The functional view of intuitive etymological explanations

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Abstract

People routinely make up stories to explain why things are called what they are called. These ***intuitive etymological explanations*** (IEEs) show up in children and adults, and even become cultural narratives shared across generations. Yet, they're typically wrong. As a result, scholars have historically ignored them or treated them as mere curiosities that are irrelevant to our linguistic competence and even interfere with our theories of language evolution. Contrary to this view, we propose that IEEs may be a functional activity that people engage in to learn and maintain a massive, ever-changing lexicon. In Experiment 1, we find preliminary evidence that IEEs, whether self-generated or culturally-transmitted, can support word learning in comparison to control conditions in which participants engage with contextual word use (both self-generated and culturally-transmitted). In Experiment 2, we find that, despite being incorrect, culturally-transmitted IEEs can support word learning more than true etymologies. Across two preregistered experiments, our results suggest that intuitive etymological explanations, though typically incorrect, may facilitate language use by building structures of form and meaning out of our linguistic experience.

Keywords: etymology; intuitive theory; word learning; inference

Introduction

People are naturally curious about why things are called what they're called: Why is it *quick sand* rather than *fast sand*? Why is a bad dream called a *nightmare*? What do *goosebumps* have to do with geese? *Deadlines*? In fact, we are not merely curious–we actively invent plausible explanations for words. For example, people often assume that *bankrupt* must originate from *bank* and *rupture*, though its true root is more likely *banca rotta* meaning "broken bench" (Quinion, 2006). This propensity to generate our own explanations for words even appears in early childhood: *coffee* is so named because it makes you cough, a piece of corn is called an *ear* because it can be held up next to our own (Clark, 1993; Jackendoff & Audring, 2019). This phenomenon has been documented across cultures and throughout time (Bell & Ukai, 1931; Chakravarti, 1933; Chukovskiĭ, 1963; Yāska, & Sarup, 2015). Because they are typically incorrect, such explanations have been dismissed and even seen as detrimental to learning the true structure of the lexicon (Durkin, 2013; Liberman, 2009; *inter alia*). We will refer to this as the **classical view**.

In contrast, the goal of the present paper is to propose a **functional view** on this behavior. Despite being incorrect in important ways, we will argue that it is an effective cognitive strategy that people use to organize a structure for understanding and therefore remembering their lexicon. In the present paper, we provide some of the first empirical support showing that these phenomena, which we call **intuitive etymological explanations** (IEEs), are a strategy which supports language learning (Experiment 1), and that their inaccuracy helps us to learn language better than true, underlying historical accounts of words can (Experiment 2).

The classical view Throughout time, IEEs have been described as implausible, ignorant, and even linguistic "perversion" (Palmer, 1882). Speculation about the origins of words dates back to at least the 7th century BCE, when philosophers claimed that Sanskrit nouns came from just a small set of verbs (Yāska, & Sarup, 1921; Chakravarti, 1933). Later, English-language lexicographers would make surprising claims about words: Walter Whiter (1822) claimed that because the earth existed before all other possible referents, every word must be traceable to earth-related forms such as "mud". Many IEEs have been so popular that they have altered language itself–chaise *longue* (meaning long) became chaise *lounge*, presumably to reflect the function of the referent (Algeo, 2010). What these and thousands of other IEEs have in common in that they have arisen solely from speculation rather than diachronic evidence, and are overwhelmingly wrong. Thus, their prevalence has been a significant obstacle to progress in language research by etymologists, who have been forced to dedicate much of their work to weeding out baseless and outright false claims (Liberman & Mitchell, 2008; Durkin, 2009). While this pattern of developing inaccurate word origin stories has been well documented under the classical view, from a behavioral perspective it is not yet understood why people have engaged in this practice for so long.

The functional view We propose that IEEs address a central challenge that learners face throughout life: the size and growth of lexicons. Most English speakers know upwards of 50,000 words and may encounter as many as half a million (Kipfer & Steinmetz, 2013), with multiples more if they are multilingual. Despite the complexity and size of our vocabulary, the average language user recalls old and low-frequency words, re-interprets those which have shifted meaning, and learns entirely new words with little or no explicit instruction. Adding to this challenge is the so-called *arbitrariness of the sign*, a principle in linguistics that explicitly states that there is little predictable relationship between form and meaning (Saussere, 1916). We suggest that the challenges language users deal with, such as vocabulary size, wordform and meaning complexity, and rapid rate of lexical change and growth, reflect a need for which IEEs offer a solution.

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The key idea of our proposal is that IEEs are produced via an intuitive theory of language creation and change. Intuitive theories in psychology refer to mental causal models which operate over concepts to structure our knowledge, make predictions, serve as the basis for explaining the data we experience in the world, and have been documented by psychologists in other domains, such as physics, psychology, and statistics (Gopnik & Wellman, 1994; Gerstenberg & Tenenbaum, 2017; Jara-Ettinger, Gweon, Shulz & Tenenbaum, 2016; Liu, Brooks & Spelke, 2019; Shtulman, 2017; Thomas et al., 2022). In this case, an intuitive theory of language creation and change does not represent the lexicon as a static collection of words in a vacuum where meanings are named with arbitrary sounds. Instead, referents are named via a causal process in which language users draw on their available vocabulary and world knowledge to modify and create and new words. For instance, a child's IEE that *coffee* is so named because it makes us cough may reflect a reasoner's implicit causal chain in which coffee was discovered at a point where *coughing* was already a named activity, and that a salient effect of this new beverage was that it generated this effect. By relating wordforms to simpler ones based on their sound and meaning, we propose that language users construct a meaningful causal explanation for how a word came to be, which contrasts with what might otherwise be an entirely arbitrary and unmemorable set of facts. While the specifics of the mental models making up the intuitive theory is beyond the scope of the present paper, here we investigate whether IEEs can be understood as facilitating language learning.

While a functional view on IEEs may make sense to some, precious little work outside of the classical view has documented them, let alone accounted for their purpose or explained how they work. Language research in the cognitive tradition has focused on ground-truth questions about the lexicon, such as whether languages show some internal correlations between phonology and semantics (Dautriche et al, 2017; Dingemanse et al., 2015; Gutierrez, Levy & Bergen, 2016). Some research has found that learners can be led astray by the meanings of words' near phonological neighbors (Haslett & Cai, 2022), but rule out the possibility that users are consciously aware of this process (Haslett & Cai, 2023). Some early work has prompted children to engage with words this way, finding seemingly limited explanations such as, "it's called a blackboard because it is a black board," (Berko, 1958). Other, more promising studies from second language research taught figurative idiomatic expressions to adults and found that associating phrases with more literal "source" meanings benefits learning (Boers, 2001), and that instruction on true etymologies (vs. solely on definitions) did as well (Hussein & Faris, 2014).

Building on these results, in Experiment 1, we test how IEEs affect word learning when they are self-generated or culturally-transmitted. Importantly, we designed matched control conditions: participants self-generate example sentences using the word and learn culturally-transmitted example word uses. In Experiment 2, we test for the *intuitive* component by comparing learning words via culturally-transmitted IEEs vs. learning via evidence-based, expert etymologies ("true etymologies"). Based on our proposal that intuitive reasoning about word origins structures and supports language knowledge, we predicted that word learning in both IEE conditions would be higher than the control conditions.

Experiment 1

Our first experiment investigated whether participants' word learning was positively affected by engagement with IEE. Our design was a 2 by 2 in which we tested the effects of (1) IEE vs. word usage in context and; (2) self-generation vs. cultural transmission. In Experiment 1a, we prompted participants to generate their own IEEs for unfamiliar words (**self-generated intuitive etymology condition**). In the control condition, participants were prompted to generate their own example uses of the word (**self-generated use condition)**. In Experiment 1b, participants learned documented intuitive etymologies (**culturally-transmitted intuitive etymology condition**). In the control condition, the participants learned documented example usages containing the word (**culturally-transmitted use condition).** We predicted better performance in the two IEE conditions, supporting a functional view in which an intuitive theory of word creation and change enables us to reason causally about language and provides a principled way to structure and therefore remember our linguistic experience.

Methods

Participants Sixty monolingual adult English speakers from the US and UK were recruited on Prolific and compensated $8 for a 40-minute task. Preregistered sample sizes were based on project budget constraints. Thirty of the participants were randomly assigned to the self-generated IEE vs. self-generated usage experiment (Ex. 1a) and the other thirty participants were randomly assigned to the documented IEE vs. documented usage experiment (Ex. 1b).

Stimuli We tested participants' word learning with a set of 30 target words, and gathered a dictionary definition, documented IEE (for Ex. 1b) and documented example usage (for Ex. 1b) for each. We sourced the culturally-transmitted IEEs for Experiment 1b from a dictionary of IEEs which people have claimed about English words (Room, 1986) and the culturally-transmitted example usages from a dictionary of quotations (OED, 2023) and edited both to ensure they were well matched on length, semantics, and were clear and succinct. For example, for the word barracking, which means, "loud vocal criticism," the example IEE given was, "Soldiers might talk this way in their barracks (military housing)," and the example use given was, "Loud barracking from the crowd distracted at a critical moment,". To select the words, we chose thirty words pseudo-randomly from the IEE dictionary, with approximately one target word per letter of the alphabet, and alternated our search starting at the front or back of each letter's dictionary section, choosing the first (or last) word

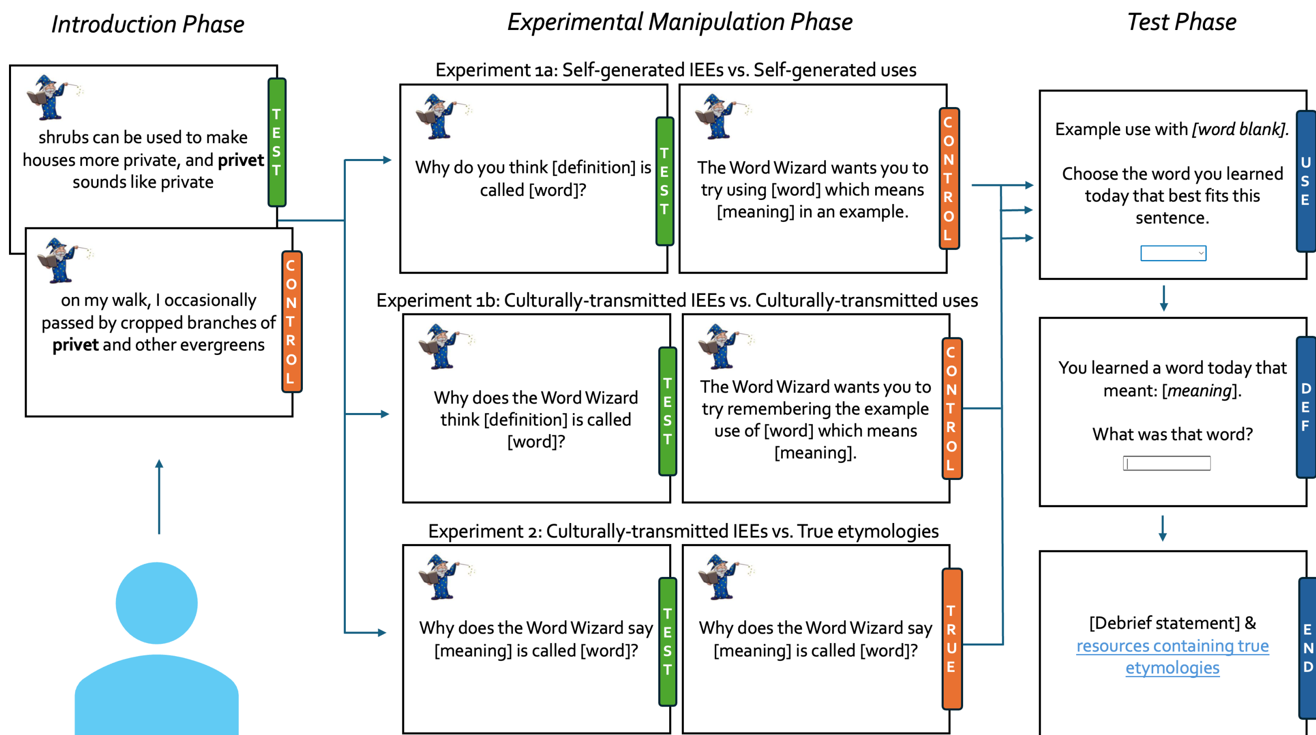

Figure 1: Schematic representation of all experiments with sequence and prompts. Trial and conditions shown here in fixed order, but condition orders were counterbalanced. Half of participants in Experiment 1 were randomly assigned to 1a and the other to 1b (n=60), and a later group were assigned to Experiment 2 (n=60).

that we judged to be uncommon in written and spoken 21st-century English, in order to test word learning in our participants. However, we selected for culturally-transmitted IEEs which did not use inappropriate or obsolete language by today's standards, and meaningfully differed from the true etymologies. Example uses were filtered in the same way, and for each word, we identified the use which was most similar to the intuitive etymology in content and lightly edited it to match the word length of the IEEs within 1-2 words, and ensured that the use examples and the intuitive etymologies had the same number of words in common with the word definitions, if any. Stimuli were presented within a condition block (IEE or usage), and participants saw both conditions within a given Experiment. Block order and stimuli-to-condition assignment was counterbalanced across participants and item order was randomized within block.

Procedure The entire experiment was administered via Qualtrics and presented through a cover story, in which participants were told that in this task, an imaginary "Word Wizard" character oversaw all English words and that they would work as his apprentice in the task.

In the *Introduction Phase,* the Word Wizard presented participants with an example word and meaning such as *privet* and shared an example intuitive etymology for the word in the test conditions, or an example usage for the word in the control conditions (see Figure 1). Participants then completed a similar training trial for another word, *brunch*.

In the *Experimental Manipulation Phase*, participants were first shown one word at a time, asked if they were familiar with it, shown the meaning, and asked if this was what they thought the word meant, each on separate pages. In Experiment 1a, in the test condition they were prompted to engage with the word and meaning by producing an intuitive etymology (see Figure 1). In the control condition, participants were prompted to generate an original example usage for the target word. In Experiment 1b, in the test condition participants were shown an intuitive etymology. In the control condition, they were shown an example use. All responses for all experiments were recorded verbally via an audio recording application embedded in the page (phonic.ai).

In the *Test Phase,* participants were tested on their memory for the words and definitions in two ways. First, in a use task, participants were shown example uses in which the target word was blank (these example uses were also culturally-transmitted and edited to match semantic overlap with all previously exposed language across condition). Below the sentence, they chose a word from a drop-down menu of all possible target words. In a definition task, participants were shown a re-phrased definition for a target word and asked to enter the target word they thought matched it in a free-response text box. For each of the two test tasks, all 30 words were tested. Presentation order was randomized for all definitions, sentences, and words. Participants were debriefed at the end (see Figure 1).

Results and Discussion As preregistered (Ex. 1a, Ex. 1b), we used a two-sided t-test to determine if participants' average accuracy was significantly higher in the test conditions vs. the

control conditions separately in each experiment and each task. In Experiment 1a, we found that participants in the use task scored higher in the test condition ($M = 0.49$, $SD = 0.20$) than in the control condition ($M = 0.46$, $SD = 0.22$), but this difference did not rise to the level of significance ($t(29) = 0.87$, $p > 0.05$). However, participants in the definition task

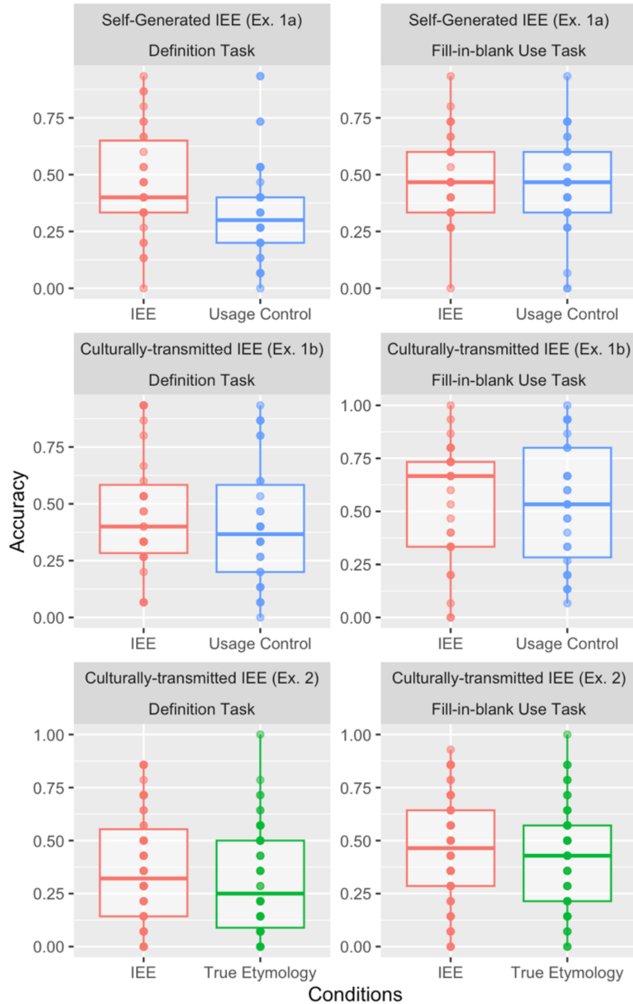

Figure 2: Performance in the intuitive etymological conditions is pink, usage conditions in blue, and true etymologies in green. Each dot represents a participant's average performance in that condition.

scored higher in the test condition ($M = 0.46$, $SD = 0.24$) than in the control condition ($M = 0.32$, $SD = 0.21$), and this was significant ($t(29) = 3.64$, $p < 0.01$), as predicted.

In Experiment 1b, participants in the use task scored only slightly higher ($M = 0.55$, $SD = 0.28$) than in the control condition ($M = 0.54$, $SD = 0.30$), and this difference did not rise to the level of significance ($t(29) = .26$, $p > 0.05$). However, as predicted, participants in the definition task scored higher in the test condition ($M = 0.47$, $SD = 0.27$) than in the control condition ($M = 0.41$, $SD = 0.28$), and this difference was marginally significant ($t(29) = 2.04$, $p = 0.05$).

The condition differences can be seen in Figure 2, and when visualized via summary statistics, appear modest. However, as preregistered, we intended to account for subject and item effects, and to avoid the likely under-powered conditions of the separate t-tests. Therefore, we pooled all the data across the two Experiments (1a and 1b) as well as across both tasks (usage and definition), fitting a multilevel model including random intercepts for participant, item, and Experiment (1a vs. 1b), and random slopes for participant and item, and found that participant performance in IEE conditions was significantly higher ($\beta = 0.07$, $t(38) = 3.3$, $p < 0.01$).

Though differences between test and control conditions were not always significant when analyzed separately, mean performance in the test conditions on each comparison was numerically higher than performance in the control conditions (see Figure 2), and rose to significance or marginal significance in three of five planned analyses, including an analysis of the full data set using multilevel modeling, where we found a significant effect of the IEE conditions even after accounting for effects of subject, word, and Experiment type. At the same time, it is perhaps of note that the effect of IEE engagement was non-significant specifically in the fill-in-the-blank use tasks. This is perhaps predictable as the use task was highly similar to the control tasks which asked participants to generate their own use of the word (Ex. 1a) or to read and recall a use of the word (Ex. 1b). It is possible that the lack of significant effects observed in the use controls was due to the control tasks' high similarity to the use outcome measure, which inflated findings in the control condition.

We made no prediction about differences between the effects of self-generated and culturally-transmitted etymological engagement. However, based on the *generation effect* (Jacoby, 1978; Slamecka & Graf, 1978), it would be reasonable to expect better learning in self-generated conditions. To test this possibility, we conducted an exploratory analysis, again entering our data across the two experiments into a multilevel model, including random intercepts for participant, item, and condition, and random slopes for participant and item, and found that participant performance in the self-generation studies was actually slightly lower ($\beta = -0.06$, $t(61) = -1.01$, $p = 0.32$), though this effect was not significant.

We also considered possible limitations to our study. In the *Introduction Phase*, while we provided participants with experience with an IEE, we also provided the same participants in that phase with experience with an example use of the word, in a counterbalanced order. Importantly, however, other low-level details did differ across test and control condition: for example, in Experiment 1a (see Figure 1), because the mode of engagement differed conditions (explain vs. generate a usage), prompt wording was difficult to match. Therefore, in Experiment 2, we designed a study in which all text and prompts surrounding the etymologies could be identical (see Figure 1). However, our main motivation for running Ex. 2 was theoretical: while we had interpreted effects from Ex. 1 as evidence that intuitive etymologies aid in language learning more than example

usages do, it was equally possible to conclude that etymological reasoning of any kind aids in language learning- not *intuitive* etymological reasoning in particular. Therefore, we next contrasted IEEs with true etymologies, which also allowed us to explicitly match prompts and wording across conditions.

Experiment 2

As in Ex. 1, we predicted that IEEs would confer benefits on word learning. This time, we compared the same culturally transmitted IEEs from Experiment 1b to true etymologies.

Method

Participants Another 60 monolingual adult English speakers (no overlap with Ex. 1 participant pool) from the US and UK were recruited on Prolific and compensated \$8 for a 40 minute task.

Stimuli Our target words and design remained the same as Ex. 1, save for 2 words which were removed, as their IEEs could not be matched to their true etymologies (see details on matching below). We used the same culturally-transmitted IEEs from Ex. 1b. We additionally found true etymologies for each target word (OED, 2024; Merriam-Webster, 2024). To ensure that the two conditions were well matched on low-level characteristics, we chose the true etymology in which the usage of the target word was most similar to its culturally-transmitted IEE. We made minor edits to IEEs and true etymologies to match their length within 1-2 words, and to match the lexical overlap with the definitions across conditions. We chose not to block item presentation by condition as in Ex. 1, but allowed trials to be fully randomized, therefore interleaving conditions.

Procedure All 60 participants saw both experimental conditions. The *Introduction Phase* was almost entirely identical to Experiment 1, except for the usage prompt which was removed because this was no longer the comparison task. In the *Experimental Manipulation Phase*, participants were tested for their knowledge of the words, shown an IEE or true etymology, and recalled it. The *Test Phase* was identical to the first experiment, and was again followed by debrief.

Results and Discussion We again used the same two outcome variables as in Experiment 1. As preregistered, we used a paired, two-sided t-test to determine if participants' average accuracy was higher in predicted condition (culturally-transmitted IEE) vs. the comparison condition (true etymology). We excluded one participant on the grounds that, as preregistered, they scored below 4% in both conditions (chance in the use task). In the use task, we found that participants in the IEE condition scored higher ($M = 0.47$, $SD = 0.25$) than in the true etymology condition ($M = 0.44$, $SD = 0.24$), but this difference did not rise to the level of significance ($t(56) = 1.5$, $p = 0.13$). In the definition task we found that participants did score higher in the IEE condition ($M = 0.38$, $SD = 0.25$) than in the true etymology condition ($M = 0.32$, $SD = 0.24$), and this difference was significant ($t(56) = 2.7$, $p < 0.05$). Additionally, when we pooled all the data across the outcome tasks in a multilevel model including random intercepts for participant, item, and outcome task type, and random slopes for participant, participant performance in the intuitive etymology conditions was significantly higher than in control conditions ($\beta = 0.04$, $t(59)= 2.5$, $p < 0.05$).

Our explanation for the discrepancy between the definition and use tests in Experiment 1 was that the control conditions were closer to the use task since they either involved generating or recalling a use of the word, leading to an inflated performance in the use task. Interestingly, however, this fails to explain this observed effect in Experiment 2, as the comparison condition required participants to recall a true etymology, rather than an example use sentence. We consider this further in General Discussion.

General Discussion

The present paper takes a first step in providing evidence for a functional view on intuitive etymological explanations (IEEs), in which commonsense, non-expert reasoning about word origins provides people with a beneficial structure for learning and using language. This functional view stands in stark contrast with classical perspectives on etymology, which focus on their inaccuracy. We argue that this deviation from expert, evidence-based etymologies is precisely what gives IEEs their functional value: they reflect laypeople's commonsense meaning-making, serving to organize word knowledge and provide an accessible structure for word memory. In two Experiments, we show that generating and learning IEEs better supports memory for words over generating and learning contextualized usages of the words and over evidence-based etymologies for the words.

However, an unanticipated feature of our results was a persistent difference between our two learning measures: the effect of IEEs was significant when asked to produce a word given a definition, but not when asked to recognize a word given an example usage. In Experiment 1, we speculated that this was because of the use tasks' conceptual similarity to our control conditions. However, we found the same difference in Experiment 2 which used true etymologies as the comparison condition rather than usages.

A possible explanation for the discrepancies between use and definition outcome measures is that IEEs may invite generics about the referent's category membership or general behavior, better equipping them for reasoning through an abstract definition, in contrast with the control usages or true etymologies, which may highlight context-specific details of word meaning. For example, for the word *weever* ("a kind of fish with sharp, poisonous spines"), we gave the IEE, "they would weave their way close to shore, waiting there for prey," highlighting a predator who performs an action seemingly relevant to its name (swimming/weaving). In contrast, the true etymology, "in Old French, *wivre* referred to a serpent or dragon," evokes some similar concepts of predation, but does not link to abstract categories

(waterborne) or behaviors (swimming/weaving). Similarly, the control usage, "delivering painful stings, weevers can be found off the coasts of Western Europe," shares a specific piece of information and highlights water by mentioning *coast*, but does not reinforce behaviors in the way that the IEE did. However, many different features of IEEs may work together to produce better word learning, especially in the case of definition learning, and future work will need to explore which of these features are most important in producing the effect. Some prior work has examined the logic of words which have been altered via IEEs, referred to as *folk etymology* (Rundblad & Kronenfeld, 2000), and the Cognitive Semantics approach has long argued for a perspective on word meanings which explains their cognitive construction through conceptual and embodied experience (Lakoff, 2006; Langacker, 2002; Talmy, 2000), which may point to possible features which make for effective IEEs. Therefore, the next steps in this work will be: (1) to replicate our effects in larger sample sizes, and (2) to analyze the content of participants' IEEs. Namely, we intend to focus next on determining what common structures IEEs share, if any, and what might make them more or less effective in supporting word learning.

In sum, much as our intuitive psychology uses teleological reasoning to explain others' behavior in terms of goals, we suggest IEEs use a similar model: learners believe the words around them must have come to have their form and meaning for good reason, and that the causal principles underlying these reasons can be explained. As they encounter word forms, they make inferences about how those words have come to be, situating them in relation to others based on a variety of possible principles or causal laws. For example, in order to infer relationships between forms which make sense and are recoverable, learners may engage in pseudo-historical reasoning about the inferred age of a referent, construct a narrative under which a new communicative need might arise for a word, or guess the primitiveness or primacy of a meaning to infer whether it is an origin for another word. Future work will need to be done to identify these causal principles.

Together, the functional view presented here argues that learners engage in processes of rationalizing language in ways which may help them to meaningfully organize the linguistic data they encounter in the world. The evidence we present suggests that explanations using such a structure supports memory for words.

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References

Algeo, J. (2010). *The Origins and Development of the English Language* (6th ed.). Boston, MA: Wadsworth.

Bell, E. S. & Ukai, E. (1931). *Eminent authors of Contemporary Japan: One - act plays and short stories*. Kaitakusha.

Berko, J. (1958) The Child's Learning of English Morphology, *WORD*, 14:2-3, 150-177.

Boers, F. (2001). Measuring the impact of cross-cultural differences on learners' comprehension of imageable idioms. *ELT Journal*, 55(3), 255–262.

Chakravarti, P. C. (1933). *The linguistic speculations of the Hindus.* Sanskrit Pustak Bhandar.

Chukovskiĭ, K. (1963). *From two to five.* California U.P.; Cambridge U.P.

Clark, E. V. (1993). *The Lexicon in Acquisition*. United Kingdom: Cambridge University Press.

Dautriche, I., Mahowald, K., Gibson, E., Christophe, A., & Piantadosi, S. T. (2017). Words cluster phonetically beyond phonotactic regularities. *Cognition*, 163, 128–145.

Dingemanse, M., Blasi, D. E., Lupyan, G., Christiansen, M. H., & Monaghan, P. (2015). Arbitrariness, iconicity, and systematicity in language. *Trends in Cognitive Sciences*, 19(10), 603–615.

Durkin, P. (2013). *The Oxford Guide to Etymology*. Oxford University Press.

Gerstenberg, T., & Tenenbaum, J. B. (2017). Intuitive theories. In M. R. Waldmann (Ed.), *The Oxford handbook of causal reasoning* (pp. 515–547). Oxford University Press.

Gopnik, A., & Wellman, H. M. (1994). The theory theory. In L. A. Hirschfeld & S. A. Gelman (Eds.), *Mapping the mind: Domain specificity in cognition and culture* (pp. 257–293). Cambridge University Press.

Gutierrez, E. D., Levy, R., & Bergen, B. (2016). Finding non-arbitrary form-meaning systematicity using string-metric learning for kernel regression. *Proceedings of the 54th Annual Meeting of the Association for Computational Linguistics* (Volume 1: Long Papers), 2379–2388.

Haslett, D. A., & Cai, Z. G. (2022). New neighbours make bad fences: Form-based semantic shifts in word learning. *Psychonomic Bulletin & Review*, 29(3), 1017–1025

Haslett, D. A., & Cai, Z. G. (2023). Similar-sounding words flesh out fuzzy meanings. *Journal of Experimental Psychology: Genera*l, 152(8), 2359–2368.

Hussein, N. & Faris, M.S. (2014). The role of semantics and etymology in promoting insightful learning. *Journal of the College of Basic Education, 20*(85), 831–847.

Jackendoff, R & Audring, J. (2019). *The Texture of the Lexicon*. Oxford, 2019.

Jackendoff, R. (1999). *Semantics and cognition*. The MIT Press.

Jacoby, L. L. (1978). On interpreting the effects of repetition: Solving a problem versus remembering a solution. *Journal of Verbal Learning & Verbal Behavior,17*, 649–667.

Jara-Ettinger, J., Gweon, H., Schulz, L. E., & Tenenbaum, J. B. (2016). The naïve utility calculus: Computational principles underlying commonsense psychology. *Trends in cognitive sciences, 20*(8), 589-604.

Kipfer, B. A., & Steinmetz, S. (2013). *The life of language: The fascinating ways words are born, live & die.* Random House Reference.

Langacker, R. W. (2002). *Concept, image, and symbol.* Walter de Gruyter Inc.

off, G. (2006). *Conceptual metaphor*. Cognitive linguistics: Basic readings, 34, 185-238.

Liberman, A. (2009). *Word origins - and how we know them: Etymology for everyone*. Oxford University Press.

Liberman, A., & Mitchell, J. L. (2008). *An Analytic Dictionary of English Etymology: An Introduction* (NED-New edition). University of Minnesota Press.

Liu, S., Brooks, N. B., & Spelke, E. S. (2019). Origins of the concepts cause, cost, and goal in prereaching infants. Proceedings of the National Academy of Sciences, 116(36), 17747-17752.

Oxford English Dictionary. 3rd ed., Oxford: Oxford University Press, 2023.

Palmer, A. S. (1882). *Folk-etymology, a dictionary of verbal corruptions or words perverted ...*

Quinion, M. (2006). *Port out, Starboard Home: And other language myths*. Penguin Books.

Room, A. (1988). *A dictionary of true etymologies*. Routledge.

Rundblad, G., & Kronenfeld, D. B. (2000). Folk-etymology. *Current Issues in Linguistic Theory*, 19–34.

Saussure, F de. (1916): *Course in General Linguistics (trans. Wade Baskin).* London: Fontana/Collins [1974]

Shtulman, A. (2017). Scienceblind: *Why our intuitive theories about the world are so often wrong.* Hachette UK.

Slamecka, N. J., & Graf, P. (1978). The generation effect: Delineation of a phenomenon. *Journal of Experimental Psychology: Human Learning & Memory,4*, 592–604.

Talmy, L. (2000). *Toward a cognitive semantics*. Vol. 1. Cambridge, Mass.

Thomas, A. J., Mitchell, V., Sumner, E., Terrizzi, B. F., Piff, P. K., & Sarnecka, B. W. (2022). Intuitive sociology: Children recognize decision-making structures and prefer groups with less-concentrated power. Open Mind, 6, 25-40.

Whiter, W. (1822). *Etymologicon Universale; or, Universal Etymological Dictionary.* 3 vols. Cambridge: At the University Press for Richard Priestley.

Yāska, & Sarup, L. (1921). *The Nighantu and the Nirukta, the oldest Indian treatise on etymology, philology, ...* University of the Panjab.