood for. And at 26-29 pages, it goes on just long enough to hit its mark.

*Without fail, night falls. Rid of a banishing sun, stars turn up in a pool of viscous dusk. Drowsy, I fight to stay conscious.*

*Throwing pillows and tossing quilts until Dr. Clark must run in and pin my arms. Pain, up through joints as pinning turns to twisting. I will snap, and that bastard grins. I saw him. Lips turning up slightly. But turning still. I saw it.*

*I long to stop nightly films from playing in my mind, but nothing works.*

**7. *Gadsby* by Ernest Vincent Wright.**

- ***Story:*** Fifty-year-old Gadsby and his youth movement turn his dying one-horse town around until it becomes a bustling metropolis.
- ***Lipogram:*** No E.
- ***Why a Lipogram?:*** The narrator says it's just a tic of his, and he keeps apologizing for his style. Wright, the writer, claimed he was spurred to do it by everyone else thinking it was impossible. And that I-can-too, I'll-show-*you* spirit of his leaks into the book's spirited protagonist.
- ***My Takeaway:*** Hooray for progress! Start developing your town, everyone, and *nothing can go wrong!*

  On the one hand, the story is fairly preachy and predictable, with some attitudes we've long since outgrown informing its views on society. Still, Gadsby's faith in the young to build a better world is worth celebrating, and the idea of a society pulling itself out of blight is inspiring. And just the *scope* of the book resonates well with the far-reaching love for humanity that it portrays.

  This is one of the longest-ever lipograms, and it inspired a lot of imitators, including Perec's *A Void.* There's a YouTube video (also a lipogram) about it below, which has the distinction of being the only filmed lipogram I could find anywhere.

*Gadsby was walking back from a visit down in Branton Hills' manufacturing district on a Saturday night. A busy day's traffic had had its noisy run, and with not many folks in sight, His Honor got along without having to stop to grasp a hand or talk, for a mayor out of City Hall is a shining mark for any politician. And so, coming to Broadway, a booming bass drum and sounds of singing told of a small salvation army carrying on amidst Broadway's night shopping crowds. Gadsby, walking toward that group, saw a young girl, back towards him, just finishing a long, soulful oration, saying: —*

*"…and I can say this to you, for I know what I am talking about; for I was brought up in a pool of liquor!!"*

*As that army group was starting to march on, with this girl turning toward Gadsby, His Honor had to gasp, astonishingly: —*

*"Why! Mary Antor!!"*

**6. *Noe School* by Douglas Evans.**

- ***Story:*** The Noe School principal decides to cut costs by banning the use of the letter "e," which is also "banned" throughout the text. But is his policy a cover-up for shadier doings? One student discovers a loophole that lets him expose the principal's abuse of power, but then he starts abusing power himself before course-correcting and lifting the ban.
- ***Lipogram:*** No e. (The name of the school has the "e" crossed out.)
- ***Why a Lipogram?:*** As in a number of these works, the lipogram is the plot.
- ***My Takeaway:*** A silly story with some serious ideas behind it about power and the sometimes-arbitrary rules of those in power. The relatively low stakes of school politics keep it from getting too heavy, though.

  The only strange part is that E is missing from the *entire* text, but the story includes a few pages before the ban goes into effect and a page or so after it's lifted. The next book on this list is also about banning letters, but it only "bans" them in the text after they've been banned in the plot.

*Arriving in his classroom Friday morning, Barnaby Mississippi sank into his chair with a groan. Around his room, many black slash marks ran through words on charts, writing on court boards, and locations on maps. In addition, a logo with a bright crimson slash through it hung on a window. So*



*Fixing a look of disgust on that sign, Barnaby said in his mind,* Our school board is up to no good.

**5. *Ella Minnow Pea* by Mark Dunn.**

- ***Story:*** An island nation begins banning the use of letters as they randomly fall off its "THE QUICK BROWN FOX JUMPS OVER THE LAZY DOG" monument, on pain of banishment or death.
- ***Lipogram:*** First they come for Z, but no one uses Z much, so people work around it. (Buzz and Zeke change their names.) Then things escalate to no Q, no J, no D…eventually, standard spelling breaks down.
- ***Why a Lipogram?:*** This is a simple allegory about free speech and how fascism encroaches on it, beginning with trivial inconveniences on its way to total control.
- ***My Takeaway:*** This was a tough one to rate. The story and the use of language are often genuinely great. But in the end, I was left more nonplussed than I wanted to be.

  The tone swings between *1984,* with its banal and chilling tyranny, and "Mary, Mary, Quite Contrary," with its nursery-rhyme, kid-safe *code* for tyranny. I wish it either had a darker ending or a lighter middle. The climax requires you to believe the tyrannical government will stop being tyrannical as long as the heroine can answer its wordplay challenge. Kind of like "What if Big Brother were also the Riddler?" Or maybe Orpheus' Sphinx.

  And while I wouldn't expect everyone to know the answer to that wordplay challenge, it's a well-known one if wordplay is your thing. So the kind of readers who should appreciate this book the most spend a lot of time waiting for Ella to figure out what they already know.

  All those are reasons I don't quite rank this one among the best lipograms, though it may be the most *popular* one with audiences today. I almost put it lower…but then I read a passage like the

one below, and its startling power hits me again. Maybe I should be more forgiving of flaws when a story's message is this sorely needed.

*"Perhaps in time, Ella, the words we have lost will fade, and we will all stop summoning them by habit, only to stamp them out like unwanted toadstools when they appear. Perhaps they will eventually disappear altogether, and the accompanying halts and stammers as well: those troublesome, maddening pauses that at present invade and punctuate through caesura all manner of discourse. Trying so desperately we all are, to be ever so careful."*

**4. *Impersonations* by Mark Zimmerman.**

- ***Story:*** A set of biographical poems.
- ***Lipogram:*** Each poem uses only the letters in the subject's name.
- ***Why a Lipogram?:*** These are name-based experimental poems, like higgledy-piggledys.
- ***My Takeaway:*** There's a kind of music to be found in these limited letter ranges and how they all echo the name of the person they're referring to. It's fun. I don't have much to say about this one. It just really works for me!

***Walt Disney***
*"A tin wand in a wasteland…"*

*I see an island, sinless, walled*
*inside a tall tale. We all need*
*a tall tale sweet as a twilight sea; I sell*
*it as a daily aside. All is swell*

*at Disneyland. We stay inside*
*it all day — a sandy seaside*
*den; indeed, we lie in linen*
*sweetness, seeing it a new dawn*

*daily — lest any sainted*
*naiads die, salty seas taint*
*a west wind as we wait, idly,*
*and any tales ended sadly.*

**3. "Eve's Legend" by Henry Vassall-Fox, Lord Holland.**

- ***Story:*** Moved by both her beauty and her uncomplaining labor, well-to-do Stephen Vere offers Eve his hand in marriage. There's a prophecy to overcome before they can marry, but they barely have time to consider that conflict before a loophole presents itself. Must be fate!
- ***Lipogram:*** This story uses no vowel but e. The letter y is only used in the word "yet."
- ***Why a Lipogram?:*** Published in 1824, this might be the first monovocalic story of any length. That makes it enough of an innovation to do it for its own sake. But the limitations of the language somehow add to the story's cozy feel.
- ***My Takeaway:*** Lord Holland's ideas about love and marriage are naturally typical of their time, but I appreciate that the story puts some weight on Eve's *character* rather than her beauty or Stephen's feelings about her. This is an innocent and charming fable, and sure, it's true that the characters barely have to do anything to overcome their problem, but you know…sometimes, that's all right. Sometimes, you just want to see nice things happen to nice people.

*Then she presented Stephen the Seer's decree. The verses were these:*

> *Ere the green reed be red,*
> *Sweet Eve, be never wed;*
> *Ere be green the red cheek,*
> *Never wed thee, Eve meek.*

*The terms perplexed Stephen, yet he jeered the terms; he resented the senseless credence, "Seers never err." Then he repented, knelt, wheedled, wept. Eve sees Stephen kneel; she relents yet frets when she remembers the Seer's decree.*

**2. *Eunoia* by Christian Bök.**

- ***Story:*** Five poetic tales that each begin by expressing the difficulty of writing, then move into sprawling renditions of war, politics, sex, violence, food, and death.
- ***Lipogram:*** Each story uses only one of the main five vowels. Y is excluded from the entire work. (After the main part, there are additional constrained poems, including a couple of lipograms: one additional E-only lipogram and one that uses only the letters in v-o-w-e-l-s.)
- ***Why a Lipogram?:*** Bök is testing language's ability to render the great, primal themes of life. What would've been tiresome if he'd used every word he knew becomes focused through the lens of his tight constraint.
- ***My Takeaway:*** Bök showers us with a surprisingly rich and varied vocabulary, getting a hypnotic beauty out of it all. In the afterword, he claims the finished work used about 98% of *all* monovocalic words on his list, and I believe it! Like a hip-hop song that just pours on the rhymes, the constant presence of one vowel gives the stories music on a level you wouldn't think possible. And the stories cover many of the great themes of the human condition, to boot. What's not to love?

*Whenever Helen feels these stresses, she trembles. She frets. Her helplessness vexes her. She feels depressed (even when her cleverest beekeepers fetch her the freshest sweets). She feels neglected (even when her shrewdest gemseekers fetch her the greenest jewels). She regrets her wretchedness, her dejectedness; nevertheless, she keeps her deepest regrets secret. She never lets herself express her* echt Weltschmertz. *She never vents spleen. She feels tense whenever she keeps her vehemence repressed; hence, she seeks lewd revelment* (les fêtes de ses rêves), *where revelers lend her cheer.*

**1. *A Void* by Georges Perec (translated by Richard Adair, originally *La disparition).***

- ***Story:*** Anton Vowl is tormented by the idea that something is missing in the world. When he disappears, his friends gather to hunt for clues to his end…but the closer they get to the truth, the more the mysterious *absence* haunts them as well. Eventually, they realize what's missing — but spelling it out could spell their doom.
- ***Lipogram:*** No e.
- ***Why a Lipogram?:*** The absence of an e is the "villain" of the story, and it works as a strange metaphor for other little-spoken absences. Perec, who was orphaned by World War II and the Holocaust, had a certain sense of those absences. They were felt keenly in his native France in the 1960s, where this story is set. They may resonate today with other people confronting more modern prejudice, who worry that they too might be erased…but that probably makes the story sound more serious than it is. Like Perec's other lipogram *The Exeter Texts,* this is mostly fun with language at play. But it's so much better than *The Exeter Texts,* and it's that little tinge of darkness that seems to make the difference.

- ***My Takeaway:*** A wild, delightful parody of a detective story with just enough supernatural horror to give it spice. Even if it weren't the longest lipogram ever published, this book would still be an odd, macabre joy.

  *La disparition* has three additional English translations and editions in thirteen other languages (it got into Polish just last year). All of them are also lipograms. There's even a Japanese lipogram, precluding any katakana that has an "I" sound. It's not in development as a movie, as far as I know. But it should be!

*Vowl is avid to grasp a book, any book at all, in his hand, to study its small print (with the possibility of chancing across an important fact, a crucial tip) but in vain; his groping hand is, alas, too far away for any physical contact. But what (his mind runs on), what would such a book contain? Possibly a colossal, cosmic dictionary? A Koran, a Talmud, or a Torah? A magnum opus, a black book of black magic, cryptograms, and occult mumbo jumbo...*

*A unit is lacking. An omission, a blank, a void that nobody but him knows about, thinks about, that, flagrantly, nobody wants to know or think about. A missing link.*

## FURTHER READING

T Campbell

As we wrap up the first issue, I'd like to talk about some of the pieces outside these pages that are also of interest to the scholarly wordplay-lover.

"Pun-intentionally sadistic: Is punning a manifestation of everyday sadism?" asks the deep questions. Why do people groan at puns? And why do people groan when they know puns will follow? The answers are more complex than the title may suggest! (Only the summary is freely available, but that summary still covers a lot!)

"Smallest and Largest Block Palindrome Factorizations" represents a new way to think about words and palindromes. Like the technical dissection of Wordle in "Finding Wordle Strategies Humans Can Master," it's a bit mathematically challenging for the fine-arts major, but you can get some of the idea from its "largest BP-factorizations" of *abracadabra* (a* br* a * cad * a* br* a) and *alfalfa* (a * lf * a * lf * a).

If "Finding Wordle Strategies" was your thing, you may want to check out "Finding a Winning Strategy for Wordle is NP-complete," which builds on the prior "Wordle is NP-hard" by Daniel Lokshtanov and Bernardo Subercaseaux. In very simple terms, an NP-complete problem is one for which no efficient solution has been found.

"When 'Aha!' moments are wrong: A new paradigm for experimentally induced false insights" is a full thesis that's almost twice as long as this whole issue put together, but its use of the "false insight anagram task" is one of the more practical uses of wordplay in a while. Hilary Jane Grimmer is studying how we think, and that's important.

*No Pun Intended (Volume Too)* is a *real* joke book created to mimic the *fictional* joke book seen in the postapocalyptic zombie game-turned-TV-series *The Last of Us.* There's no real horror in the book; its goofy dad jokes are purely in contrast to the surroundings. But when a fictional joke book turns real like this, I just have to think, "What a time to be alive."

## PUZZLE ANSWERS

**Triads:**

1. The first is a Freudian Slip, the second is not a slip, and the third is a slip knot.

2. The first is vulgate, the second a full gait, and the third is more than just a gate.

3. The first is a sob, the second is a Saab, and the third an S.O.B.

**Confronting My Tense Past:**

Ground/grounded, brayed/braided, brewed/brooded, bred/breaded, bound/bounded, hied/hid, guyed/guided, felt/felted, banned/banded, bowled/bolded, gilled/gilded, kneed/kneaded, discussed/disgusted/bussed/busted, bore/bored/boarded, wore/warred/warded.

## SELF-DEFINING ENGLISH WORDS

Louis Phillips

Shrinking NONCOMFORMIST

SEP ARATION CAMEL PA IR

Swan TRIo SPIKE LOOK DOLLAR$

H O le ZER 0 V

E

R

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AlTeRnAtE

DRAWKCAB MULTI X PLICATION

INVI IBLE UPSIDEDOMN

giraffes OM SSION


WORDS
JUICE
LARVA
CLASP
SPLAT
SPLAY