The English Phrase-as-Lemma construction:
When a phrase masquerades as a word, people play along[1]

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This paper examines the English Phrase as Lemma (PAL) construction, which treats phrases syntactically *as if* they were words (e.g., *a don't-mess-with-me driver).* We argue that it is important to acknowledge and represent the construction's unique syntax directly rather than trying to shoehorn it into a more familiar grammatical category such as Noun or Adjective. PALs do not share the same distribution as other categories, and critically, their unique syntax influences their interpretation in predictable ways, which we demonstrate with survey data (N=600). In particular, PALs convey the type of meaning associated with individual English words—LEMMAs—and thus evoke semantic frames that are presumed shared common knowledge. We further predict that the shared common knowledge and the use of quotes encourages PALs to be interpreted as witty and sarcastic. We show that a full analysis of PALs requires a family of constructions that includes certain conventional instances and productive subtypes. Because the construction's special form and function are intimately related, we predict comparable PAL constructions should appear in other, unrelated languages. While the PAL construction is not terribly frequent in any language, the implications we draw are quite broad: our knowledge of language is rich and complex, providing subtle means for language users to indicate familiarity with listeners while conveying their messages.

1. Phrases as Lemmas

When linguists find examples that appear to run counter to general patterns in a language, we often seek explanations that essentially claim the recalcitrant examples only seem to be unusual. The allure of trying to assimilate unusual examples to more familiar or better understood patterns stems from a natural assumption that fewer patterns imply less for theorists to explain and less for learners to learn. However, what if language users display an implicit awareness that an unusual pattern is, in fact, just as unusual as it seems? The current paper identifies such a case, based on the examples like those in (1)-(10) (from the COCA corpus [Davies 2008]). In these cases, a unit with the internal structure of a phrase—even an entire sentence—appears in a slot typically reserved for a word.

(1) a trickle-down policy
(2) a must-do task
(3) the "both sides do it" argument
(4) an "I'm not a witch" moment
(5) the "How does it feel?" game
(6) a "you both win!" moment
(7) a "take music for granted" attitude
(8) the "stop making more games" argument
(9) his "At some point, we've all parked in the wrong garage" speech
(10) the "punishment is good for everyone else, but not my little angel" attitude

Terminology

Before providing an outline and key points of the paper, we briefly clarify our terminology. Examples such as (1)-(10) are often described as "phrasal compounds" (e.g., Bagasheva 2017; Göksel 2015; Hein 2017; Lieber 1988; Meibauer 2007; Müller 2018; Pafel 2015; 2017; Trips 2012; Trips and Kornfilt 2015; Trips and Kornfilt 2017; Wiese 1996) because the phrase typically modifies a head Noun in a way that is reminiscent of English compounds. However, for reasons that will become clear, we dub the construction under investigation the PHRASE AS LEMMA (PAL) construction.

We use WORD[2] to refer to a zero-level category and WORD ROOT to refer to a word without inflection. We use the term LEMMA as psycholinguists do, to refer the meanings or conceptual structures of word roots without reference to their form (Handke 2012, 5:69; Ferreira and Engelhardt 2006:63). By PHRASE we intend a multi-word unit, which may be a quote. In order to delimit the scope of our investigation, we focus here on phrases that include a finite verb and at least one other word. At the same time, as clarified in the Limitations section, the

analysis should be extendable to other types of phrases used as words (see e.g., Gehrke 2015 on German complex prenominal participial modifiers).

Since there are no stable cross-linguistic tests for grammatical categories (e.g., Croft 2001: 29-34ff), we follow the typologists' convention of capitalizing grammatical categories of a particular language. Therefore, unless otherwise specified, we use Noun, for instance, to refer to what might otherwise be described a word that passes standard tests for nouns in English, i.e., English Nouns.

2. Outline of key points

Our primary point is that it is important to acknowledge that the PAL construction is exactly as odd as it seems: a PAL is a phrase that behaves *as if* it were a word. PALs are neither Nouns, Adjectives, nor typical phrases or quotes (section 3). By recognizing a special category that has the internal syntax of a phrase but the external syntax of a word, we will be able to explain, rather than stipulate, why PALs have the special rhetorical properties we demonstrate that they have. In particular, we will argue that PALs are assigned an interpretation as if they named lemmas, as words do. Lemmas in turn label familiar, culturally relevant types of entities or events, so using a PAL is an invitation to treat a phrase as if it depicted a familiar and culturally relevant type of entity or event (section 4).

Section 4 is the heart of the current paper. Here we explain the function of the construction in detail and confirm that speakers who produce a PAL construction are perceived to share more common knowledge with their intended audience than speakers who produce a close paraphrase without a PAL (Study 1, section 4). At the same time, since the type of situation or event depicted by the PAL is described by a phrase and has *not* actually been named by a dedicated word, the situation is unlikely to actually be regularly discussed. We will explain that the depiction of situations that are familiar but not often discussed is the definition of what comedians refer to as OBSERVATIONAL HUMOR. We will further observe that PALs are commonly quotes, and quotes need not be used literally (Clark and Gerrig 1990:764; see also Pascual et al. 2012). Instead, quotes offer an opportunity to caricature the speaker (*They said "blah, blah, blah*"; *She's like "woe is me."*), which allows them to be interpreted sarcastically. Studies 2 and 3 (section 4) confirm that sentences containing PALs are judged more witty and more sarcastic than close paraphrases that do not contain PALs. Thus, we argue that naive English speakers recognize that PALs are phrases that are treated as if they were words and are sensitive to the ensuing implications: In comparison to close paraphrases, PALs imply more common knowledge between speaker and listener and are judged more witty and more sarcastic. It is incumbent on us as linguists to recognize the construction's unusual form directly, because by doing so, the rhetorical implications we document can be recognized as motivated rather than arbitrary.

While the PAL construction is highly productive, conventionalized instances and several narrowly defined productive *subtypes* of the PAL construction exist as well. A fourth study (section 4) finds that the same rhetorical factors (familiarity, wittiness, sarcasm) hold even for conventional frequent PAL tokens (e.g., *do it yourself*, *all-you-can-eat*) in comparison to close

paraphrases. A fifth study confirms that speakers recognize the conventional productive subtypes as well. These facts indicate that our knowledge of PALs requires a rich network of general patterns, instances, and subregularities, in a way that has become familiar from analyses of other constructions (Diessel 2020; Goldberg and Herbst 2021; Goldberg and Michaelis 2017; Goldberg and Jackendoff 2004; Lyngfelt 2018; Van de Velde 2014).

By directly relating the construction's unusual syntax and corresponding rhetorical functions, we predict that at least some unrelated languages should have a comparable construction, and in section 6 we cite work on comparable constructions in other West Germanic languages including German, Dutch, and Afrikaans (Hein 2017; Meibauer 2007; Trips 2012), as well as in Turkish (Trips & Kornfilt 2015). We also observe constructions in Hebrew and Brazilian Portuguese, which appear to have a comparable function in these languages. To the extent that these cases share the function of the English PAL construction, they lend support to our claim that the form and function of the PAL construction are motivated by the observation that the construction treats a clause *as if it* were a word, which in turn implies the phrase should have a lemma-like interpretation.

Before delving into the rhetorical function of the English PAL construction, we first review its formal properties in section 3.

3. PALs: Internal syntax of a phrase and external syntax of a word

A new type of category is required to capture the unusual formal properties of the English PAL construction. Rather than attempting to shoehorn PALs into some familiar category, we argue on the basis of their distribution (this section) and interpretation (in section 4), that a new category is needed.

PALs have the internal syntax of phrases

To make the point that PALs have the internal syntax of phrases, we note that they can in fact be full sentences. As illustrated in (11a-c), they can include direct address forms (e.g., *hey*) or markers of illocutionary force (e.g*., please, why am I*), hallmarks typical of full sentences rather than words (Green 1976; Hooper and Thompson 1973).

(11)a. Request: *that's pretty much the please-don't-dump-me dance, isn't it?* COCA
b. Direct address: *[This is] no stately, hey-everybody-look-at-me procession.* COCA
c. Wh- question with subject-auxiliary inversion: *the why-am-I-me question* COCA

While PAL tokens have the internal syntax of phrases, they have the external distribution of words, as has been widely observed (Bruening 2018; Harley 2011; Pafel 2015; Wiese 1996). To confirm this, first note that PAL tokens appear in positions that are unusual for clauses in English, let alone full sentences. Typically, when a Noun is modified by a Clause, the Clause follows, rather than precedes, the Noun (e.g., 12a). Noun Complements also follow their head Noun (e.g., 12b).

(12) a. English Relative Clause: …a kitten that was alive COCA
b. English Noun Complement: the report that there is arsenic in rice COCA
c. English Adjectival modifier: … the feisty kitten COCA
d. English Noun modifier: … the weather report COCA

While cross-linguistically it is not unusual for clausal *and* lexical modifiers to appear in the same position (e.g., Gil 2013), it *is* unusual in English.

PALs have the distribution of words, but resist classification as any familiar category
English PALs have most often been discussed as "phrasal compounds": modifiers in Noun compounds where they have the distribution of zero level prenominal modifiers (Bruening 2018; Harley 2011; Pafel 2015; Wiese 1996). Motivation for a compound analysis can be drawn from the stress pattern of PAL + Noun combinations. Just as compound nouns commonly favor stress on the modifier rather than the head noun (Ladd, 1984; Lees 1960:120; but see Arndt-Lappe & Plag 2007), it is the PAL that is typically stressed rather than the head Noun (see Table 1).

Table 1. Stress pattern typical of compounds (Left) and regular prenominal modification (Right)

Compound stress	**Regular modification stress**
(stress on modifier)	(stress on head N)
the FIRE truck	the red TRUCK
an "I'm not a WITCH" moment	a non-witchy MOMent
a "please don't DUMP me" dance	a last DANCE

Moreover, the PAL and Noun form a tight semantic unit, as adjectives resist intervening between PAL and N (e.g., *an angry "don't mess with me driver"* vs. ? *a "don't mess with me" angry driver*). While PALs behave like modifiers in compounds in terms of their prosody, modification function, and prenominal position, in other ways, they behave unlike modifiers in compounds. For instance, *very* and *more,* which generally modify Adjectives rather than (compound) Nouns (Wasow 1977), modify PALs in the attested examples (13a) and (13b), respectively.

(13) a. "You repeatedly dismiss inconvenient evidence … in a very 'I'm white and right, so your evidence can't be true if it disproves what I say' way" COCA
b. "He has done a much more 'I'm compassionate too' campaign to try to move up his personal ratings" COCA

Also, unlike compounds, PAL + Noun cannot be used as a modifier that scopes over a distinct head noun (14a), although this is possible for NN and AN compounds (14b-c).

(14) a. ? [[PAL N] N] : ?[["I can do it myself" attitude] game]
b. [[N^0 N^0] N^0] : [[Saturday morning] presentation]
c. [[A^0 N^0] N^0] : [[blue sky] thinking]

We capture these observations by treating PALs as a zero-level category and modifying the PAL + Noun construction as an $N^{/}$ rather than an N^0. That is, we distinguish the external syntax of NN compounds (15) and PAL prenominal modifiers as in (16).

(15) $[_{\mathbf{N0}}\, N^0\ N^0]$
(16) $[_{N'}\, PAL^0\ \ N]$

Note that we leave the head N underspecified as to its bar level (16). This is because PALs may modify Nouns with complements, particularly when the head noun identifies a type as in e.g., *a "don't mess with me" [type of driver].*

Beyond their most common use as prenominal modifiers, PALs occasionally are used as head Nouns, predicate Adjectives or Verbs, as the attested examples in Table 2 illustrate (e.g., Günther, Kotowski, and Plag 2020). We return to several of these cases in section 5.

Table 2: PAL-tokens as head Noun, Adjective, Adverb, Verb

head Noun	• Could've tried a simple "I'm sorry." COCA • my dad pulled the old "I'm going to the store for smokes, be back in five" COCA • This show is a must see. COCA
predicative Adj.	• Romney's slogan should be more 'I'm nothing like you.' COCA
Verb	• [he was] carrying on like a television husband, honey-I'm-home-ing her from the doorway. Brit Bennett, T*he Vanishing Half* • A: you're welcome. B: No, don't "you're welcome" me. COCA

Since PALs have the external distribution of words, they occasionally appear with added inflection: e.g., plural *(-s)*, when used in a slot usually reserved for Nouns, or progressive (*-ing*), when used in a slot normally reserved for Verbs (see Table 3 and Verb examples Table 3). Thus, PALs do not conform to any familiar grammatical category.

Table 3: Examples with lexical morphology applying to PALs as head Nouns or Verbs (in bold)

Attested PALs	**Morphology**
"his speech abounded in I told you so**'s**" Jespersen 1924: 96	plural suffix

Their parents were do-it-yourself**ers**. ABC News	agentive *-er* morphology + plural suffix
few people want to be memorialized "um"-**ing**, "you know"-**ing**, and "remember that time when we got drunk"-**ing** their way into ignomy. NYTimes 6/19/15	verbal gerund morphology

To summarize, we have argued on the basis of distributional evidence that PALs should be recognized for what they are: phrases that are treated as if they were words. The following section strengthens our argument for recognizing this special grammatical category by demonstrating that the unique function of the PAL construction is inextricably linked to its being treated *as if it were* a word. In particular, we predict that the construction's unique syntactic properties should imbue it with particular rhetorical functions, confirmed by empirical crowdsourced studies.

4. The function of the English PAL construction

With rare exceptions, previous accounts of PALs have focused on their syntactic properties, without much attention to their function. One exception is Trips and Kornfilt (2015, following Trips 2012), who observed that PALs used as modifiers in English either characterize a generic type of entity named by the head Noun or serve to identify a specific head Noun referent. However, these observations hold of modifiers generally (e.g., Langacker 2008: 321-323; see also Gehrke 2015, Maienborn 2009 for German prenominal participial modifiers). For instance, the parallel functions of Adjective modifiers are illustrated in Table 4. That is, this observation does not capture what is special about the function of PALs.

Table 4: General functions of both adjectival and PAL modifiers (examples from COCA)

PAL modifiers		***Adjective modifiers***	
Characterization of generic type of entity	**Identification of specific referent**	**Characterization of generic type**	**Identification of specific referent**
You don't get to do the "we never have fun anymore" thing.	*MLK's "I have a dream" speech*	A cold drink would be a good thing.	The blue team lost the challenge.
It can be characterized as a "here is the structure, you	the "I like turtles" kid		The British team restarted the race.

figure out how to
use it" approach

A second investigation into the function of PALs comes from Meibauer (2007), who documents a comparable construction in German (e.g., 17a) and provides empirical evidence that instances are judged more witty than paraphrases involving relative clauses (e.g., 17b).

German (Germanic; Meibauer 2007: 250, orthographically presented; our glosses)

(17) a. *Kaufe-Ihr-Auto-Kärtchen*
buy.PRS.1SG-2PL.POSS-car-card.DIM
'I-buy-your-car card'
b. *Kärtchen mit der Aufschrift ,,Kaufe Ihr Auto"*
card.DIM with DEF writing buy.PRS.1SG 2PL.POSS car
"Card with the writing 'I buy your car' "

Meibauer's observation that German PALs are more witty than paraphrases is insightful, and the evidence provided is compelling; we will demonstrate that the English examples are also judged more witty than paraphrases (section 4.4). However, the explanation we offer differs. Meibauer (2007: 248) writes, "Expressivity of phrasal compounds stem from a conflict between a principle that requires enrichment of a minimal and underdetermined structure in nominal compounds … and a principle that requires maximal informativity … and leads to the integration of a phrase into word structure." We interpret this to mean that by opting to use a PAL token rather than a NN compound, the speaker chooses to provide, in a concise way, a more specific description than is possible with a typical NN compound. The wittiness of the PAL construction is then said to follow from a tension between the pragmatic principles of Informativeness and Quantity.

However, note that close paraphrases of PALs exist that are minimally different in length and convey no less propositional content than PALs (compare 18a-b).

(18) a. We're at the stage of nationwide collapse where people move to Jersey.
b. We're at the "people are moving to Jersey" stage of nationwide collapse.

Insofar as Informativity and Quantity principles are satisfied equally well by (18a) and (18b), these principles do not explain why PALs are judged more witty than their paraphrases. In section 4.1, we argue instead that the fact that PALs are phrases which have the distribution of words provides the key clue as to why they serve the function they do.

A final proposal comes from an anonymous reviewer who suggests that the PAL construction be assigned an informal register, and that the differences in interpretation follow from informality. Yet the PAL construction is not informal in being easy to process or restricted to

casual contexts. PALs can create unusually long dependency lengths (between the start of the PAL and its head), and dependency length is recognized to increase working memory demands (Futrell, Levy, and Gibson 2020; Hawkins 2003). Moreover, our stimuli are primarily based on written text. Critically, rather than *assigning* increased informality to the construction, our analysis *predicts* the more specific rhetorical aspects of the PAL construction. Section 4.1 explains our proposal and empirical evidence is offered in section 4.3.

4.1. Implications of the lemma-like interpretation

As noted at the outset, we use the term LEMMA to refer to the conceptual meaning associated with an open-class word form (Ferreira and Engelhardt 2006:63; Handke 2012:69). Relational lemmas (e.g., "walk" or "speak") do not refer to specific situations that exist in time and space, but rather to SITUATION TYPES (Barwise and Perry 1983) or EVENT-KINDS (Gehrke 2015). Critically, for our purposes, in order for a lemma to be used it must be culturally relevant or "name-worthy" (Mithun 1984; see also Denlinger 2023; Gehrke 2015; Pascual, Królak, and Janssen 2013), at least to the subgroup of speakers who use it. As Fillmore (1985) put it, "meanings are relativized to frames," where a FRAME is defined as an abstraction of a familiar (recurrent, coherent) experience or situation (Fillmore 1977; 1975; Goldberg 1998, 2010; 2016; Lakoff 1987; Petruck 1996). That is, lemmas evoke stable semantic frames, and speakers who evoke a lemma presume that speakers are already generally familiar with that semantic frame. We claim, therefore, that by producing a PAL-token, the speaker invites the listener to treat the PAL as if the type of situation named by a semantic frame were already familiar and name-worthy: the PAL's meaning is already part of the speaker's and audience's shared common knowledge.

At the same time, the event-type named by a PAL is *not* actually named by a word. Particularly in the case of uncommon PALs, the situation depicted is not actually discussed often enough to warrant its own label. Notably, comedians refer to the discussion of situations that are familiar but rarely discussed as OBSERVATIONAL HUMOR. An example of observational humor is provided by Jerry Seinfeld in (19):

> (19) "Some years ago you were given the option... you want to communicate with another person? you could talk, you could type. Well, once you had that option, well, that took half a *second*, talking lost, talking's *over*! Who wants to talk, oh my god, I gotta *talk*, do I have to *talk* to this person now? Talking is *work*, you have to make facial expressions that go with what you're saying, different hand gestures. You have to suck air in. You have to blow it out. Talking is over, it's obsolete, it's antiquated, I feel like a blacksmith up here sometimes. If you want I could text you this little thing, we could get the hell outta here." --Jerry Seinfeld discussing smart phones. https://slate.com/culture/2014/02/jerry-seinfeld-on-the-tonight-show-offers-his-own-take-on-smartphones-watch-video.html?pay=1695148694039&support_journalism=please

Stereotypically, observational humor begins with "Have you ever noticed?" or "Did you ever wonder why?" (Double 2013: 208-209). These formulations set up the situation as recurrent and

familiar to comprehenders, even if it is not. In this way the PAL construction is ideally suited to express observational humor: it presupposes the type of event or experience expressed is familiar and recognizable to comprehenders even though no word actually names it. PALs are easily decodable so there is no need for them to actually be familiar to comprehenders.

The act of coining a new word for a familiar situation generally strikes comprehenders as somewhat witty or humorous as long as the word is interpretable in context. This is exemplified by so-called *snigglets,* which are made-up words used to name familiar situations. For instance, a *cinemuck* has been said to describe "the combination of popcorn, soda, and melted chocolate which covers the floors of movie theaters" (Hall 1984); *snaglet* was coined to describe the type of word that is believed to be newly coined but which already in fact exists (Atkinson and Longman 1985:104); a *boastion* could be a lengthy description of one's own work in lieu of asking a question. As in the case of PALs, snigglets can be used for observational humor whenever they name a situation that is familiar but not regularly discussed.

Since PALs are easily interpretable, given that they rely on the regular constructions of English, speakers can exploit the PAL construction by expressing a type of situation or event that is in reality unlikely, seemingly random, idiosyncratic, even bizarre, as is illustrated by the example in (20) uttered by comedian Stephen Colbert:

> (20) Meanwhile, in "Salma Hayek's owl coughed a rat hairball on Harry Styles" news…
>
> (Colbert, 6/18/21)

In (20), Colbert treats the event of the actress's owl coughing up rat hairballs on the singer-songwriter *as if* it were familiar enough to be a lemma named by a word stem. This type of case, in which the situation is not in reality familiar at all but is treated as if it were, exemplifies Keller's (1994: 97ff) observation that people at least sometimes aim to "talk in such a way that you are noticed." Sanchez-Stockhammer & Uhrig (2023: 1) memorably discuss British "drunkonyms" -- someone at a pub may be *totally gazeboed* or *utterly pajamaed*. They observe that new terms can be coined in a suitable context to describe a state of drunkenness, regardless of the typical meaning of the underlined filler word. For other relevant discussions of playful or "extravagant" language use see Haspelmath (1999: 1055; also Bergs 2018; Eitelmann & Haumann, 2022; Hoffman 2022; Ungerer & Hartmann 2020).

To summarize, we argue that since PALs are phrases in a position normally reserved for words, they invite comprehenders to assume that the PAL token expresses a lemma-like meaning: a recurrent situation that the comprehender is expected to recognize. This in turn requires that the comprehender be already familiar with the type of situation depicted by the PAL. This is the sense in which PALs presuppose that listeners or readers share common knowledge with the speaker. Insofar as greater common knowledge between speaker and comprehender implies greater intimacy or familiarity, it may be that PALs would be judged as more informal than near paraphrases, as an anonymous reviewer had suggested. Importantly, however, we are not stipulating greater common knowledge: it follows from the fact that the

situation is treated as if it were a familiar word. Before we turn to the empirical studies, we briefly explain the motivation for and functional effect of PALs that are quotes.

4.2.PALs are often quotes

PALs very often have grammatical features associated with quoted speech (Göksel 2015; Jespersen 1924; Kornfilt & Trips 2017:3; Meibauer 2007:240; Pafel 2017; Pascual et al. 2012; Wiese 1996:188). In fact, PALs are often delimited in writing by quotation marks, thus bearing the typographical signature of quotes. Like other quotes, PALs can include imperative verb forms, terms of address, or first and second pronouns (*you, me*) without referring to the speaker or comprehender, as in examples (21)-(23):

(21) The "I got you" line COCA
(22) her don't-mess-with-me stance COCA
(23) A hey do-you-remember-me type text COCA

Quotes can be powerful. They provide an effective way of identifying or characterizing the content of political movements (e.g., *fight racism*), familiar situations (e.g., *it's not you, it's me*), attitudes (e.g., *life is good*), or types of people (e.g., *don't mess with me*). The fact that a well-chosen quote can evoke so much is why quotes are used as bumper stickers, worn on T-shirts, included in e-mail signature lines, written in greeting cards, and also used in the PAL construction.

In a classic article on the general function of quotes, Clark & Gerrig (1990) observe that quoted speech is a demonstration of the way someone talks or thinks. Therefore, quotes can be used to imitate a person or type of attitude for the purpose of characterizing them (1990: 765). Speakers may change the quality of their voice or physically adopt a pose as if to portray the type of person who might produce the quote. This then makes quotes a useful way to depict a type of speech, speaker or attitude.

As is true for quotes generally, quotes used in the PAL construction need not have been uttered. For instance, (24) does not imply that anyone has uttered the archaic phrase, *Woe is me.* Similarly, it is not necessary to assume anyone explicitly utters *blame the victim* (25) or *greed is good* (26). Instead, quotes are common in the PAL construction because they are a handy way to characterize or caricature a type of person or attitude. Because caricatures are commonly pejorative or sarcastic, we further predict that PALs should lend themselves to a sarcastic interpretation.

(24) a "woe is me" approach COCA
(25) another blame the victim attitude COCA2012
(26) the greed is good mentality COCA2012

Not all PALs are even hypothetical quotes, as those in (24)-(26) might be described to be. For instance, (27) does not indicate that anyone made a statement, but instead characterizes

the type of dire situation that leads to people to move to New Jersey of all places. Similarly, (28) does not suggest that anyone said "paint by numbers" despite the quotation marks; it instead depicts a process that is rote rather than creative.

(27) people-are-moving-to-Jersey stage of nationwide collapse Twitter

(28) the process would…yield some kind of "paint by numbers" feel to the finished work COCA

4.3 Empirical evidence for semantic claims

In Section 4.1 we claimed that instances of the PAL construction imply that PALs are treated as if they were words, with lemma-like meanings. Lemmas in turn presuppose familiarity with the semantic frame depicted. Here we test an implication of this idea, namely that a sentence containing a PAL should imply that the speaker shares more common knowledge with the comprehender than a sentence that conveys the same content without a PAL. We also observed that PALs lend themselves to describing recognizable situations that are not actually often talked about: the definition of observational humor. This predicts that PALs should tend to be judged more witty than close paraphrases. Finally, we observed that clausal PALs are most often quotes because quotes generally can be used to characterize, identify or *caricature* a type of person or attitude; this predicts that PALs should tend to be interpreted as more sarcastic than close paraphrases.

We test these hypotheses in three separate surveys:

1) Common knowledge surveys:
    a. Do PALs presuppose more common knowledge between speaker and listener/reader than paraphrases?
    b. Do PALs indicate more "shared background" with the listener/reader than paraphrases?
2) Wittiness: Are PALs are judged more witty than paraphrases?
3) Sarcasm: Are PALs are judged more sarcastic than paraphrases?

Rather than attempting to define the common language terms *common knowledge, wittiness,* and *sarcasm*, we operationalized them by asking independent groups of naive English speakers to make judgments based on their own interpretations (see section 4.4). But first we normed the stimuli as follows.

Norming the stimuli pairs on semantic similarity; estimating frequencies of PALs

The 100 sentence pairs used as stimuli in the main surveys were carefully constructed and normed so that PAL sentences were confirmed to be highly similar in content to their paraphrases. Moreover, the same exact phrase used as a PAL was included in 64 of the 100 paraphrases (but not as a PAL); and 40 of the paraphrases included the same quoted phrase (as a complement of a verb rather than as a PAL). These binary factors were also included in

analyses, as preregistered. We also estimated the (log) frequencies of each PAL phrase using the billion-word COCA corpus.

Participants

187 L1 English speakers were recruited from the crowdsourcing platform Prolific (*Mean age* = 40.1). 79 participants were male, 105 were female and three were nonbinary. No participants were excluded.

Procedure

One hundred and five PAL sentences were created, inspired by naturally occurring sentences containing PALs in the COCA corpus (Davies 2008), with a range of frequencies. A paraphrase of each sentence was constructed with the intention of expressing nearly synonymous content. The initial set of sentence pairs was randomly divided into seven lists of 15 potential stimuli-pairs and 12 fillers. Each participant saw one list and was asked how semantically similar each pair of sentences was, using a sliding scale from 0 to 100. The semantically similar filler pairs were then used to test whether the target pairs were highly semantically similar, as intended.

Filler pairs

The total set of 12 filler pairs is provided in Table 5. They included six sentence pairs that involve standard alternations or other nearly synonymous sentences. Another six sentence pairs were intended to have quite distinct meanings.

Table 5: Filler sentences provided to all participants included 6 nearly synonymous pairs and 6 clearly semantically distinct pairs. Mean similarity ratings on a scale of 1-100 are provided in left-hand column.

Fillers (presented in random order)		
Intended to be highly semantically similar ***M = 93.0***	Bruce gave him three pieces of blueberry pie.	Bruce gave three pieces of blueberry pie to him.
	Emily loaded the truck with precious cargo.	Emily loaded precious cargo onto the truck.
	The tree was struck by a huge lightning bolt.	A huge lightning bolt struck the tree.
	It was nice of Daisy to save water.	It was good of Daisy to save water.
	Juan drove her crazy.	Juan drove her insane.
	Keisha noticed a child who was asleep.	Keisha noticed a sleeping child.
	Sophia, a brilliant journalist, unlocked the secrets of a mysterious murder.	Sophia, a brilliant scientist, unlocked the secrets of a mysterious disease.
Intended to be semantically different ***M = 28.7***	The Enchanted Reef, a mystical underwater wonderland, captures the imagination of all who visit.	The Enchanted Reef, a magical amusement park, costs a fortune.
	The Enigmatic Portrait, a masterpiece by	The Enigmatic Portrait, a masterpiece by a

a reclusive artist, evokes intrigue and fascination.	reviled politician evokes scorn and dismissiveness.
The Evergreen Jungle, a biodiversity hotspot, teemed with life and natural wonders before development took over.	The Evergreen Jungle, a biodiversity hotspot, teems with life and natural wonders.
Lily is a talented pianist who mesmerizes audiences with her music.	Lily is a talented actor who captivates audiences with her performances.
Everest Summit, an awe-inspiring peak, challenges adventurers to conquer its heights.	Tippy Summit, an awe-inspiring peak, challenges beginner climbers who try to scale its walls.

Results

Judgments on filler pairs conformed to our expectations: nearly synonymous fillers were judged highly similar ($M = 93.0$); low-similarity fillers were judged to be dissimilar ($M = 28.7$). The five least-similar pairs of potential target stimuli were removed since the goal was to include highly similar pairs. The target stimuli pairs were rated on average 90.4 ([63.2, 98.3]). Using a linear mixed model with similarity as the output variable and target items as the reference level, with random intercepts for subjects and items, results show that the target pairs were not less similar than the nearly synonymous filler pairs ($ß = 2.60$, $p = .496$), and were far higher in similarity than the low-similarity fillers ($ß = -61.71$, $p = <.0001$). Mean similarity ratings, centered to avoid collinearity, were included in all analyses, as preregistered.

Estimating log frequencies of PALs used as PALs

We performed searches of the billion-word COCA corpus (Davies 2008) on August 22, 2023, using the interface provided online. To estimate instances of phrases used as lemmas, we searched for the phrase with and without quotes followed by a NOUN. We then filtered results by hand to remove instances that were not PALs. For example, when searching for the PAL phrase, *"it only takes one" NOUN* and *it only takes one NOUN*, the latter search returned *it only takes one person to*, which is not a PAL and so was excluded. We included estimated log frequencies of each PAL used as a PAL in all analyses.

4.4 Preregistered studies 1-3: Common knowledge, Wittiness, Sarcasm

Preregistration

Hypotheses, experimental design, number of participants, recruitment method, exclusion criteria, and planned analyses were preregistered at As.Predicted (see Appendix 1). Preregistration, items, data, and analyses are available here: https://researchbox.org/3143&PEER_REVIEW_passcode=FLAFHF.

Participants

We recruited 700 adult English speakers from Prolific. Surveys each began with two catch trials, neither of which included a PAL construction. Participants were excluded from the study for failing either one, which left a total of 685 participants (*Mean age* = 38.4; 308 Male;

359 Female; 15 non-binary, 3 prefer not to say). Each participant took part in a single survey, and we additionally excluded participants who had taken part in the norming or pilot surveys.

Procedure

Surveys asked separate groups of participants to perform a two-alternative-forced-choice task in which they chose whether a sentence containing a PAL construction or a close paraphrase that did not contain a PAL 1) implied that the speaker assumed more "common knowledge"; b) or shared more "shared background" ; 2) was more "witty (or clever)"; or 3) was "more sarcastic." 100 stimulus-pairs were divided pseudo-randomly into ten lists of ten experimental and 12 filler trials apiece. Each list included PALs that appeared in COCA as PALs with a range of raw frequencies from one to greater than 200 times. One stimulus was removed from analysis for accidentally including a PAL phrase in the paraphrase. Example trials in two of the surveys are provided in Figure 1.

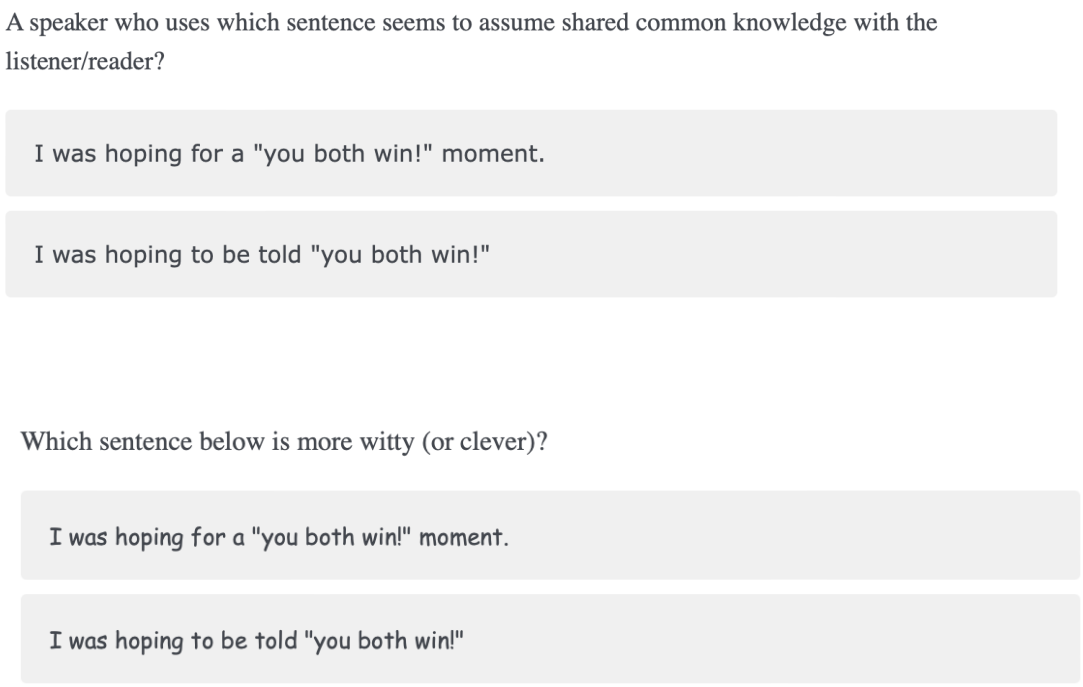


Figure 1: Sample stimulus in Common knowledge (top) and Wittiness (bottom) surveys

Stimuli

Table 6 includes ten sentence-pairs used in one of the ten lists, which each contained PALs with a range of estimated frequencies.

Table 6: Sample list of stimuli-pairs used in the Common knowledge, Wittiness, and Sarcasm surveys

Sentence with PAL construction	***Paraphrase without a PAL***
It's a pleasure to have a friend with a "can do" attitude.	It's a pleasure to have a friend with a positive attitude.
Stay in your seats until the "fasten seat belt" sign has turned off.	Stay in your seats until you see that the sign to fasten your seat belts has turned off.
They started a "blame the media" campaign.	They started a campaign to blame the media
Few employees have a "do all this extra work because it's good for the company" attitude.	Few employees have an attitude that you should do all this extra work because it's good for the company.
Keisha was annoyed to get an "alignment failed" message.	Keisha was annoyed to get a message that said "alignment failed."
The proud father posted another "Noah sleeping" moment.	The proud father posted another moment showing Noah sleeping.
Principal Snyder seemed to make a "let's expel the troublemaker" campaign.	Principal Snyder seemed to make a campaign to expel the troublemaker.
Taylor, no one else has a "Kiss the Gardener" sign.	Taylor, no one else has a sign that says "Kiss the Gardener."
She criticized the "guess what I was thinking" line.	She criticized the line that said "guess what I was thinking."
Seth's father often uses was the "it only takes one!" line.	The line Seth's father often cited was "it only takes one!"
It's a pleasure to have a friend with a "can do" attitude.	It's a pleasure to have a friend with a positive attitude.

Factors

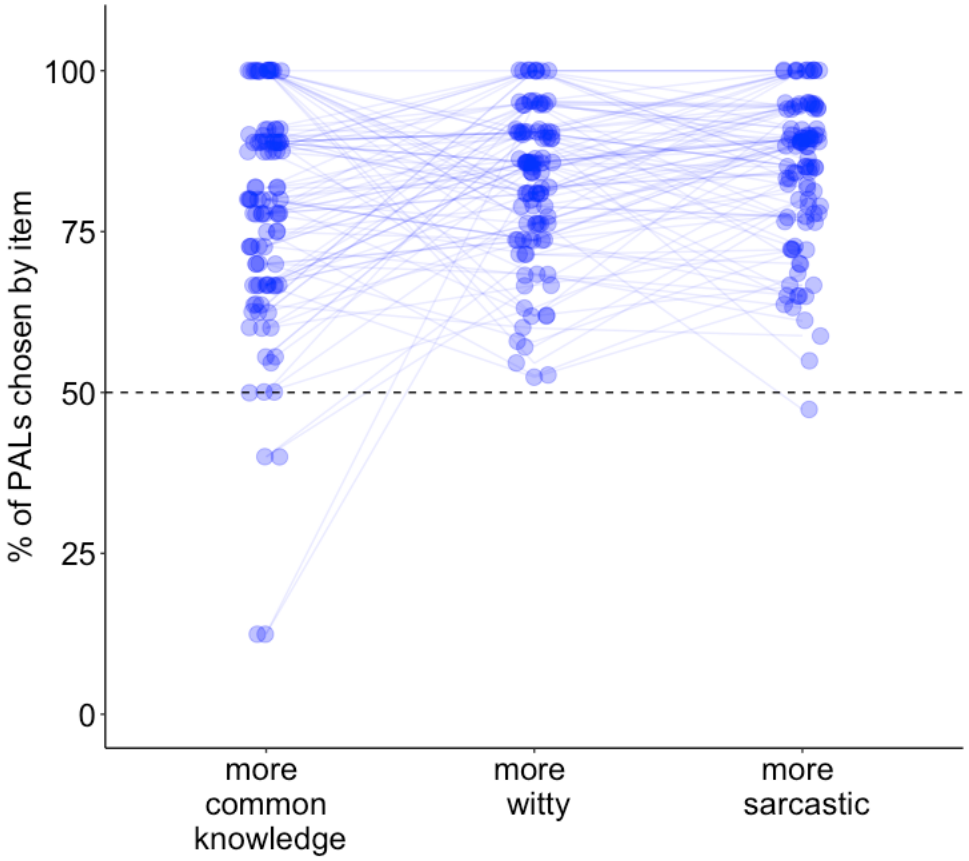
The dependent variable of interest was the proportion of PAL sentences chosen over the paraphrases. As preregistered, all analyses include the following fixed factors: mean similarity rating for each target sentence pair as determined by the norming study (section 4.3); the log frequency of each PAL phrase appearing in the billion word COCA corpus of American English as a PAL phrase (Davies 2008) ($M = 0.64$, [1, 3.38]) (section 4.3); the length in words of each PAL phrase ($M = 4.15$ [2, 11]); whether the paraphrase as well as the PAL sentence included a quote; and whether the identical phrase used as a PAL was included in the non-PAL sentence. As preregistered, random intercepts were included for participants and items. Participant slopes are not relevant since each person witnessed only one survey. The order of stimuli presentation was randomized for each participant and the order of presentation of each sentence within a pair also varied randomly.

Results

The percentage of each of the 100 PAL sentences judged as implying more common knowledge with the comprehender, more witty, or more sarcastic by participants is represented in Figure

2. The bias toward selecting PAL sentences over their paraphrases is clear in each survey, and for nearly every item.

Figure 2. Mean percentage of participants who selected the PAL-sentence over its paraphrase for each of 100 items on each of the separate surveys. Lines connect the same item across surveys.



Generalized linear mixed models were constructed, with choice (PAL or paraphrase) as the output and bias toward choosing PALs quantified by the intercept. Predicted results were confirmed by independent groups of participants:

1) Sentences containing PALs implied that the speaker and listener shared more common knowledge ($M = 77.3\%$ $ß = 1.69$, $z = 4.80$ $p < .0001$).
    b. A separate survey used the wording ("shared background") with the comprehender and found an effect of similar magnitude ($M = 74.3\%$, $ß = 1.78$, $z = 4.62$, $p < 0.001$).
2) Sentences containing PALs were judged to be wittier than their paraphrases ($M = 82.2\%$, $ß = 2.58$; $z = 8.48$, $p < 0.001$).

3) Sentences containing PALs were judged to be more sarcastic than their paraphrases (M = 84.5%, $ß = 2.71$, $z = 8.54$, $p < 0.001$).

No significant influence on responses was found for semantic similarity nor whether the PAL and its paraphrase contained the identical phrase, nor for the estimated log frequencies of the PAL phrases. PALs were slightly less easily distinguished from paraphrases when the paraphrase as well as the PAL included a quote (i.e., quoted speech, not as a PAL). When the paraphrase included a quote there was a significant negative effect on the choice of PALs in the wittiness and sarcasm surveys (wittiness: $ß = -0.85$; $z = -3.60$, $p < 0.001$; sarcasm: $ß = -0.75$; $z = -3.05$; $p = 0.002$), and a significant positive effect on the shared common knowledge survey ($ß = 1.06$; $z = 3.77$, $p < 0.001$). Model outputs that include all fixed and random factors for each of these surveys are provided in Appendix 1 (Table A.1).

Exploratory analyses investigated potential correlations among the three surveys. Since the surveys that asked about an increase in common knowledge or shared background were intended to operationalize the same thing, it is reassuring that their results were highly correlated (Pearsons $r = .62$, $p = <.00001$). How likely a PAL item was to be judged as more witty also correlated with how likely it was to be judged more sarcastic (Pearson's $r = .46$, $p < .0001$). There was also a smaller but significant correlation between how likely an item was judged to imply more common knowledge and to be more witty ($r = .24$, $p < .02$). No significant correlation was evident between an item implying more common knowledge and being interpreted as more sarcastic ($r = .14$, $p = .14$).

Study #4: Effect is robust to frequency of PAL phrases

To determine whether the lack of evidence for a frequency effect was due to the fact that we had included relatively few high-frequency PAL phrases in each list, we created a single new list that included only high frequency PAL phrases (log-frequencies > 2.0): *anything goes, all you can eat, can do, do it yourself, do not disturb, must win, must do, must read, must see, pay as you go, wait and see, know it all, trickle-down.* This smaller survey included the same procedure and analyses of responses as before. It was run on 80 new English speakers on Prolific. All details are provided in Appendix 2, including full models (Table A.2). Once again, results demonstrate a significant bias toward selecting the PAL-sentence over the paraphrase in each survey, and of roughly the same size as when the high-frequency items were interspersed among relatively more novel PAL tokens. That is, PAL sentences imply more common knowledge between interlocutors even for PAL phrases likely familiar to all speakers (M = 72.88% $ß = 1.53$; $z = 2.85$, $p = 0.004$). And even though commonly used PALs are not obviously witty or sarcastic, they were judged to be slightly more witty and sarcastic than close paraphrases: wittiness: $M = 79.81$; $ß = 2.34$; $z = 3.49$, $p < 0.001$; sarcasm: $M = 84.46$, $ß$ =.3.91; $z = 5.06$; p <0.0001.

Discussion

Results patterned as predicted by the observation that PALs appear in the position of a word, which has lemma-like meanings: English speakers find sentences containing PALs to imply more common knowledge with the comprehender than close paraphrases do. This is not easily attributed to differences in content because the sentence pairs had been separately normed and found to be as similar in content as classic alternations and other near paraphrases; moreover, judgments revealed no influence of the variation in similarity between item pairs, not even from whether the same exact phrase was used in the PAL sentence and its paraphrase. Instead, we attribute the increased perceived common knowledge to the fact that the situation is depicted by a sentence that is treated as if it were a word and, again, the meaning of a word—its lemma—is presumed to depict a situation that is familiar to the addressee.

As predicted by the idea that there is humor in the discussion of familiar situations that are not commonly discussed, PALs were separately judged significantly more witty than their paraphrases and more sarcastic. Finally, we found that when both the PAL sentence and its paraphrase included quoted speech, participants found it slightly harder to distinguish which was more sarcastic. This makes sense once we keep in mind that quotes are commonly used to mimic or caricature speech; that is, both the quote as well as the PAL could be interpreted as sarcastic.

The (log) frequency of the PAL phrase in corpora did not have a significant effect in any of the studies. In the first three studies, each participant judged only one or two high-frequency PALs, which appeared more than 100 times as PALs in the billion-word COCA corpus. Each participant judged four or five PALs that were novel, appearing only once as PALs; the other three to five PALs were estimated to appear between one and 100 times in COCA. A fourth study checked whether the lack of evidence for a frequency effect was due to the fact that relatively few high frequency PALs were included as stimuli. For this study, we re-ran the same surveys on a single list of items that included only the 14 highest-frequency PALs (e.g., *all you can eat, can do, trickle-down, do it yourself*). Results replicated the significant bias toward selecting the PAL sentence over the paraphrase in each of the surveys. That is, PAL sentences imply more common knowledge between interlocutors even when the PAL phrase is likely familiar to all speakers. And even though commonly used PALs are not obviously witty or sarcastic, they were judged to be slightly more witty and sarcastic than close paraphrases.

5. Subregularities of the PAL construction

As observed in section 3, not all PAL tokens occur as modifiers of Nouns. At the same time, corpus searches of the COCA corpus revealed relatively few other types of PALs. This may be because it is quite difficult to search for the other uses of PALs (Hein 2017; Trips 2012), or it may be that the parses on which the COCA corpus interface relies do not treat PALs systematically, which could make our searches inaccurate. Nonetheless, our searches identified several remarkably narrow subtypes of PALs which are characterized on the left side of Table 7. If speakers are in fact sensitive to such narrowly delimited types of examples, it would require that we recognize that they are included as part of speakers' knowledge of English.[3]

Table 7: Narrowly defined subtypes and paraphrases hypothesized to be conventional. Participants were asked to decide which was more natural for a single instance of each type.

Hypothesized to be conventional subtypes *(instances)*	**Minimally different instances**
***must*-VERB:** *must-purchase, must-go, must-keep must-cook, must-happen, must-fix, must-check, must-travel, must-hike* *e.g., It definitely makes our must-hike list!*	*should-purchase, should-check, ought-to-keep, have-to-cook, have-to-fix, can-happen, might-interview, can-travel, might-go, ought-to-hike* *e.g., It definitely makes our should-hike list!*
***a simple* PAL**[4] *e.g., A simple "I would love to, but I'm busy that night" more than suffices.*	*a short/sweet/winning/basic/brief* PAL *e.g., A short "I would love to, but I'm busy that night" more than suffices.*
***Don't* PAL$_{quote}$ *me*:** PAL is a direct quote from the immediately preceding context used as a transitive verb in an interdiction context. *e.g.,* A*: And there it is.* *B: Don't "there it is" me, buddy.*	Same quote but in non-interdiction context; or similar meaning but not a direct quote. *e.g.,* *A: And there it is.* *B: I heard you "there it is" me, buddy.*
the old* PAL *N *e.g., Dredging up the old "you guys do it too" defense is the weakest form of deflection.*	*the tired/familiar/annoying/classic/big* PAL *N* *e.g., Dredging up the tired "you guys do it too" defense is the weakest form of deflection.*

To determine whether speakers are implicitly aware of the four narrowly defined subtypes depicted in Table 7, we preregistered (Appendix A.3) and administered a final two-alternative forced-choice survey to determine whether instances of these subtypes were judged more NATURAL in comparison to minimally different instances that did not conform to the narrow subtypes. The minimally different versions are depicted on the right side of Table 7.

Importantly, in this survey, none of the PAL tokens were themselves common. For instance, *must*-VERB is frequently instantiated by *must-read, must-see,* and *must-win,* so none of these examples was included, because we assume that English users are familiar with frequent tokens. Each *must*-VERB instance appeared no more than 10 times in the billion-word COCA corpus, and most did not appear even once.

Participants

A new group of 80 adult native English speakers were recruited from Prolific. Two catch trials were included, and participants were excluded if they failed either one. After removing one

additional participant on the basis of implausible age, 74 participants remained (*Mean age* = 39.12; 38 male; 36 female).

Stimuli

Each instance of what we hypothesized was a conventional subtype was paired with a minimally different novel sentence that, by hypothesis, included a non-conventional instance of the PAL construction. Ten stimuli pairs for each subtype were created. Preregistration, data and code for this study is available here, https://researchbox.org/2109&PEER_REVIEW_passcode=KBKQBX and will be made available upon acceptance.

Procedure

To avoid priming effects within the experiment, each participant saw only a single instance of each hypothesized-to-be-conventional subtype paired with its minimally different PAL sentence (see von der Malsburg, Poppels, and Levy 2020 for motivation for single trial studies)

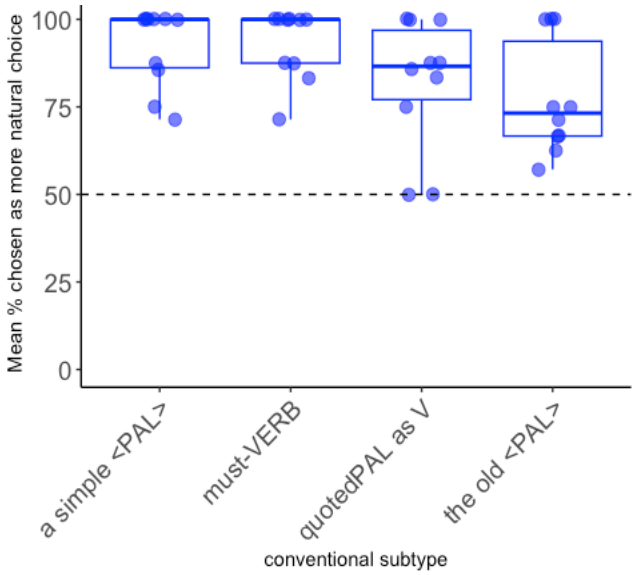
Factors

The dependent variable of interest is which sentence is judged more natural, when provided a choice between two PAL sentences, where only one was hypothesized to be a productive instance of a conventional subtype. With the exception of the PAL as Verb subtype, each pair of sentences differed by at most one word, which was intended to be similar and appropriate in context: log frequencies of the words that differed were estimated based on searches for those single words in isolation within the COCA corpus. We included the differences in log frequency between the two words as a fixed effect for the three narrow types that included this information. In the case of PAL as Verb type, the foils differed from the conventional cases by either not quoting from the immediately preceding context or using a preceding quote but in a non-interdiction context. In order to follow the preregistered analysis, we treated the difference in log-frequencies as zero for these cases. Random intercepts for items and participants were included.

Results

As is evident in Figure 3, participants in fact demonstrated a bias toward choosing instances of each of the PAL subtypes, hypothesized to be conventional, as being more natural (86.09%).

Figure 3: Participants recognized each of 4 narrowly defined subcases as more natural than paraphrases



The preregistered generalized linear model confirmed the overall bias overall ($ß = 2.28$; $z = 6.086$, $p < 0.0001$), and the tendency to choose the hypothesized subtypes as more natural held for each of the four narrowly defined subtypes, considered independently (see Appendix 3, Tables A.4-A.7 for full models). The frequency differences between the words used in the conventional and non-conventional terms (e.g., *must vs should; simple vs short; old vs tired*) showed no significant effect on whether participants considered the instances of conventional subtypes to be more natural.

6. Theoretical implications

Usage-based constructionist approaches are in principle well-suited to account for the PAL construction (Bagasheva 2017; Finkbeiner and Meibauer 2016; Hein 2017; Trips 2012), because lexical and grammatical constructions are treated as the same basic type of entity. That is, words, partially filled words (aka morphemes), collocations, lexically filled idioms, and partially filled idioms are all *constructions*, as are more traditional grammatical constructions including verb phrases, conjoined phrases, conditionals, relative clauses, and questions. In addition, certain constructions are already recognized to combine certain properties that are typical of morphology and other properties that are typical of phrases; these include for instance, a wide range of complex predicates and multi-word idioms and collocations (Ackerman and Nikolaeva 2014; Booij 2002; Desagulier 2016; Family 2006; Goldberg 2003:220; 2006:5; Hilpert 2015; Jackendoff and Audring 2020; Traugott and Trousdale 2013: 182-190).

According to the constructionist perspective, both words and phrasal constructions can be morphologically fixed, but they often instead contain open "slots," to be filled by other constructions, which may themselves contain open slots. This inclusive definition of CONSTRUCTION encompasses any learned pairing of form and function, regardless of its degree of complexity or level of abstraction (Goldberg 2003:220; 2006:5). A few examples illustrating multiple levels of abstraction for the English Noun Noun compound and PAL constructions are provided in Table 8.

Table 8: Examples of English words and phrases that vary in degree of abstraction

	Noun Compounds	**PALs**
lexically specified	*veggiewrap*	*must-read*
	cheeseburger	*can-do attitude*
partially open	*N-burger*	*a simple* PAL^0
	N-wrap	*the old* PAL^0 N
	N-roll	
fully open and abstract	$[_{\text{N0}}\ \text{N}^0\ \text{N}^0]$	$[_{\text{N'}}\ \text{PAL}^0\ \text{N}^0]$

The usage-based constructionist approach captures linguistic knowledge in a CONSTRUCTIONNET (or CONSTRUCTICON), thereby massively extending the familiar lexicon, which is already recognized in most linguistic frameworks to require a high-dimensional network (e.g., Aitchison 2012). In principle, the current analysis is translatable into other frameworks, particularly if the following points are recognized:

a. A new type of grammatical category is posited, which has the distribution of a word but the internal syntax of a phrase or quote, including potentially a full sentence (a PAL^0) [section 3].
b. The interpretation captures the fact that PALs are construed as describing situations that are familiar to the listener, as is true of lemmas, while designating a situation that may not be regularly discussed, as is true of (novel) phrases [section 4].
c. A recognition that constructions (including PALs) can have distinct rhetorical functions such as being wittier or more sarcastic than paraphrases [section 4].
d. Some means is needed to capture conventional instances and multiple related but distinct conventional subregularities of English PALs, in addition to their most common use as prenominal modifiers [section 5].

Analyses of the English PAL constructions that include these four points would capture both the form of the English PAL construction and its function. If in addition, form and function are related directly, rather than as independent modules, such an analysis would offer a notational variant of a constructionist analysis. That is, by positing a special pairing of form and function to account for PALs, the proposal would acknowledge that a PAL construction is required,

which is what we advocate. Importantly, by acknowledging its unusual syntax directly, we have been able to explain why it has the special functional properties it does rather than simply stipulating those properties. Any approach that fails to recognize that PALs are treated as if they were words while not actually being words misses the chance to explain rather than merely stipulate the interpretation of the construction reviewed in section 4.

Notice that the first point above, (a), is incompatible with a strict division between the lexicon and syntax (Bresnan and Mchombo 1995; Chomsky 1970; DiSciullo and Williams 1987; Pinker 1999; see Bruening 2018 for critique and discussion). For instance, if PAL tokens were generated syntactically and then entered into the lexicon before being reintroduced into the syntax, as depicted in Figure 4, the procedure indicated by the blue arrow at the bottom of Figure 4 would violate the assumption that syntax cannot operate within lexical items (the "lexical integrity principle"; Booij 2009; Lieber 1992; Pinker 1999; Trips and Kornfilt 2017). The constructionist approach presumes words and grammatical constructions are accessed in parallel so there is no reason to assume one systematically precedes the other.

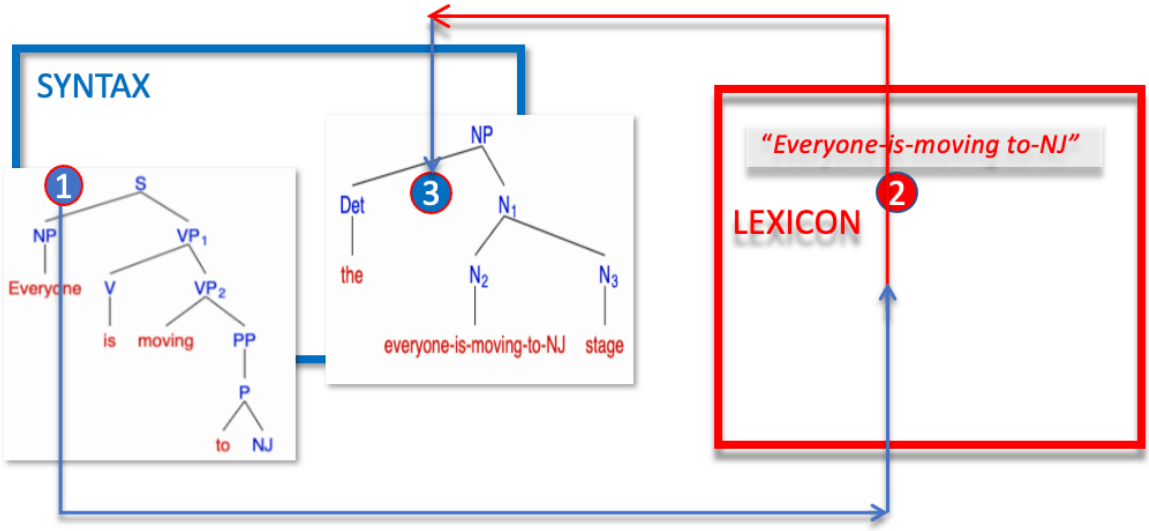


Figure 4. PALs violate the assumption that syntax cannot provide input to the lexicon (indicated by the blue arrows)

We have seen that PALs differ in their distribution from Nouns or Adjectives. If one were determined to avoid positing a PAL modification construction along with the handful of narrowly defined related subtypes, one would need to instead posit multiple special zero-level heads or half a dozen lexical rules or unrelated constructions, thereby missing an important generalization.

To account for its use as a prenominal modifier, we propose the prenominal PAL construction depicted in the center of Figure 5. This construction is related to both the English compound construction and the modifier construction, inheriting some properties from both. The thinner outline indicates that the PAL construction is less frequent than either of these other

constructions with which it shares aspects of its form (prenominal position) and its nominal modification function (Barlow and Kemmer 2000:10). By representing the PAL as a zero-level category and the prenominal modifier PAL construction as an $N^{/}$, we capture the combinatorial properties observed in section 3. Also included in Figure 5 are the narrowly defined conventional PAL constructions confirmed in the Conventionality (#5) Survey. A few familiar tokens are represented as well (e.g., *do-it-yourself, know-it-all*), while many more are omitted for the sake of readability.

Memory is cheap, while computation requires time and resources. Humans have a vast memory for quite specific information about language, including relative frequency information and complex semantic information (e.g., Goldberg, 2019: chapter 1). Moreover, nearly all generalizations have exceptions both in language and in life. To represent information about related constructions that may specify conflicting information, we make use of NORMAL MODE INHERITANCE (Diessel 2023:6-9; Flickinger, Pollard, and Wasow 1985). Conflicts are addressed by the inheriting construction, which specifies its own constraints. In this way, normal mode inheritance captures relationships among conventional constructions (Croft & Cruse 2004; Desagulier 2016). It is akin to Jackendoff's (1975) "redundancy rules," which were used to fully specify related but distinct information in verbs' representations. Importantly, normal mode inheritance is crucially different than complete inheritance which requires that *all* information from mother be inherited by daughter nodes (Flickinger, Pollard, and Wasow 1985; Müller 2010). Complete inheritance is essentially a device used to capture exceptionless generalizations and avoid redundancy. It is unsuitable whenever a node is allowed more than a single mother node, since specifications in mother nodes may conflict with one another. It is also not appropriate for capturing relationships between a more general and more specific instance if there are any conflicts between mother and daughter nodes. Normal inheritance can capture the idea that constructions are not listed but emerge as generalizations within a network of partially overlapping representations, which MOTIVATE one another (Goldberg 1995:73-81).[5]

We argue that the function of the English PAL construction is likewise motivated by its form. In particular, by treating a phrase as if it were a word root, the construction encourages listeners to treat the phrase as if it had the meaning of a word root: The meanings of word roots—lemmas—label situations or entities that are "name-worthy" and presumed familiar to both speaker and addressee. That is, the function of the construction is *not a* tacked-on stipulation.

We clarify the relationships indicated in Figure 5 from top to bottom. Both compounds and Adj + N modification constructions motivate the PAL N construction, in that the PAL N construction shares properties with each of these more frequent constructions. Specifically, it shares with both constructions the prenominal slot for the modifier. Like the compound construction, the PAL N construction forms a tight semantic and phonological unit: stress typically falls within the PAL, rather than the head N, echoing the stress pattern typical of compounds. On the other hand, like Adj + N combinations, the PAL N construction cannot be recursively embedded within another PAL N construction.

As presumed by most previous work, PALs prototypically appear as modifiers of Ns. A few familiar phrases are provided (*know it all, do it yourself, pay as you go*) to exemplify a few high frequency, familiar instances. Finally, as was demonstrated in section 4.3, there exist certain additional subregularities, including PALs introduced by *a simple*, or *the old,* and the cluster of semi-productive PALs consisting of *must* + Verb.

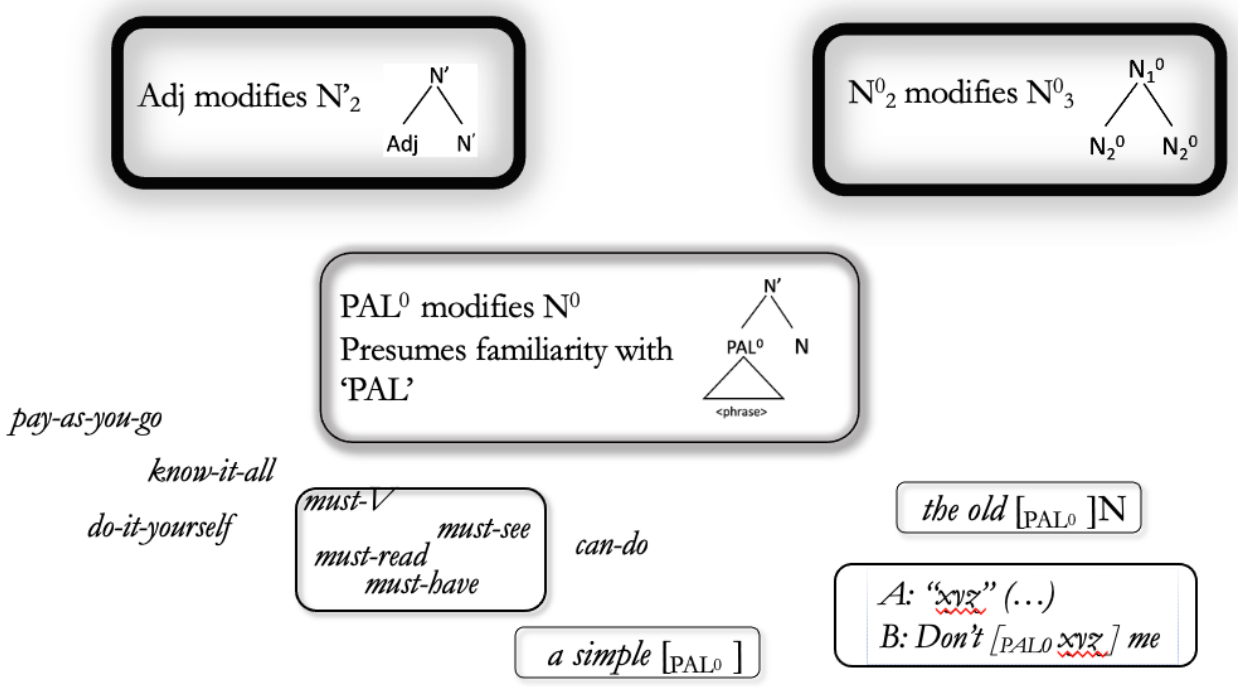


Figure 5 A corner of the ConstructionNet. The PAL construction (center) coexists with Adjectival modifiers and NN compounds (top), which motivate its form and function. The productive subtypes identified in 4.4 are also indicated, along with a handful of the dozens of conventional instances. Motivation links are omitted to avoid clutter.

7. Comparable PAL constructions in other languages

We have defined PALs as phrases that are treated as if they were simple words and argued that this is why they are assigned lemma-like meanings. By characterizing PALs this way, we avoid reference to any specific grammatical property of English or other Germanic languages, facilitating the identification of comparable constructions cross-linguistically (see Croft 2016; Haspelmath 2010, 2016; Himmelmann 2022 for discussion). Indeed, comparable constructions have been reported in Turkish (Trips and Kornfilt 2015) as well as in other West-Germanic languages, including German, Dutch and Afrikaans (Hein 2017; Trips and Kornfilt 2015; Meibauer 2007) as illustrated in (29a-c). As is the case in English, each of these languages offers distinct, more frequent relative-clause and complement clause constructions (e.g., Göksel 2015; Kornfilt and Vinokurova 2017), while PALs are used in a constructional slot usually reserved for open-class zero-level modifiers such as nouns, resembling NN compounds. The

similarity to NN compounds is indicated in Turkish by the compound marker affixed to the head noun.

(29) a. **Dutch** (Germanic; Meibauer 2007: 235, orthographically presented; our glosses)

lach *of ik* *schiet* *humor*
laugh.IMPR or 1SG shoot.PRS.1SG humor
'Laugh-or-I-shoot humor'

b. **Afrikaans** (Germanic; Meibauer 2007: 235, orthographically presented; our glosses)

God *is* *dod* *theologie*
god COP.PRS.3SG dead theology
'god-is-dead theology'

c. **Turkish** (Turkic; Trips and Kornfilt 2015: 307; their parsing, glosses, translation)

"iç *çamasir-ın-ı* *göster" oyun-u*
internal laundry-3SG-ACC show" game-CM
"show your underwear" game

An apparently comparable construction also appears in Modern Hebrew and Brazilian Portuguese, although as far as we know, they have not been reported in the literature (see Becker 2023 for relevant discussion of lexicalization of complete sentences in Hebrew). Notably, in these cases, PALs do not appear in NN compounds, even though such compounds exist, albeit infrequently (e.g., Rio-Torto and Ribeiro 2012). Instead, the comparable construction in Hebrew and Brazilian Portuguese frequently appears as the complement of a preposition, more typically filled by a noun or an NP in both languages (e.g., Polak-Yizhaki 2017: 40-41 for Hebrew). That is, when a clause, which can be a sentence and is commonly a quote, follows *ʃel* (in Hebrew) or *de* (in Brazilian Portuguese), respectively, it appears to receive the same lemma-like interpretation demonstrated here to hold in English.

Insofar as this is the case, it implies that the PAL construction need not resemble NN compounds. But as in English, the lemma-like interpretation seems to appear because a clause is used in a slot typically of a word. Critically, each language that offers a comparable PAL construction has another way of expressing clausal modification (relative clauses). If simple modifiers and clausal modifiers routinely appear in the same slot, as is the case in Japanese for instance (e.g., Gil 2013; Matsumoto 1988, 1989; Matsumoto et al. 2017), the clause would not be treated as if it were a simple word. That is, in order to receive a lemma-like interpretation, a PAL construction needs to appear in a position that is typical of single words and atypical of clauses. The Hebrew and Brazilian Portuguese PALs are illustrated in (30 – 32) below. The (a) examples illustrate the deployment of a simple word, a noun, in the position after Hebrew *ʃel* or

Brazilian Portuguese *de*. The (b) examples illustrate the deployment of the PAL construction following the same preposition.

Hebrew (Afro-Asiatic, Semitic; Twitter)

(30) a. *keta ʃel student-im*
section of student-PL
'a students' thing'
b. *keta ʃel mi=ʃe yodea yodea*
section of who=SUB know.PRS.3MSG know.PRS.3MSG
'an if-you-know-you-know thing'

(31) a. *ani mitʁageʃet be=ʁama ʃel kala*
1SG be.excited.PRS.FSG in=level of bride
'I'm excited to the level of a bride'
b. *ani mitʁageʃet be=ʁama ʃel ani od ʁega boxa kan*
1SG be.excited.PRS.FSG in=level of I more moment. cry.PRS.FSG here
'I'm excited to the level of "I'm gonna start crying here in a minute"'

Brazilian Portuguese (Indo-European, Romance; NOW corpus)

(32) a. *o clima ameno de Cal*
DEF.MSG climate pleasant of Cal.
'the pleasant climate of California'
b. *o clima ameno de "eu te ajudo voce me ajuda e está tudo bem"*
DEF.MSG climate pleasant of I you help.PRS.1SG you me help.PRS.2SG and COP.PRS.3SG all good
'the pleasant climate of "I help you, you help me, and everything is good"'

We predict that comparable PAL constructions should imply a shared familiarity with the type of event or situation expressed by the PAL. This appears to be the case but requires empirical confirmation that falls beyond the scope of the current paper.

8. Limitations

We have primarily focused on English data in the current work while observing intriguing comparable constructions in Hebrew and Brazilian Portuguese. Future work that compares constructions across a systematic sample of languages would be valuable. Such work, however, may find it challenging to rely on published reference grammars, a common data source in large typological comparative projects, since infrequent constructions are seldom included in such grammars.

Further, we have restricted the current analysis to phrases that include a verb, in an effort to focus on clear cases. However, in principle, other types of phrases (or quotes) used as if they were words should evoke a lemma-like meaning as well. Likewise, we have not included PALs that involve quotes from a non-English language, or simple noises (Bresnan and Mchombo 1995:194), as in (33). We expect these can be assimilated to the analysis provided here, but we leave this too for future work.

(33) kids are 'doo-doo-doo-doo-doo-doo'-ing the day away. COCA

9. Conclusion

By analyzing the function of the relatively infrequent Phrase-as-Lemma, PAL, construction in English, the current study offers evidence about the nature of our grammatical knowledge. Specifically, by representing the surface syntax as directly as possible—by positing a special grammatical category with the external syntax of a word, but the internal syntax of a phrase—we are able to explain why comprehenders imbue it with the functional properties they do.

The English Phrase-as-Lemma construction provides speakers with a linguistic analogue of the comedian's observational humor: PALs presuppose shared familiarity with a situation that is not often discussed. This unique function arises, we claim, because a phrase—even a full sentence—is deployed in a position otherwise restricted to a word, thereby presupposing that the situation named by the phrase has a lemma-like interpretation, and lemmas necessarily express familiar concepts. Yet in the case of PALs, the "familiar situation" is not in fact sufficiently nameworthy to be assigned a word. Preregistered, crowdsourced surveys confirm that sentences containing a PAL construction indicate that the speaker assumes more common knowledge with the comprehender (Study 1) when compared with highly similar paraphrases. Sentences with PALs are also judged to be more witty (Study 2, replicating Meibauer 2007 for German) and more sarcastic (Study 3). Remarkably, these factors are evident even in extremely frequent PAL tokens when compared to paraphrases (Study 4). To be sure, we are not claiming that all or most PAL tokens imply a close intimacy with the comprehender, are laugh-out-loud funny, or are witheringly sarcastic. But naïve English speakers recognize that the construction adds a dash of these rhetorical flourishes.

Not only do naive speakers implicitly recognize that a phrase is treated as if it were a lemma, they display an implicit recognition of several narrowly defined subtypes of the PAL construction, including *must* + VERB cases, and conventional uses of PALs as head nouns (*a simple* PAL^0; *the old* PAL^0 N) (Study 5). The current work provides an example of just how rich and complex our knowledge of language is.

Cross-linguistic observations (section 7) suggest comparable PAL constructions exist in Hebrew and Brazilian Portuguese, as well as in other Western Germanic languages and in Turkish. Further, the Hebrew and Brazilian Portuguese constructions are unrelated to compounds, thus suggesting that PALs need not conform to compounds. Future work is required to determine the extent to which the function is shared.

By investigating the function of the PAL construction in depth, we can see that its unusual syntax—a phrase appears where a root word normally would—provides an ideal means of doing what humans do so well: use finite means to depict ever-changing circumstances. We have argued that English speakers are implicitly aware of PALs' unusual syntax which, together with the complete picture of the distribution of PALs, makes any endeavor to assimilate PALs to a more familiar category such as a Noun or Adjective misguided. Ordinary language users merrily learn and make use of the complex properties of the construction, so it behooves linguists to recognize the rich complexity of language as well.

By indicating shared common knowledge with the listener, the PAL construction serves an affiliative function in addition to sharing content. Humor and sarcasm are also ways of affiliating with others, since, to paraphrase Grice's (1975) maxim of manner, we generally try to avoid overwhelming or boring our listeners. We hope we have not done so here.

Appendix

A.1. Preregistration for the first three studies, all items, data, and analyses for these surveys as well as the final survey on conventional subregularities (section 4.5) are available here: https://researchbox.org/3143&PEER_REVIEW_passcode=FLAFHF. The final study on conventional subtypes was preregistered separately: https://aspredicted.org/t2te7.pdf

AS PREDICTED

Wharton CREDIBILITY LAB
University of Pennsylvania

The function of the PAL construction (#142267)

Created: 08/30/2023 12:33 PM (PT)
Public: 06/03/2024 07:11 AM (PT)

Author(s)
Adele Goldberg (Princeton University) - adele@princeton.edu

1) Have any data been collected for this study already?
No, no data have been collected for this study yet.

2) What's the main question being asked or hypothesis being tested in this study?
The study investigates the Phrase as Lemma (PAL) construction in English:
H1: in comparison to semantically similar paraphrases w/o PALs, participants will be more likely to decide that the PAL-sentence implies a) more shared background with the listener/reader, b) is more witty, and c) is more sarcastic
H2: PAL phrases with higher log frequency as PALs, as determined by the COCA corpus, will decrease the overall bias toward PALs in each survey
H3: The bias toward choosing PALs will be, if anything, decreased when both options include use the same phrase as a quote.

3) Describe the key dependent variable(s) specifying how they will be measured.
The key dependent variable is choice in 2AFC tasks where PAL utterances are compared with close paraphrases that do not contain a PAL. The pairs of sentences have been normed separately on how semantically similar they are judged to be.

4) How many and which conditions will participants be assigned to?
2AFC tasks are between-participants: each participant will perform one 2AFC task on list that includes 10 target pairs + 12 fillers.

5) Specify exactly which analyses you will conduct to examine the main question/hypothesis.
We plan the following linear mixed effects model (see 8 for info about fixed effects)

lmer(PAL_choice ~ 1 + log_freq_PAL + paraphrase_quote + mean_similarity + pal_length + identical_phrase + (1|participant) + (1| item))

6) Describe exactly how outliers will be defined and handled, and your precise rule(s) for excluding observations.
Participants who fail either catch trial will be eliminated.

7) How many observations will be collected or what will determine sample size? No need to justify decision, but be precise about exactly how the number will be determined.
Each survey will be judged by 200 participants on the Prolific platform.

8) Anything else you would like to pre-register? (e.g., secondary analyses, variables collected for exploratory purposes, unusual analyses planned?)
*We have separately normed item-pairs for how similar in meaning they are judged to be. These means, as well as length of PALs (# of words), whether the PAL phrase is used verbatim in the paraphrase, whether the paraphrase includes a quote be included as fixed factors. Since Log_frequencies of the PAL phrases used as PALs correlates with the overall log_frequencies of the phrases. Our planned analyses include the former, but exploratory analyses will investigate whether overall phrase frequencies have any additional influence. We will also test correlations in bias toward choosing the PAL for items across surveys.

Table A.1: glmer outputs for each of the 3 main surveys, reported in section 3.4. Surveys asked which of two sentences 1) implies more common knowledge or b) shared background with the comprehender, 2) is more witty, or 3) or is more sarcastic. 99 sentence pairs used in each survey. $N = 685$. Bias toward choosing the PAL construction confirmed significant intercepts.

(1) PAL-sentences imply **more common knowledge (left)** and (b) **shared background (right)** with the comprehender than paraphrases

```
Random effects:
 Groups     Name        Variance Std.Dev.
 item       (Intercept) 0.1984   0.4454
 ResponseId (Intercept) 1.6435   1.2820
Number of obs: 927, groups:  item, 99; ResponseId, 94

Fixed effects:
                     Estimate Std. Error z value Pr(>|z|)
(Intercept)           1.69293    0.35243   4.804 1.56e-06 ***
mean_similarity      -0.01525    0.02002  -0.762 0.445984
paraphrase_is_quote1  1.06256    0.28175   3.771 0.000162 ***
log_freq_PAL          0.03249    0.11633   0.279 0.779988
identical.phrase     -0.08925    0.26512  -0.337 0.736391
pal_length           -0.08856    0.05169  -1.713 0.086694 .
---
Signif. codes:  0 ‘***’ 0.001 ‘**’ 0.01 ‘*’ 0.05 ‘.’ 0.1 ‘ ’ 1
```

```
Random effects:
 Groups    Name        Variance Std.Dev.
 Random.ID (Intercept) 2.0131   1.4188
 item      (Intercept) 0.9317   0.9652
Number of obs: 1944, groups:  Random.ID, 197; item, 99

Fixed effects:
                     Estimate Std. Error z value Pr(>|z|)
(Intercept)           1.77950    0.38498   4.622 3.79e-06 ***
mean_similarity       0.01209    0.02232   0.541   0.5882
paraphrase_is_quote1  0.60737    0.31177   1.948   0.0514 .
log_freq_PAL         -0.15662    0.13429  -1.166   0.2435
identical.phrase     -0.32313    0.30809  -1.049   0.2943
pal_length           -0.02241    0.06098  -0.367   0.7133
---
Signif. codes:  0 ‘***’ 0.001 ‘**’ 0.01 ‘*’ 0.05 ‘.’ 0.1 ‘ ’ 1
```

(2) PAL-sentences are **more witty**

```
Random effects:
 Groups    Name        Variance Std.Dev.
 Random.ID (Intercept) 1.3469   1.161
 item      (Intercept) 0.2851   0.534
Number of obs: 2019, groups:  Random.ID, 204; item, 99

Fixed effects:
                      Estimate Std. Error z value Pr(>|z|)
(Intercept)           2.5856474  0.3048595   8.481  < 2e-16 ***
mean_similarity      -0.0007994  0.0175463  -0.046 0.963662
paraphrase_is_quote1 -0.8488311  0.2356090  -3.603 0.000315 ***
log_freq_PAL         -0.1546969  0.1014781  -1.524 0.127400
identical.phrase     -0.0945570  0.2434409  -0.388 0.697706
pal_length           -0.0077907  0.0450873  -0.173 0.862815
```

(3) PAL-sentences are **more sarcastic**

```
Random effects:
 Groups    Name        Variance Std.Dev.
 Random.ID (Intercept) 0.5324   0.7297
 item      (Intercept) 0.3416   0.5844
Number of obs: 1875, groups:  Random.ID, 189; item, 99

Fixed effects:
                      Estimate Std. Error z value Pr(>|z|)
(Intercept)           2.709377   0.317138   8.543  < 2e-16 ***
mean_similarity       0.008446   0.017613   0.480  0.63154
paraphrase_is_quote1 -0.752782   0.247169  -3.046  0.00232 **
log_freq_PAL         -0.185818   0.107515  -1.728  0.08394 .
identical.phrase     -0.212123   0.257844  -0.823  0.41069
pal_length           -0.030222   0.047311  -0.639  0.52295
```

Appendix 2. Same surveys conducted with high-frequency PALs only

As described briefly in section 3.4, since we found no effect of (log) frequencies, we re-ran the same surveys using a single list that included all and only the 14 highest-frequency PALs.

Participants

75 new native English speakers were again recruited from the crowdsourced platform Prolific. After exclusions for incorrect responses to either catch trial, 70 participants remained (*Mean age* = 38.11). 17 participants were male, 47 were female, five were nonbinary and one preferred not to respond. As in surveys 1-3, we used the exclusion criteria supplied by Prolific to exclude participants who had taken part in any of the prior surveys or in more than one of the current studies, which again asked separate sets of participants which sentence indicated more common knowledge with the comprehender, was more witty, or was more sarcastic.

Procedure

The sentence pairs from the main surveys which involved the 14 most frequently occurring PALs in our data set, each with log frequency > 2 were judged by separate groups of participants in a single list along with the same 12 filler items used in other surveys and described in detail in Appendix 2. The 14 highest frequency items were*: must do, anything goes, do not disturb, must win, pay as you go, can do, wait and see, all you can eat, must read, know it all, trickle-down, must see, do it yourself.*

Results

As is evident in Figure A.1, even high frequency PALs were judged as implying more common knowledge and as being wittier and more sarcastic than their paraphrases.

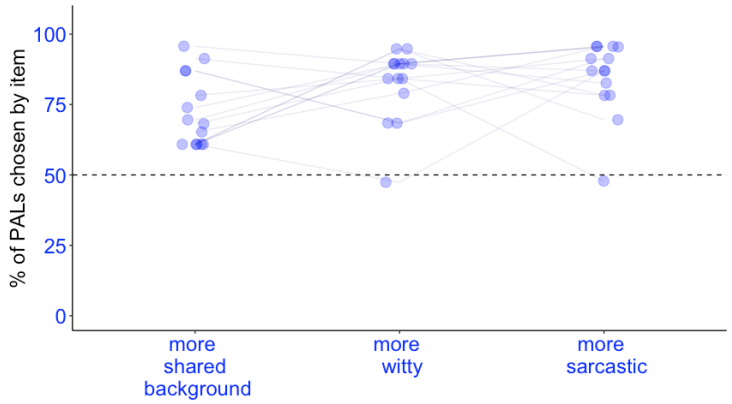


Figure A.1: Percentage of sentences containing high-frequency PALs chosen over close paraphrases as implying more common knowledge, being more witty and more sarcastic

The identical generalized linear models used to analyze the main surveys were applied except that subject intercepts were removed due to a lack of convergence on the common knowledge and wittiness surveys. PAL length and mean similarity ratings were centered to avoid collinearity. As before, intercepts show strong, significant bias toward selecting the PAL sentences as implying more common knowledge with the comprehender, and as being more witty, and as being more sarcastic than their close paraphrases. Additional smaller effects are evident, but we do not wish to over-interpret them due to the small number of items used.

Table A.2 For list of only high frequency PALs as items and close paraphrases.

More common knowledge

```
Random effects:
 Groups    Name        Variance  Std.Dev.
 Random.ID (Intercept) 9.152e-01 9.566e-01
 item      (Intercept) 5.187e-09 7.202e-05
Number of obs: 321, groups:  Random.ID, 23; item, 14

Fixed effects:
                     Estimate Std. Error z value Pr(>|z|)
(Intercept)          -3.79309    0.77697  -4.882 1.05e-06 ***
mean_similarity      -0.01756    0.03927  -0.447  0.65488
paraphrase_is_quote1  2.02327    0.64453   3.139  0.00169 **
mean_log_freq         0.22221    0.71110   0.312  0.75467
identical.phrase      0.69595    0.44170   1.576  0.11512
pal_length            0.49886    0.23539   2.119  0.03407 *
```

More witty

```
Random effects:
 Groups Name        Variance Std.Dev.
 item   (Intercept) 0.06625  0.2574
Number of obs: 322, groups:  item, 14

Fixed effects:
                     Estimate Std. Error z value Pr(>|z|)
(Intercept)           2.34862    0.67220   3.494 0.000476 ***
mean_similarity       0.04112    0.03361   1.223 0.221160
paraphrase_is_quote1 -1.00695    0.71103  -1.416 0.156722
mean_log_freq_PAL    -0.53358    0.66411  -0.803 0.421707
identical.phrase      0.95103    0.41224   2.307 0.021057 *
pal_length           -0.48045    0.23240  -2.067 0.038701 *
```

More sarcastic

```
Random effects:
 Groups    Name        Variance  Std.Dev.
 Random.ID (Intercept) 9.151e-01 9.566e-01
 item      (Intercept) 1.058e-09 3.253e-05
Number of obs: 321, groups:  Random.ID, 23; item, 14

Fixed effects:
                     Estimate Std. Error z value Pr(>|z|)
(Intercept)          -3.91138    0.77253  -5.063 4.13e-07 **
mean_similarity      -0.01755    0.03927  -0.447   0.6549
paraphrase_is_quote1  2.02319    0.64453   3.139   0.0017 **
mean_log_freq_PAL     0.22218    0.71110   0.312   0.7547
identical.phrase      0.69597    0.44171   1.576   0.1151
pal_length            0.49886    0.23539   2.119   0.0341 *
```

Appendix 3. Preregistration of conventional subtypes of PALs, Study #4

Preregistration at As.Predicted: https://aspredicted.org/t2te7.pdf

ASPREDICTED

Wharton CREDIBILITY LAB
UNIVERSITY of PENNSYLVANIA

Conventional subtypes of PALs (#145532)

Created: 10/01/2023 10:42 AM (PT)
Public: 06/03/2024 07:09 AM (PT)

Author(s)
Adele Goldberg (Princeton University) - adele@princeton.edu

1) Have any data been collected for this study already?
No, no data have been collected for this study yet.

2) What's the main question being asked or hypothesis being tested in this study?
Corpus searches indicate that certain subtypes of PALs recur more than others. This study aims to determine whether speakers are sensitive to the following: 1) a simple <PAL>; 2) the old <PAL>, 3) must-VERB, and 4) A: phrase. B: Don't "phrase" me. We hypothesize that relatively novel instances of each type of PAL will be judged more natural than minimally different PAL-tokens (e.g., a short <PAL>; the tired <PAL>; ought-to-VERB, A: <...> B: I heard you "<...>" me).

3) Describe the key dependent variable(s) specifying how they will be measured.
Participants are asked which of two PAL-sentences seems more natural. Choice is the dependent measure.

4) How many and which conditions will participants be assigned to?
Each person will see a single list of 4 items, including one instance of each type hypothesized to be conventional; the use of minimal list is aimed at avoiding priming or satiation effects. 10 unique lists (40 unique pairs, 10 items of each type, in total) will be distributed randomly participants. Both sentences in each pair contains a PAL. While the target phrase in each sentence is relatively novel in all examples, by hypothesis, it is an instance of a conventional subtype of PAL in only one sentence.

5) Specify exactly which analyses you will conduct to examine the main question/hypothesis.
We predict participants will recognize the conventional subtypes of PALs will be more natural, although both phrases are relatively novel in their specifics. The output is choice, and the intercept measures bias. The difference between conventional and non-conventional types of PALs differ in a single word in 3 out of 4 types. We therefore include as a fixed factor the difference in log frequency between the words used in the conventional item (i.e., must, simple, old) and in the non-conventional instances (e.g., ought-to, short, tired). Random intercepts for participants and items will be included:
glmer(Conventional_choice ~ 1 + log_freq_diff + (1|participant) + (1| item), binomial)

6) Describe exactly how outliers will be defined and handled, and your precise rule(s) for excluding observations.
Anyone who fails either catch trial will be excluded from analysis.

7) How many observations will be collected or what will determine sample size? No need to justify decision, but be precise about exactly how the number will be determined.
80 participants will be recruited on Prolific.

8) Anything else you would like to pre-register? (e.g., secondary analyses, variables collected for exploratory purposes, unusual analyses planned?)
Nothing else to pre-register.

Table A.3: preregistered model showing a bias to choose, as move natural, novel sentences hypothesized to include one of 4 conventional subtypes of PALs.

```
Random effects:
 Groups    Name        Variance Std.Dev.
 Random.ID (Intercept) 0.2384   0.4883
 item      (Intercept) 0.6428   0.8017
Number of obs: 295, groups:  Random.ID, 74; item, 40

Fixed effects:
             Estimate Std. Error z value Pr(>|z|)
(Intercept)     2.2797     0.3746   6.086 1.16e-09 ***
log_freq_diff  -0.3883     0.4003  -0.970    0.332
```

Exploratory analyses were also conducted on each subtype, hypothesized to be conventional. Each participant judged only one such item, so random intercepts for subjects are excluded in the models below (Tables A.4-A.7).

Table A.4: Generalized linear model for ten items that included "a simple <PAL>" in comparison to minimally different paraphrases: "a short/sweet/winning/basic/brief <PAL>".

```
Formula: PAL_choice_conv ~ 1 + log_freq_diff + (1 | item)
   Data: simple_PAL

REML criterion at convergence: 24.2

Scaled residuals:
    Min      1Q  Median      3Q     Max
-3.3510  0.1846  0.2218  0.3550  0.5280

Random effects:
 Groups   Name        Variance Std.Dev.
 item     (Intercept) 0.004547 0.06743
 Residual             0.072808 0.26983
Number of obs: 74, groups:  item, 10

Fixed effects:
             Estimate Std. Error       df t value Pr(>|t|)
(Intercept)    0.92574    0.05990  7.79374  15.455 3.99e-07 ***
log_freq_diff -0.02667    0.18561  7.94949  -0.144    0.889
```

Table A5. Generalized linear model for relatively novel *must*-VERB PALs in comparison to paraphrases in which *have-to, should, ought-to, can,* or *might* replace *must*

```
Formula: PAL_choice_conv ~ 1 + log_freq_diff + (1 | item)
   Data: must_verb

REML criterion at convergence: 14.6

Scaled residuals:
    Min      1Q  Median      3Q     Max
-3.7280  0.2191  0.2343  0.2610  0.4839

Random effects:
 Groups   Name        Variance Std.Dev.
 item     (Intercept) 0.002206 0.04697
 Residual             0.062844 0.25069
Number of obs: 74, groups:  item, 10

Fixed effects:
             Estimate Std. Error      df t value Pr(>|t|)
(Intercept)    0.93264    0.03280 7.48270  28.434 6.74e-09 ***
log_freq_diff  0.01760    0.05305 7.14112   0.332     0.75
---
```

Table A.6: Generalized linear model for ten items that included a direct quote from the immediately preceding context used as an interdiction as a transitive verb. Paraphrases varied in either being non-interdictions (5) or having similar meaning but not being direct quotes (5).

```
Formula: PAL_choice_conv ~ 1 + (1 | item)
   Data: quotedPAL_as_V

REML criterion at convergence: 73.2

Scaled residuals:
    Min      1Q  Median      3Q     Max
-2.2531  0.2474  0.4170  0.4453  0.9258

Random effects:
 Groups   Name        Variance Std.Dev.
 item     (Intercept) 0.01811  0.1346
 Residual             0.14026  0.3745
Number of obs: 73, groups:  item, 10

Fixed effects:
            Estimate Std. Error      df t value Pr(>|t|)
(Intercept)  0.81162    0.06119 9.40762   13.27 2.11e-07 ***
```

Table A.7. Generalized linear model for ten items that included *the old* <PAL> in comparison to minimally different paraphrases: *the tired/familiar/annoying/classic/big* <PAL>.

```
Formula: PAL_choice_conv ~ 1 + log_freq_diff + (1 | item)
   Data: old_PAL

REML criterion at convergence: 82.3

Scaled residuals:
    Min      1Q  Median      3Q     Max
-1.9792  0.4076  0.4714  0.5299  0.5560

Random effects:
 Groups   Name        Variance Std.Dev.
 item     (Intercept) 0.002941 0.05423
 Residual             0.163604 0.40448
Number of obs: 74, groups:  item, 10

Fixed effects:
             Estimate Std. Error       df t value Pr(>|t|)
(Intercept)    0.81079    0.09665  7.99617   8.389 3.11e-05 ***
log_freq_diff -0.01583    0.09408  8.03853  -0.168    0.871
---
```

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ENDNOTES

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[2] We recognize that what counts as a WORD is a complex issue, especially from a cross-linguistic perspective (Bickel and Zuñiga 2017; Dixon and Aikhenvald 2002; Haspelmath 2011; Lehmann 2008). An alternative to WORD here could be a LEX^{+} feature (Abeillé 2006:25; Sadler and Arnold 1994:187). However, we avoid evoking the notion of a LEXEME, where lexemes are items that are learned as units and accessed directly from memory because LEXEME is too broad for our purposes, since we take collocations, discontinuous phrases, and grammatical constructions to be lexemes in this sense.

[3] An anonymous reviewer suggested a paper by Finkbeiner and Meibauer (2016) which analyses another productive subcase in German, which also exists in English, in which a clause is inserted between first and last names as in the reviewer's example: "Donald 'I have the best words' Trump".

[4] As Reviewer 2 notes, a fuller description would be: [$_{NP}$ [$_{Det}$ a] [$_{N'}$ [$_{Adj}$ simple] [$_{N}$ PAL^{0}]]]. Also, *the old PAL N^{0}* could be more fully specified as [$_{NP}$ [$_{Det}$ the] [$_{N'}$ [$_{Adj}$ old] [$_{N'}$ PAL^{0} *N^{0}*]]]. We have simplified for the sake of readability.

[5] Paraphrasing de Saussure (2009 [1986]: 157), the form of the word *nineteen* is neither fully predictable nor arbitrary but is instead *motivated*. It is not predictable because English could have adopted a different base system for numbers, or an arbitrary term such as *nizzle* could have been used (cf. *eleven*). Yet *nineteen* is far from arbitrary, given the terms for 13-18.