

When novel sentences spoken or heard for the first time in the history of the universe are not enough¹: toward a dual-process model of language

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Abstract

Although interest in the language sciences was previously focused on newly created sentences, more recently much attention has turned to the importance of formulaic expressions in normal and disordered communication. Also referred to as formulaic expressions and made up of speech formulas, idioms, expletives, serial and memorized speech, slang, sayings, clichés, and conventional expressions, non-propositional language forms a large proportion of every speaker's competence, and may be differentially disturbed in neurological disorders. This review aims to examine non-propositional speech with respect to linguistic descriptions, psycholinguistic experiments, sociolinguistic studies, child language development, clinical language disorders, and neurological studies. Evidence from numerous sources reveals differentiated and specialized roles for novel and formulaic verbal functions, and suggests that generation of novel sentences and management of prefabricated expressions represent two legitimate and separable processes in language behaviour. A preliminary model of language behaviour that encompasses unitary and compositional properties and their integration in everyday language use is proposed. Integration and synchronizing of two disparate processes in language behaviour, formulaic and novel, characterizes normal communicative function and contributes to creativity in language. This dichotomy is supported by studies arising from other disciplines in neurology and psychology. Further studies are necessary to determine in what ways the various categories of formulaic expressions are related, and how these categories are processed by the brain. Better understanding of how non-propositional categories of speech are stored and processed in the brain can lead to better informed treatment strategies in language disorders.

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Introduction

The distinction between propositional and non-propositional speech was elaborated by Jackson (1874) well over a century ago. Definitions and categories vary, and much complexity has been uncovered in the years of study since Jackson's time, but an essential dichotomy between novel, newly created sentences and overlearned, formulaic, holistically processed expressions remains compelling. For some time, formulaic² expressions of all kinds were widely ignored as peripheral to human language, which, instead, was said to be characterized in its essential nature by the potential for infinite creativity represented by novel expressions (Chomsky 1957, 1965, 1997, Palmer 1971, Pinker 1995).

This dismissive perspective toward non-propositional speech, seen in scholarly as well as common thought, is reflected in the terms that have been used: 'automatic', 'uncreative' and 'emotional' (Goldstein 1948) or 'inferior speech' (Jackson 1874), 'nonintellectual speech' (Espir and Rose 1970) 'social chatter', and 'intrusive speech habits' (Mahl and Schulze 1964), ' clichés' or a 'lazy solution to linguistic selection' (Drew and Holt 1988; also Redfern 1989) constituting a 'very low level symbol' (Gloning *et al.* 1963). A *New Yorker Magazine* cartoon illustrates this denigrating attitude in the popular perspective: six tourists are looking out on the edge of a viewpoint; there is a sign identifying the spot as 'Inspiration Point' (Reilly 1978). The humour lies in the fact that despite their location, which is officially designated as inspiring, each person, as shown in the dialogue bubbles, is thinking a cliché, such as 'You're as young as you feel' (figure 1). Not only has public opinion looked down on fixed expressions, but also current linguistic models have strongly emphasized combinatorial creativity as the central property of human language (Van Lancker 2001a, b).

In some sectors of thought, especially in more recent years, the evaluative view of non-propositional speech has undergone radical revision. Many scholars of language recognize that numerous human verbal behaviours that do not fall into the category of newly created or novel language have important functions in everyday communication (Bolinger 1997, Harris 1998, Wray and Perkins 2000, Wray 2002). Rather than peripheral or ancillary in language processes, non-propositional (or formulaic) expressions are ubiquitous and crucial to successful communicative function, and competence in their use is required for effective, native-sounding communicative behaviour. The meaningful presence of a large variety of non-propositional speech in human language ability, and its importance in any complete model of language, is now more widely acknowledged (Sprenger 2003).

Major categories of non-propositional speech with an example from each are given in table 1. These and related utterance types can be presented for heuristic purposes across a continuum from 'propositional' to 'involuntary' (figure 2). This is one of many possible typologies. Nicolas (1995) distinguishes three types of word combination: free combinations, collocations, and idioms. In the continuum described here, free combinations are equated to 'novel expressions'. The term 'collocation' is often used to refer to common, recognizable word groupings that do not fit the categories of speech formula (used in conversation), idiom (lexical

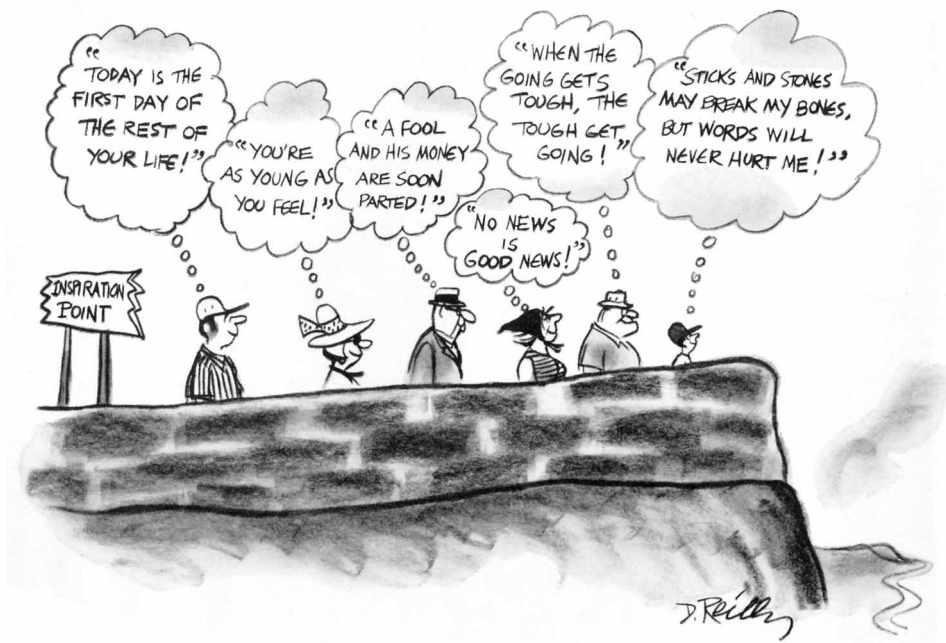


Figure 1. *New Yorker* cartoon. The ironic depiction in this cartoon of formulaic thoughts generated by visitors at ‘Inspiration Point’ reflects a common notion that such formulaic utterances are essentially uninspired. © The New Yorker Collection 1978 Donald Reilly from cartoonbank.com. All rights reserved.

items used nonliterally) or proverb (expression pointing to a general meaning). Sprenger (2003) uses the term ‘restricted collocations’ (p.110) and observes that these items are distinguished by their ‘unitary character’ (p.111). Examples are ‘unforgettable experience’, ‘fast asleep’, ‘grievous injury’, ‘a sharp turn’, ‘hook, line and sinker’, ‘red, white and blue’. Similarly, Harris (1998) refers to two types of ‘entrenched constructions’: idioms (‘Great minds think alike’) and common word constructions (‘last chance’) or collocations (p.56).

Table 1. Non-propositional categories with an example of each

Clichés: The pursuit of happiness
Conventional expressions: Pleased to meet you
Expletives: Son of a gun
Familiar proper nouns: George W. Bush
Indirect requests: It’s getting late
Memorized expressions, i.e. prayers, lyrics, song titles
Pause fillers: So, well, like, ya’ know
Proverbs: Rome wasn’t built in a day
Sentence stems: I’d like you to meet ...
Serial speech, i.e. numbers, alphabet, days of the week
Slang: Grody to the max
Speech formulas: How are you?

Continuum of nonpropositional speech

PROPERTIES

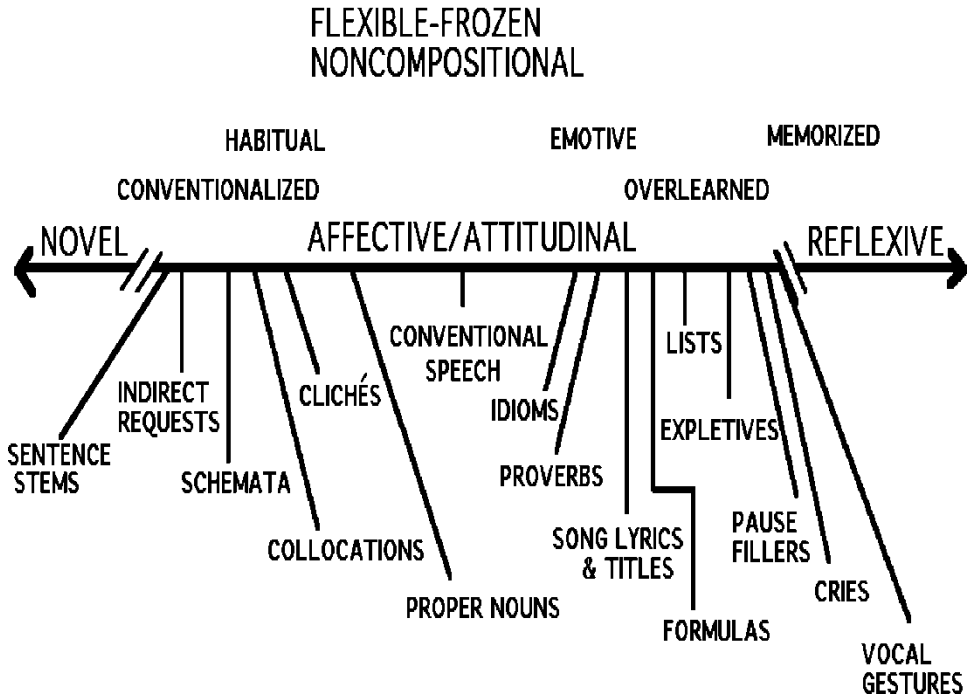


Figure 2. Proposition-non-propositional continuum. This schema offers a non-exhaustive, heuristically presented overview of selected categories and properties of formulaic utterances and possible relations between them. Questions remain about how the categories differ or group together, and whether or not transition at the endpoints (reflexive and novel expression) is continuous.

In the formulation provided in figure 2, an important question is how do the utterance types differ from each other—the details have not yet been adequately explored. A conclusion that flows with some certainty from a century of observations is that, as viewed in several domains of study, non-propositional speech differs in important ways from newly created language. Areas of study to be reviewed in this review are linguistic properties, psycholinguistic processing, sociolinguistic investigation of language use, observations of normal language development in children, and clinical and experimental evidence from brain processing of propositional and non-propositional language.

Linguistic studies of non-propositional language

Despite the hegemony of formal syntactic studies in the second half of the 20th century (Van Lancker 2001a, b), some linguistic scholars have recognized the

importance of nonnovel expressions (Jespersen 1933:18). Fillmore (1979) argued that ordinary usage of speech formulas was important for native competence. Others have included sentence stems (I'd like you to meet ...) in the set of fixed expressions that are essential to daily communication (Pawley and Syder 1983, Pawley 1985, 1991). Various other formulaic expressions have been identified in the linguistic literature as worthy of description. These include idioms, slang, sayings, expletives, clichés, maxims, slogans, and proverbs (de Saussure 1968, Makkai 1972, Coulmas 1981, 1994, Norrick 1985, Wray and Perkins 2000), called *locutions toutes faites* by de Saussure, 'ready-made utterances' by Lyons (1968), 'idiomatic composite forms' by Hockett (1958), and habitual collocations by Firth (1968).

Another type of conventional expression, indirect speech, also cannot be usefully described according to ordinary grammatical principles (Lakoff 1973, Searle 1975). 'Would you pass the salt?', although interrogatory in form, is not intended as a question but as a request, and to answer merely with the word 'no' (meaning, 'no, I would not pass the salt') or 'yes' (meaning, 'yes, I would pass the salt'), without any accompanying action, derails ordinary communication; an indirect request is a performative utterance, meaning that the correct response is the action of handing over the salt shaker. Similarly, 'do you know what time it is' is an indirect request for information about the time of day. To respond, 'Yes, I do', without further comment, misses the point. Compare 'Would you like to take a ride in the car?', which is intended as an information question, and to which either a 'yes' or 'no' verbal response is appropriate.

For Langacker (1987), structures that become well entrenched or routinized may be processed holistically. Similarly, idioms and proverbs cannot be described simply as lexical items combined by grammatical rules, and attempts to model them using this basic approach have met with mixed success (Chafe 1968, Weinreich 1969, Fraser 1970, Katz 1973, Nunberg *et al.* 1994).

Five properties of non-propositional speech

The two modes of language, compositional-propositional and holistic-non-propositional, each have different properties and perform a different communicative function. Formulaic utterances have many characteristics that do not naturally inhere in novel expressions. Five important properties are stereotyped form (or cohesion), conventionalized meaning, association with social context, inclusion of attitudinal and affective valence, and familiarity-recognition by native speakers.

Stereotyped form means that the words and the intonation contour have a specified, determined shape. This is the strongest version of phrasal 'cohesion'. Formulaic expressions have the property of noncompositionality, in that they cannot be accurately depicted as a combination of words assembled by grammatical rules. However, the stereotyped or canonical forms can be operated on by grammatical rules. Although an idiom cannot undergo lexical substitution and fully retain its original, well-formed identity, playful alterations are common, while retaining the recognizability of the original form. Attempts to recast non-propositional expressions draw attention and are often humorous, such as 'male cadavers are incapable of any testimony', and 'avian creatures of similar appearance congregate' or the more daring 'rolling stones gather momentum'.³ In the screenplay *Some Like It Hot*, Jerry alludes to a common idiom by saying and 'Well, pull in your

reel... You're barking up the wrong fish' (Wilder and Diamond 1959). The reader can easily note the ubiquity of this practice in daily language use.

Literal usage of idioms for effect is common in newspapers and advertisement. A story about compressing coal and tar to form logs used the header (formulaic expression is underscored) 'Logs like these don't grow on trees', while a travel advertisement stated 'come in and we'll tell you where to go'. 'People can lie through their teeth but their teeth can't lie' was said by a forensic authority on teeth marks as evidence in court; 'Go fly a kite in a city context' advertised a civic event, alongside ads for real estate on planets other than earth: 'California firm has deal that's out of this world'. Lexical items were emended in a recipe for duck, entitled 'cooking the goose's cousin', while instructions on how to make tempura called to the reader by changing one word in a familiar expression: '[Try] Fry it, you'll like it'. A negative review of a movie about combat made its point by alluding to while altering a known formula: 'war is heck' (from 'war is hell').⁴

A sign of the known, stereotyped, noncompositional shape of formulaic expressions is the presence of archaic words as in 'nick of time', 'pledge my troth', 'cut the mustard', and odd grammatical forms as in 'don't take it so hard' (non-standard use of adjective as adverb), 'trip the light fantastic', 'believe you me', 'come hell or high water', 'from here to kingdom come', and 'fancy meeting you here'. Thus while formulaic expressions have a canonical shape (or stereotyped form) known to the native speaker, these forms can be and frequently are manipulated.

The second property of non-propositional expressions is conventionalized meaning. This is famously true of idioms, for which the meanings cannot predictably be derived from the lexical items and their grammatical arrangement. Many speech formulas also incorporate a nonliteral element: 'My hands are tied', 'You bet your boots', 'I'm on cloud nine'. But many formulaic utterances are not strictly nonliteral in the same sense of idioms, and yet they carry a penumbra of special connotations beyond their lexical meanings. Examples of this are innumerable: 'Hot enough for you?', 'That's the best I can do', 'Give it the old college try',⁵ 'Give it the old one-two', 'I'll believe it when I see it', 'It just isn't me', 'It's all good'. According to Harris' (1998) formulation, these types of constructions map onto unified cognitive structures which bundle information. The special meaning of most non-propositional utterances must be known and learned as a whole with the utterance (Keysar and Bly 1999). The other properties described below—context dependence, affective content, and familiarity—contribute to the special semantics of formulaic expressions.

As a characteristic of the conventionalized, complex meanings which are known to the native speaker, formulaic expressions typically have a capacity for indirect expression, allowing an avoidance of the specification of the details of the situation (e.g., 'You've flipped your wig', 'It takes one to know one', 'You can both take a flying leap', 'Once in a blue moon'). Of course, indirect and nuanced comments can be made propositionally (using novel sentences). But this is done by adding and selecting words, and drawing from a broad range of intonational cues. In contrast, formulaic expressions, by definition, are prepackaged, and contribute their effect all at once. It follows that a propositional expression usually takes longer to say (than the same 'idea' expressed in a formulaic utterance) and involves more computational work both to say and to understand. For 'She has him eating out of her hand', a corresponding (yet inadequate) novel expression might be 'A female has set up a relational interaction with a male such that he dotes on her and caters

to her willingly'. While the same overall communicative force can be achieved by saying 'I just now experienced sudden and unexpected extreme physical discomfort' rather than emitting an expletive on stubbing one's toe, something, as we say, is lost (and gained) in the translation.

As a third property, these meanings are more closely tied to social and cultural context than are the meanings of propositional utterances (Coulmas 1979, Kecskés 2000). ('You want to make a Federal case out of it?', 'We'll hate ourselves in the morning?'). Speech formulas, such as greetings, leave taking, and conversational-interaction expressions, are especially associated with social context, and idioms and other conventional expressions are also often crucially tied to social and contextual cues (Kecskés 2000). The huge repertory of politicized slogans—'All power to the people', 'Make love not war'—provide the most obvious examples. Identification with social groups is signalled by a repertory of non-propositional expressions, which have distinct geographic, age, gender, dialectal, ethnic, class, and occupational varieties. Families, couples, employment groups, sociological entities, sports clubs, and social groups of all kinds (Pawley 1991) form their unique repertory of slang, jargon, sayings, and idiomatic usage, allowing for special processes of bonding and solidarity, verbal play, and humour. Here the natural, intrinsic attitudinal and emotional content of non-propositional utterances (see below) can play a special communicative role (Long 1994, Fussell and Moss 1998). At the discourse level, formulaic structure is present in specific settings, such as weather forecasting: expressions present in each forecast include 'a ridge of high pressure', 'a (shallow) trough of low pressure', 'a slow moving front' (Hickey and Kuiper 2000), and auctions: 'I have x dollar bid', 'I have x dollars' (Kuiper 2000). In professional settings of all kinds, this capability provides standardization of concepts and routinization of the process of communicating them. From a sociolinguistic perspective, it has been suggested that formulas are better specified semantically using notions of frames and scripts (Baranov and Dobrovolskij 1996). Rather than composed of a group of assembled meanings (as is described for novel expressions), non-propositional utterances map onto integrated meaning complexes, social nodes, or scenarios, or are more closely tied to conceptual units (Keysar and Bly 1999).

The social role of formulaic language has a range of purviews from international to interpersonal. Idioms and formulas function as affiliative responses in communication, drawing on 'taken-for-granted knowledge shared by all competent members of the culture' (Kitzinger 2000: 121). Speakers wishing to 'fit in' with any of these social groups acquire context-appropriate expressions and then must follow often rapid changes. Specialized non-propositional utterances are featured in sports, subtypes of sports, fans, occupational groups, fashion trends, and countless other gatherings. Couples rating high marital satisfaction also reported a higher use of idioms in their communication than less happy couples (Bruess and Pearson 1993). In surveys examining the use of idioms in friends' relational cultures, a large number of idioms was reported as a major component of communication with a close friend (Bell and Healey 1992) and between members of romantic couples (Bell *et al.* 1987).

Doubtless due to their strong interaction with cultural settings, non-propositional forms are subject to processes of diachronic change different from those undergone by syntactic structures: note the relatively abrupt turnover of slang, slogans, greetings, often reflective of social trends (Eble 1990). Changes in

slang in a college population has been documented since 1989 by P. Munro and her students at UCLA (Munro 1997, Ali *et al.* 1993). Russian slogans seen on billboards changed radically in the years following the collapse of the Soviet regime. In his history of the Third Reich, Kershaw (2000) documented that by September 1944, when expressed civic loyalty to the totalitarian regime was finally disintegrating, 'the German greeting, 'Heil Hitler', was increasingly replaced by 'Good morning'; 'Good day', or, in south Germany, "Grüß Gott" (p. 703). Given the reality of the police state, where one's life could literally depend on the most trivial of public acts, this perceived shift in common greetings was salient enough to be entered in a diary of the time (Breloer 1984).

Fourth (and related to other unique semantic properties described above), non-propositional utterances (with some excepted subsets)⁶ naturally contain emotional or attitudinal content (Čermák 1994). While novel sentences require intonation and/or selected adjectives, adverbs or nouns with connotative meanings to communicate affective or attitudinal valence, non-propositional expressions carry such information as part of the conventionalized meaning. For example, the proposition 'She is eating with her right hand' is neutral with respect to evaluative judgment, while the idiom 'she has him eating out of her hand' incorporates a complex set of innuendoes. The novel expression 'the cat is on the couch' requires adjectives or highlighted intonation to communicate disapproval, enjoyment, or any value judgment, but is otherwise neutral; the proverb 'while the cat's away, the mice will play' signals, as part of its meaning, an array of attitudes, values, and affect: fun, relief, defiance, risk, annoyance. Typical of non-propositional expressions are nuance and innuendo built into their meanings (e.g., 'I ought to wring her neck', 'I met someone', 'He's not the man he used to be', 'More millionaires than you can shake a stick at', 'Your place or mine', 'I've been on the wagon', 'Looks like they're on the wrong track', 'Nothing up my sleeve', 'You're a real pal', 'You can't be serious!', 'They're onto us').

Finally, formulaic expressions are special because people know them. Speakers recognize these expressions as familiar; they have the 'cohesive, unitized feel' of words (Harris 1998: 56). People do not know novel sentences, by definition, because they are new. It is easy to elicit understanding of the different competences underlying established idioms and matched novel expressions (Vanlancker-Sidtis 2003, Vanlancker-Sidtis and Rallon 2003). People easily and routinely register familiarity with a very large number and range of non-propositional expressions. An incomplete portion of a formulaic utterance suffices to cue the entire expression. In conversation, it is speakers' mutual knowledge of these expressions that fosters use of known utterances. Allusions to non-propositional expressions, by invocation of a piece of the phrase, serve to bring a conventionalized meaning into the discussion. Examples actually heard in conversation are 'Besides the small world thing', which alludes to the complex meaning of a formula signalling a chance meeting of acquaintances, and 'If you're into burning bridges', alluding to a proverb about abandoning previous relations. Parts of idioms can be used to similar effect: a newspaper article referred to a 'parodist with just the right length of tongue in his cheek'. In these practices, favoured innuendoes can be employed, the indirectness of the message can be exploited, and affinity can be communicated using reciprocally known formulaic language.

Knowledge in a language community of a very large number of non-propositional expressions is ubiquitously demonstrated. In some of his novels, P. G. Wodehouse

provides only initial letters for words in formulaic expressions used for the first and only time (e.g., ‘to cut a long story s’. 2000: 39) assuming knowledge in the reader, and establishing closer intimacy with the reader by signalling this mutual knowledge. As mentioned above, headlines in daily newspapers routinely play on known non-propositional utterances, again, assuming knowledge in the reader, and presumably hoping to catch the eye of a potential buyer by allusion to a known expression. Bylines from any newspaper mirror these examples from the *Chicago Tribute* (1979): ‘Now a drinking problem can really run its course’ (a story about running as a remedy for alcoholism); ‘Underground: can you dig it?’ (caption for a picture of an underground home); ‘Aw, [shoot] chute’ (picture of child playing with a parachute caught in trees); ‘Everything the [heart] hearth desires’ (advertisement for a fireplace shop); ‘Wait and see what develops’ (story byline of a photography display); ‘We’ll curl up and dye for you’ (men’s hair styling ad); ‘[pause] Paws for comment’ (advertisement for china cats). These frequent tropes (playing with a familiar expression) are effective precisely because the canonical form is known and recognized by native speakers.

Perusal of *New Yorker Magazine* cartoons over any period reveals that approximately one-third to one-half of jokes utilize this same trope. The cartoons depict an idiom, proverb, speech formula, expletive, saying, or other non-propositional expression, sure to be known to the public, in a context inappropriate to that expression in some specific way, or with minor lexical or intonational alterations (often signalled by bolding, italics, or underscore). Inappropriate context may be a wrong stylistic register, or a drawing that forces a literal interpretation, or the expression may be attributed to an inappropriate speaker. Alterations in the stereotyped form of the familiar utterance alone may trigger the humour. A few examples selected and verbally interpreted from the *New Yorker Magazine* (figure 3) show that speakers have a great deal of insight into how formulaic language functions in communication. The cartoons appeal to specific principles in the language users’ knowledge, which yields the humorous effect. In the exemplary cartoons described in figure 3, speakers must know that (1) many formulaic expressions have a specific origin, (2) an individual’s repertory of speech formulas changes over the years, (3) formulaic language has sensitive contextual contingencies, and (4) sayings carry rich social and political connotations, (5–11) formulaic expressions are usually used nonliterally, while the literal meaning is unlikely and/or odd, and (12–13) formulaic expressions have stereotyped form and meaning, such that deviations are striking.

Second language speakers

Studies of second language learning have noted the special problems that formulaic expressions pose for second language speakers (Weinert 1995, Wray 1999a, b, Vanlancker-Sidtis 2003). Given the special properties of formulaic language described above, it is not surprising that mastering this component of language presents very different challenges from learning to produce novel sentences (Alexander 1978). The second language speaker may err in the precise form of the non-propositional expression, or in apprehension of its complex, conventional meaning, which includes nuances as mentioned above, or in appropriate usage with respect to linguistic or social context.

Part of the challenge for the second language speaker lies in the ‘complexity of the

1. Two older male professors walking across a college campus. One professor to the other: "You're in cultural anthropology, Williams. Who was it who said "Thank heaven for little girls?"	Tod Fisher
2. Affluent couple in upscale car: Woman to man: "Jonathan, when did you start saying "Mark my words?"	Saxon
3. Stage of a classical concert with full orchestra, conductor, and violin soloist, with first few rows of audience visible: Soloist to audience: "Thank you, folks, thank you. And now I'd like to dedicate this next number to all my wonderful fans out there who have been so good to me over the years. It's a favorite of mine, goes by the name of Beethoven's Violin Concerto in D Major, and it sounds something like this."	Stevenson
4. sunglasses, and an afro hair style. Wife to black party-goer: "Hi! All the power to the people, right?"	Handeltman
5. Sitting room of farm house, wife knitting in chair, husband standing at door in bib-overalls, holding bucket. Husband: "Something tells me not to, but I'm going out to count the chickens before they hatch."	cartoonist
6. Two executives holding briefcases, one sitting on ground with contents of briefcase strewn beside him, looking up: Executive on ground to standing executive: "So, Ayers, push has come to shove."	cartoonist
7. Two armored knights on horseback, castle in background, viewing a couple in a copse, consisting of a damsel in a long dress and a fully armored person: One horseback rider to the other: "So <u>that's</u> her knight in shining armor."	Modell
8. Two older males wearing coats, walking side by side, one with a man's brimmed hat and the other with a plaid cap with a brim on front and back. The man with the plaid hat: "Sometimes I don't know if I'm coming or going."	Minter
9. Dentist peering down into the mouth of a patient in the chair. Dentist to patient: "Hmm. Been biting the old bullet again. Eh, Mr Hedelby?"	Bud Fisher
10. An older couple sitting in a wintry outdoors on a park bench: man is holding an umbrella-like apparatus that is a stick attached to a small tiled, pitched roof that just covers the two of them. Man: "So we've always had a roof over our heads. Big deal!"	Wammer
11. Two birds sitting on the branch of a tree. Bird to other bird: "How do I know? How the hell do you think I know? A little birdie told me. That's how I know."	Hegis
12. Burly male with beer in hand at a bar addressing another man wearing a tie: Burly man to other bar patron: "Try and stop me if you've heard this one."	Bernard Schoenbaum
13. King wearing crown has just opened a gift, and is looking enthusiastically into the box: King: "Why, this is fit for me!"	Barsotti

Figure 3. Cartoon examples. These are verbal descriptions of cartoons selected from the *New Yorker*. A large proportion of the cartoons in this and other popular publications use various properties of formulaic expressions for humorous effect, implicitly assuming knowledge of these properties by the average reader.

cultural information which is coded in formulae’ (Kuiper and Tan Gek Lin 1989:304). For example, cultural meanings of expletives in a second language may not achieve the intensity of a first language expression: second language speakers frequently report that they can use these expressions with greater ease in their acquired language. These anecdotal reports were corroborated by a recent study showing greater autonomic reactivity, using skin conductance measures, for taboo words and formulaic reprimands (‘shame on you!’) (Harris *et al.* 2002). The complex cultural context, as part of the conventional meaning of the formulaic expression, as well as the stereotyped form, are as difficult for the adult second language learner as are prosody and articulation. Idioms as ‘culturally saturated symbols’ may cause communication difficulties between people of different cultural backgrounds (Lee 1994). Thus it can be assumed that the conventional meanings, including the appropriate social context of formulaic expressions, are also sometimes misconstrued by non-native speakers, using a jarringly informal expression in a relatively formal linguistic or social context.

Acquisition of the native-sounding forms in second language learning is often only approximate. While approximations may work well for novel sentences, missing the mark on a formulaic expression is salient. Second language speakers report avoiding speech formulas and idioms in their daily speech, because of their uncertainty in using these expressions (A. Cutler, personal communication, 2003). For those who attempt using formulaic expressions, ‘errors’ occur, in the sense that a known expression was only approximated. A few examples follow: a native speaker of German said ‘blind spot’, accenting the second syllable, although the accent is normally on the first syllable; another said, ‘I wouldn’t want to be in his shoes like that’, where again the accent is misplaced and, in addition, extra words appear. A speaker of Hebrew said ‘on the other fence’, presumably mixing two idioms (on the fence and on the other hand), and a Scandinavian speaker often said ‘Thanks God’. (For a list of see recorded formulaic ‘errors’ by non-native speakers, see table 2).

Native speakers also make ‘errors’, utilizing non-propositional expressions in ways as to arouse attention, intentionally or unintentionally. Some speakers, such as Dan Quail from Indiana, earn a reputation for mangling non-propositional expressions, in a manner similar to Professor Spooner, who made anticipatory phonological errors so frequently that the practice took on his name. Of course, Spoonerisms refer to phonological exchanges in propositional expressions, and the anomalies heard from native speakers attempting a formulaic expression have a different quality. The formulaic expression may be distorted, incomplete, or

Table 2. Examples of second language errors

1. On the other fence	Germanic language
2. It really didn’t sink	Israeli
3. Thanks God	Scandinavian
Q: Do we know anything about ...	
4. A: No, not off my head, no	Danish/Dutch
5. I got into their goat. Every time something happens here, I get into their goat	Philippina
6. We have risen up to the occasion	Israeli, radio interview
7. They are selling like little cakes	Belgian
8. I wouldn’t want to be in his SHOES like that	German
9. Get the get out of here	Lithuanian
10. I don’t know how much water that holds	Indian (India)

conflated with another formulaic expression. Some recorded examples of formulaic speech anomalies from native speakers are ‘I’m going to beat it like a dead horse’ (from ‘it’s no use beating a dead horse’), ‘They look like night and day’ (from ‘it’s as different as night and day’), and ‘I don’t think there should be a fig of a problem with that’ (from ‘I don’t care a fig about that’). Further studies of these deviant productions would be of great interest. It remains to be considered whether these speakers have pragmatic deficits, because not enough is known yet about normal incidence of formulaic language in everyday usage.

Psycholinguistic evidence for the special status of non-propositional language

Evidence for stereotyped form as a characteristic property of non-propositional expressions comes from several sources. A earlier study (Van Lancker *et al.* 1981) examined utterances that are ditropically ambiguous: These are expressions that can have either a literal or an idiomatic meaning, such as ‘I hit the sack’ and ‘It broke the ice’. Native listeners were able to distinguish the literal- from the idiomatic-intended meanings by auditory/acoustic information alone, as provided by context-free tape recordings. Acoustic analysis revealed that a greater number of local pitch contours and pauses, as well as greater overall length, was associated with literal meanings when compared with the same utterance-types spoken with an idiomatic meaning (figure 4). Similarly, psycholinguistic studies by Goldman-Eisler (1968) suggest that pauses are

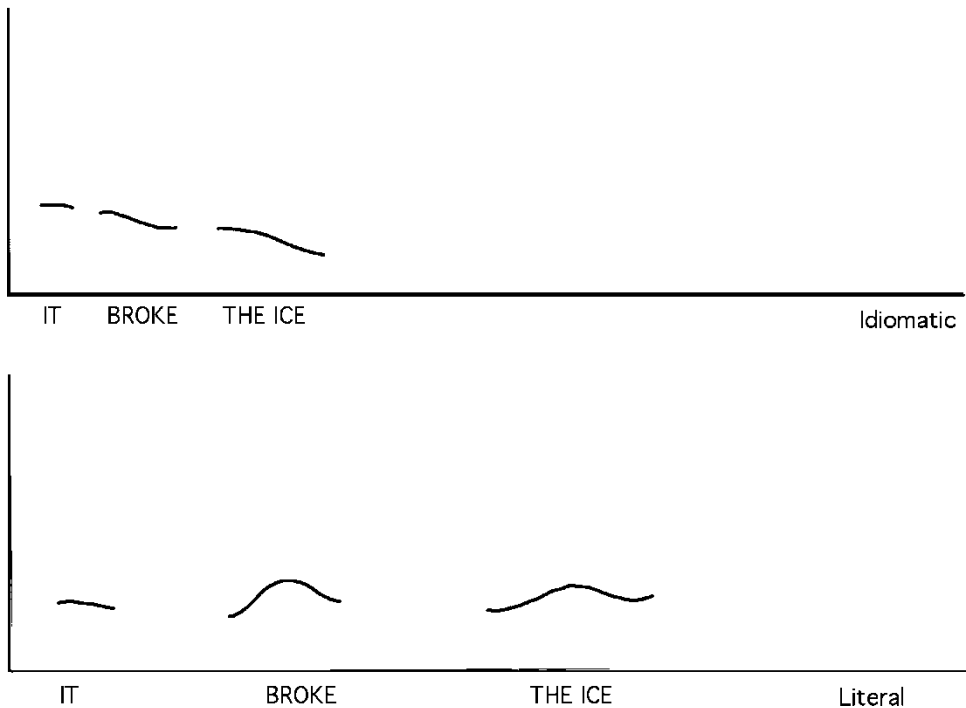


Figure 4. Idiom/literal contours. Acoustic analyses of ‘ditropic sentences’ produced with either a literal or an idiomatic intended meaning revealed significant differences in overall duration and in numbers of pitch contours and pauses. These acoustic cues were sufficient to distinguish the intended meanings for listeners (Van Lancker *et al.* 1981).

less likely in automatic or formulaic constructions than in propositional expressions. Lieberman (1963) also reported acoustic differences between literal and idiomatic phrases; speakers produced a (target) word differently in nonliteral contexts such as ‘A stitch in time saves nine’ compared with literal exemplars such as ‘The number I will say is nine’, with predictably increased intelligibility in listeners’ judgements for words excised from the literal utterance. These results suggest that prosodic cues characterizing idiomatic expressions form part of a native speaker’s competence. A later study showed that proficient second language speakers performed significantly worse than native speakers on the ditropically ambiguous utterances when required to use prosodic cues alone to distinguish idiomatic from literal meanings (Van Lancker-Sidtis 2003).

It is likely that in addition to stereotyped intonation contour, the characteristics of rhyme, alliteration and rhythm so frequently seen in fixed expressions (e.g., ‘bell, book and candle’, ‘it takes one to know one’, ‘the coast is clear’, ‘the best laid plans of mice and men’) help speakers to learn and maintain non-propositional expressions (Alexander 1978). Phonological and semantic factors that may underlie speakers’ knowledge of some fixed expressions have been examined (Cooper and Ross 1975, Pinker and Birdsong 1979), resulting in some proposed patterns in sound and meaning.

Being relatively fixed in form and meaning, formulaic expressions, from the point of view of grammatical description, have the property of ‘noncompositionality’. Survey and priming studies suggest that the cohesiveness of unitary expressions is known and recognized by speakers (Harris 1998, Šipoš 1984, Vanlancker-Sidtis and Rallon 2003). Psychological studies indicate that idioms and formulas are remembered as chunks, not as composite forms (Horowitz and Manelis 1973, Osgood and Housain 1974, Simon 1974, Pickens and Pollio 1979). According to Titone and Connine (1994), ‘[linguistic] models in which meaning is derived from the compositional analysis of a linguistic input cannot account for the comprehension of idioms’ (p. 1126). An early approach to idioms was to consider them as lexical items, leading to the lexical representation model. This view was supported by psycholinguistic studies requiring visual classification judgements: responses were faster on idioms than on matched novel or nonsense expressions (Swinney and Cutler 1979, Estill and Kemper 1982, Schweigert 1986). In this model, idiomatic meanings were directly accessed in language processing (Bobrow and Bell 1973, Gibbs 1980, Hoffman and Kemper 1987, Botelho da Silva and Cutler 1993), and idioms were to be considered as phrasal lexical items.

As research progressed, many kinds of flexibility were observed in certain idioms and in other non-propositional expressions (Gibbs and Gonzales 1985, Reagan 1987, Gibbs *et al.* 1989a, Gibbs and O’Brien 1990, Glucksberg 1991). Although most recent perspectives continue to point away from the notion that listeners first attempt a literal interpretation (Peterson *et al.* 2001), it can indeed be shown that literal meanings play a role in processing (Hamblin and Gibbs 1999).

There is no question that formulaic expressions occur in altered forms. In examining expressions ‘usually regarded as completely frozen’, Nicolas (1995) discovered that ‘at least 90% of V-NP idioms ... appear to allow some form of (syntactically) internal modification’ (p. 233). Cutler (1982) showed that the putative frozenness parameter may actually reflect the age of the expression, perhaps accounting in part for the range of grammatical judgements on these expressions. Even the simplest speech formula—‘Have a nice day’—can appear as ‘Have a really nice day’ or ‘Have a great day’ or ‘You have a nice day now’. The variety of shapes formulas may assume is exemplified by the telephonic greeting from the fictional

character Bertie Wooster to his aristocratic aunt: ‘A very hearty pip-pip to you, old ancestor’ (Wodehouse 2000). The claims that some formulaic phrases cannot undergo change are difficult to substantiate.

The most putatively resistant example cited in the literature is the idiom ‘kick the bucket’ (with the meaning of *die*), which, according to many writers, cannot occur in a passivized form (Gibbs *et al.* 1989b, Nunberg *et al.* 1994, Van de Voort and Vonk 1995). But it can. Imagine a macabre scenario in which passers-by view a field of farm animal corpses. Someone says, ‘The bucket was certainly kicked here’ with successful communication. A physician can refer critically to an unsuccessful colleague as a ‘bucket-kicker’, and be understood, exploiting the innuendo present in the source idiom. Morphogrammatical rules available for the generation of novel sentences, such as pronoun substitution, tense changes, adverb and adjective insertion, nominalization and passivization can apply to any fixed expression, if it works in the communicative moment. The point is that novel changes are, in these cases, applied to the known, formulaic utterance, so that ‘the best of both worlds’ is available for communication: the fixed expression with all its connotations, and a new twist on that expression.

Other studies revealed that idioms vary in the plausibility of their lexical meanings (Popiel and McRae 1988), and that degree of compositionality is related to opacity or transparency of lexical meanings in formulaic expressions. Under certain conditions, words in the idiom or proverb contribute metaphorically to the nonliteral meaning (Glucksberg 2001). A typical example occurred in a *New York Times* newspaper article, quoting a former federal prosecutor on the recent Enron/Arthur Andersen scandal: ‘Where there’s smoke there’s fire, and where there is a lot of smoke, like the destruction of documents, there is a lot of fire. This is really beginning to look like a fraud scenario’ (Mitchell 2002). Of course, no native speaker of English would conclude that the prosecutor was referring to smoke or fire, not only because all the destruction was in the form of paper shredding, but also because the utterance is understood with its formulaic, nonliteral meaning; it is intended, rather, to suggest evidence and problems of some kind, and the intensifier ‘a lot’ is used to enhance the point and to characterize the role of ‘the destruction of documents’. Words in speech formulas more often contribute directly to the meaning, as in ‘Will it ever end’, but strictly speaking, the meaning is still conventionalized and is not completely specified by the words. Proverbs such as ‘Don’t count your chickens before they hatch’, are famous for having two levels of meaning, one that reflects literal semantics, and a second alluding to a universal meaning.

For idioms, rather than considering the composite words of an expression as not contributing to the overall meaning, a role of the lexical items in the expressions’ meanings has been actively investigated. It has been concluded that lexical items in idioms, in some cases, do contribute via something of their literal meaning. Consider the expression ‘She was out on a limb’. On closer examination, the meaning is only quasi-conventional. It is possible to say ‘She was really out on a limb’ or ‘Her mother and she were both way out on a limb with that idea’, whereby the semantics of the word ‘limb’, while still not literally applied, does give metaphoric force to the meaning of the expression. Thus, the term ‘compositionality’ refers to the degree to which individual word meanings of an idiom contribute to the idiomatic interpretation (Gibbs *et al.* 1989b, Titone and Connine 1999). For some idioms, individual words appear to play a role in the overall meaning more than for others, as in ‘She was way out on a long, shaky limb’. Here, too, and related to this

notion of compositionality, the expression is only relatively fixed, because many variations are possible while still retaining the identity of the expression. Speakers' assumptions about the how the meanings of idiom parts contribute to idiom meaning is said to predict the syntactic productivity of an idiom, but results differ depending on how idiom tasks are designed (Cacciari and Tabossi 1988).

Thus, through an array of psycholinguistic experiments using various methods,⁷ a proliferation of classifications has been proposed and explored. Expressions have been said to be decomposable (lexical items relate to the nonliteral meaning—'break the ice'), abnormally decomposable (key lexical items only partially cue the idiomatic meaning—'carry a torch'), or non-decomposable (the usual lexical meanings do not provide cues to the meaning—'chew the fat', 'kick the bucket'). Said another way, lexical meanings are transparent (relatively predictable from the words—'call it a day') or more or less opaque (meanings not predictable—'get the sack') (Gibbs and Nayak 1989, Burt 1992, Titone and Connine 1994, Cutting and Bock 1997, Giora 1999, Giora and Fein 1999).

An approach that integrates both the lexical-representation, idiomatic-only approach and the literal-first approach is called the 'configurational model' (Cacciari and Tabossi 1988), where words in the idiom have meaningful, weighted connections between them. In this view, a sufficient portion of utterance must be processed to cue the idiomatic meaning. Similarly, Titone and Connine (1999) propose a hybrid model, whereby idioms function both as word sequences that are semantically arbitrary (noncompositional) and as semantically transparent (compositional) phrases. These studies have attempted to resolve the controversy of whether idioms are special, and in what ways. However, when directly tested, three current approaches to understanding idioms—the Lexical Representation hypothesis (Swinney and Cutler 1979), the Configuration Hypothesis (Cacciari and Tabossi 1988) and the Decomposition Hypothesis (Gibbs *et al.* 1989b) fail to be supported because of inconsistencies in the results (Van de Voort and Vonk 1995).

Overriding these controversies, there is ample evidence that (1) non-propositional expressions (including idioms) have a special status in linguistic competence; (2) they occur in a broad range from fixed in their surface shape to potentially highly flexible; (3) they all are vulnerable to compositional alteration; and (4) formulaic expressions are known to the native speaker. A universal and ubiquitous flexibility permits a range of variations to be applied to any known, formulaic expression, with the obvious constraint that, to use the expression with intent in the discourse, it remain recognizable. The conditions and limits of these variation possibilities have not been established and it may not be possible to do so because of the potential creativity of grammatical processing.

Studies in child language acquisition

Studies of child language acquisition have drawn on various versions of a dual process model of language to explain many key observations (Bates *et al.* 1988, Echols 1993). The child's acquisition of forms reveals quite clearly an interface of holistic and analytic language processes. Interplay of holophrases—whole constructions having complex meanings—with linguistically reanalysed forms has been identified in language learning (Peters 1977, 1983, Corsaro 1979, Wong-Fillmore 1979, Vihman 1982, Locke 1997). Bolinger (1975) described the child language learning process as holistic at first, and later words 'are differentiated out

of larger wholes' (p.100). The undifferentiated phrases first employed by children are learned and utilized with a characteristic prosodic contour (Echols 1993). Parents explicitly teach children how to use speech formulas in appropriate contexts (Gleason and Weintraub 1976). Numerous studies have attempted to track the processes by which children learn how to understand proverbs and idioms (e.g., Prinz 1983, Bernstein 1987, Nippold and Martin 1989, Nippold and Haq 1996).

That propositional and non-propositional language competence proceeds at two different rates was suggested by a cross-sectional study of normal children ages 3–21 (Kempler *et al.* 1999). The Formulaic and Novel Language Comprehension Test (Kempler and Van Lancker 1996), which compares comprehension of matched propositional (e.g., 'He sees her drinking from a bowl') and non-propositional expressions (e.g., 'She has him eating out of her hand') using line drawings as response choices, was used to compare children's abilities to comprehend these two kinds of expressions across the age span. Children as young as 7 years old performed at adult levels on propositional (novel) items, but performance on common idioms, speech, formulas and proverbs revealed a slow curve, achieving full competence in adolescence. Explanations for the results observed in younger subjects include lesser exposure to formulaic expressions or the inability to work with the metalinguistics of a nonliteral matching task. However, in combination with other observations in natural language acquisition, these studies are at least compatible with the notion of two distinct cognitive processes for language processing, developing along two different maturational tracts. Frequency of exposure is neither necessary nor sufficient to explain the acquisition and maintenance of the very large repertory, which number at least in the hundreds of thousands. In the neurolinguistic section of this review (see below) an important source of evidence for the separability of all speech, residual utterances in severe aphasia, will be presented. Also called 'recurrent utterances', these are phrases spoken with fluency and ease, while much of linguistic function has been compromised following neurological damage. A very wide array of residual, recurrent utterances have appeared in aphasic patients, but 'yes' and 'no' common examples. As observed by Critchley (1970), the mere frequency of 'yes' and 'no' in normal diction cannot be the whole explanation for their important role as a recurring utterance because articles, prepositions, and conjunctions, which are higher in frequency counts, do not appear as residual utterances in aphasic speech (p.189). Instead, it is likely that a special, separable processing mechanism identifies, stores, and retrieves the non-propositional utterance, perhaps cued by the fact that the utterance does not compute according to the usual grammatical rules, and by unique properties of fixed expressions discussed above. In particular, the inherent affective, attitudinal, and social-contextual features may aid in rapid learning of fixed expressions based on one or few exemplars. This process contrasts with the one that is accountable for learning how to understand and produce new sentences.

Sociolinguistic corpus studies: incidence and classification

Studies of non-propositional expressions in normal speech as seen in natural speech corpora indicate a high incidence of fixed expressions in all kinds of discourse, as well as large total numbers of expressions (Strässler 1982, Norrick 1985, Arnaud

and Moon 1993, Sorhus 1977). Hain (1951) catalogued formulaic expressions in daily use among inhabitants of a small German village. Jay (1980) and Gallahorn (1971) tabulated cursing in specific populations (e.g., college students, elders, healthcare professionals on a psychiatric ward). Cowie (1992) examined ‘multiword lexical units’ differentiating idioms from collocations of various kinds in newspaper language. Moon (1998a) described formulaic expressions in the Oxford Hector Pilot Corpus (Glassman *et al.* 1992), an 18 million-word corpus of contemporary English. Sorhus (1977) reported about 20% formulaic expressions in a Canadian sample of spontaneous speech. Using computer-search criteria, Altenberg (1991, 1998) estimated that London–Lund Corpus (Svartvik and Quirk 1980, Greenbaum and Svartvik 1990) contained 80% recurrent word-combinations. Soskin and John (1963) found that 75% of expressions were other than information statements, but their classification system was based on meaning and intention of the speaker, rather than the formal and functional (utility in the conversational structure) criteria currently used. Overall, all studies reviewed indicate that formulaic expressions constitute a significant proportion of discourse, and that many different expressions form this set.

There is a venerable tradition of formulaic language studies focusing on literary texts, especially oral literature, (Tilley 1950, Kiparsky 1976, Mieder 1984, Kuiper 2000). For Homer’s *Iliad*, about one-fifth of the poem is ‘composed of lines wholly repeated from one place to another’ (Page 1959: 223). Schweizer (1978) reported an average of 14.8 idioms per page in six novels of Günter Grass. The plays of Ionesco utilize an abundance of speech formulas to artistic effect, as discussed by Klaver (1989).

It is well known that formulaic language studies are hindered by problems of nomenclature and classification. Further, little has been done to verify the classifications attempted by researchers. To develop better methods for classifying formulaic expressions, an analysis of conversational dialogue in a screenplay was performed, followed by a verification survey. These results were compared with measures made on natural conversational speech corpora (Vanlancker and Rallon 2003). A full one-quarter of the utterances in the screenplay were formulas, idioms, and proverbs. Examples are given in table 3, and the distribution of non-propositional expressions is shown in figure 5.

Table 3. Examples of non-propositional expressions from the screenplay *Some Like It Hot*, which was subjected to analysis to determine the incidence of speech formulas, idioms and proverbs in comparison with novel expressions (Wilder and Diamond 1959)

-
1. This the joint?
 2. Refresh my memory
 3. We’re all set
 4. When is the kick off?
 5. I better blow now
 6. It’s Goodbye Charlie
 7. Then hit ’em with everything you’ve got
 8. You bet!
 9. Good evening, sir
 10. I’ve been on the wagon
 11. This way, sir
 12. What’ll it be?
-

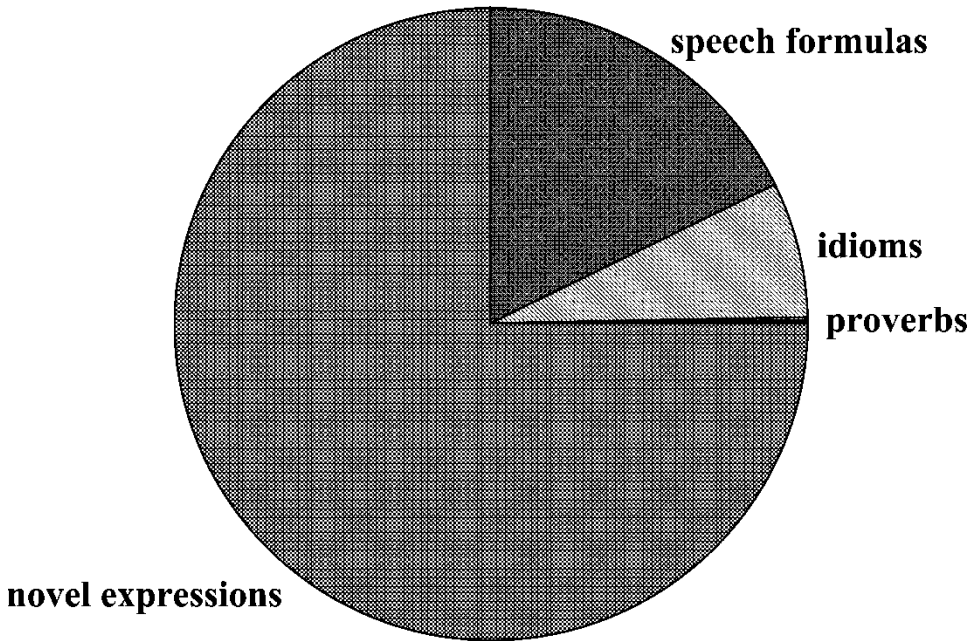


Figure 5. Distribution of non-propositional expressions, classified as speech formulas, idioms and proverbs, in the screenplay *Some Like It Hot* (Wilder and Diamond, 1959).

A survey obtained informants' responses to the classifications obtained in the analysis of the screenplay. Normal subjects completed non-propositional and propositional utterances (presented with one word missing) selected from the screenplay, and judged whether they were formulaic or novel. There was significantly greater agreement in words selected for completion of canonical formulaic expressions than of propositional expressions. Both types of utterances were identified at a high rate.

This study suggested that normal native speakers show knowledge of actual non-propositional exemplars, and can distinguish successfully between non-propositional and propositional speech. A similar finding is reported by Sípós (1984), who reported that probe words taken from idioms lead to higher scores in recognition memory for those idioms than words representing the meaning only. Similarly, subjects recognized idioms with missing phonemes better than matched novel phrases (Connine *et al.* 1992), as in Lieberman's (1963) sentence completion study. More successful completion of the missing words of formulaic than novel expressions probably represents the idiom completion effect, a well established observation in word association studies (Palermo and Jenkins 1964, Clark 1970, Church and Hanks 1990).

In a review of transcriptions of actual, natural conversation, consisting of unscripted telephone calls using nonsouthern American English (CALLHOME 2000), a large set of similar formulaic expressions was observed with, as in the screenplay, the largest portion being speech formulas. However, depending on topic and speakers, counts of formulaic expressions ranged widely. Examination was done of two unscripted telephone conversations, one a conversation about boyfriends between two females and the other between two males discussing

investment banking. In the first conversation, 95 or 48% of the utterances were familiar expressions; in the conversation between business persons, only 24% of the utterances were. Further, in all the natural speech texts examined, there were more word and phrase repetitions, sentence fragments, and pause fillers (e.g., like, ya know, um, well) than observed in the screenplay, *Some Like It Hot*. Factors such as gender and socioeconomic status of the conversational partners, their topics, and the level of formality or intimacy of their talk have been reported to affect the frequency and type of formulaic expressions in other natural corpora (e.g., Strässler 1982, Swales 1990, Moon 1998b), and pause-fillers are often more common. Using the category 'preformatted utterances', Sprenger (2003) studied incidence in Dutch written texts, and suggested that the number arrived at in her analysis, 10%, underestimated conversational usage. The study of incidence of formulaic expressions in language use has only just begun, and promises to reveal a great deal about human communication.

Brain processing of non-propositional speech: production

In the history of aphasiology, clinicians beginning with Jackson (1874, 1878) and continuing with Crichtley (1970) noted consistently preserved forms of speech in aphasia, alongside characteristic losses (for reviews, see Van Lancker 1975, 1987, Code 1987). Numerous aphasiologists of the first half of the 20th century routinely described the preservation in aphasia of different types of non-propositional speech, using a range of terminology and characterizations (Darley 1982).

According to Pick (1931/73), an exception in aphasic speech appears for intact sentences that are 'automatic'. Henry Head (1926), a neurologist who specialized in language disorders, stated that non-propositional speech appears first in both receptive and expressive aphasia. The French neurologist Pierre Marie (1925/71) noted that a dissociation between voluntary speech and automatic speech is a common clinical observation. Similarly, Alajouanine (1956) noted that 'situations leading to emotional, expletive, interjectional, automatic, and habitual language are always more effective [in producing speech] than those requiring volitional or propositional expressions' (p. 28). The Russian neuropsychologist Luria (1947) observed that speech patterns involving 'simple verbo-motor habits or which express affective states' may be retained (p. 281). Clinical observations in aphasia reveal a ubiquitous, albeit highly varied presence of preserved holistic expressions: speech formulas, pause fillers, expletives, sentence stems, serial speech, and proper nouns (Luria 1966: 521–522).

From Germany, Kurt Goldstein (1948), who championed the distinction between abstract and concrete thought, included non-propositional language in his category of the concrete attitude. He repeatedly observes that emotional language and 'other speech automatisms' are less impaired in aphasia (p. 25). He also cited numerous examples of patients using conventional expressions only, and highlighted particularly proper names.

This phenomenon has been observed in all kinds of aphasia (Haas *et al.* 1998). Patients with extensive left hemisphere damage are very frequently observed to swear, use conventional utterances and pause-fillers, such as 'oh', 'um', 'well', 'uh', and sentence initials, such as 'it's a'; 'no' is also frequently observed as residual aphasic speech (c. Hagen, Personal communication, 1972). Espir and Rose (1970)

described emotional utterances, automatic speech, serial speech, social gestures of speech as preserved in aphasia; Bay (1964) described aphasia as an inability to propositionalize; Gloning *et al.* (1963) noted use by language-disordered persons of the automatic greeting and other 'semi-automatic sentences' of casual conversation; Goodglass and Mayer (1958), pioneers of aphasiology studies developed in the Boston VA Medical Center, described a 'fundamental psychological principle which reappears many times ... that the aphasic is most apt to fail in communication which requires a volitional act of symbolic formulation, but that he performs most readily in an automatized or otherwise highly structured speech situation' (p. 101). Wepman *et al.* (1956) noted that anomic patients retain 'the conventional formulae of language' (pp. 476–477). In a description of three agrammatic patients, 'each patient was found to have at his command a number of stereotyped familiar expressions', which were used separately from information-bearing utterances requiring syntactic rules (Myerson and Goodglass 1972: 41–2).

Kriessler and Fradis (1968) observed that in all kinds of aphasia, motor articulation is dramatically better during 'emotional speech', and these authors attribute to the right hemisphere the ability to produce 'stereotype language, stereotype formulas, of the most common and frequent use, polite expressions, typical and typified responses, slogan speech, etc.' (p. 111). In an study of a surgical patient with sudden onset of a motor speech apraxia, which included frequent insertion of the syllable 'sis', Van Lancker *et al.* (1983) reported that the intrusive syllable increased during reading, counting from one to 10, and reciting prayers and other memorized material, and was reduced during propositional speech. No site of neurological damage could be determined at the time.

Extensive examples given by Jackson (1874, 1878), Critchley (1970), Code (1982), Blanken *et al.* (1990) and Van Lancker and Cummings (1999) clearly indicate that except for 'yes' and 'no', certain expletives, and a set of sentence initials (e.g., 'I want'), which occur frequently as recurrent or residual utterances in aphasia, there is still considerable variability. Many recorded items are unique to individual patients. This becomes understandable when facts about non-propositional expressions in normal language are considered. While counts have not been definitely achieved, as mentioned previously estimates of non-propositional expressions in English point beyond the hundreds of thousands (Weinreich 1969, Jackendoff 1995). In attempting for several years to compile a list of speech formulas, Fillmore (1979) and his students did not reach an upper limit. Therefore, variability in the actual forms of preserved non-propositional speech in aphasia is to be expected.

Clinical observations in chronic aphasia suggest that nearly all language-afflicted patients can count to 10; in contrast, a smaller number can recite other serial lists (e.g., the days of the week and the alphabet to G are performed more readily than the months of the year). Sentence-initial phrases, swearing, nursery rhymes, lyrics, and varied memorized material are also often retained. Speech formulas and proper nouns are also observed. Most such residual utterances are short, and the ability to produce longer utterances, such as idioms and proverbs, or discourse units, such as prayers and recitations, including the American Pledge of Allegiance, appears less frequently, although pieces of these memorized texts are sometimes produced.

Formal studies of production abilities in aphasia support the long-held impression from clinical observations about preservation of 'automatic speech'. Lum and Ellis (1994) demonstrated in a carefully designed study that some kinds

of non-propositional speech are relatively preserved in aphasia. Using three pairs of tasks, they compared speech production abilities in propositional or non-propositional contexts. For task one, counting from one to 10 was compared with naming arabic numbers from one to 10 in nonconsecutive order; for task two, naming pictures with cues from familiar nonliteral expressions (e.g., Don't beat around the BUSH) was matched with naming pictures using novel phrase cues (Don't dig behind the BUSH); and in task three, repeating well-known, overlearned phrases was compared with repeating novel phrases. The 16 aphasic patients tested showed better performance on non-propositional tasks for number production and picture naming, and a weaker advantage for phrase repetition. Patients varied, but there were no examples of better performance on the propositional than the non-propositional version of any task. A similar finding was reported by Van Lancker and Bella (1996), comparing matched propositional and non-propositional expressions in aphasic speakers, in repetition and sentence completion. For the aphasic speakers performance on sentence completion was superior for the non-propositional members of the matched pairs. As in Lum and Ellis (1994), results were also weaker for the repetition task.

An adult patient, AC, diagnosed with transcortical sensory aphasia, was observed to use formulaic expressions almost exclusively in fluent speech, as can be seen in this sample of conversation:

AC: I came, I saw, I conquered.

Clinician: What else did you use to do? ... Were you an engineer?

AC: Yes, I was an engineer. It's more important. It's that I ... I said good morning. I said good morning. And ... or ... I didn't even say good morning. I just said Hi, how are you? How are you? And we ... we ... Hi, good morning. How are you. It was 9, 8:30, 9:00. I decided to ... I did very, very well, and then, all of a sudden. It's a long story. But I think I know what I'm talking about. I hope so. I hope so, too.

AC, a 66-year-old, right-handed businessman, who suffered a left frontoparietal stroke, had fluent, well-articulated speech and intact repetition, but severely impaired comprehension and naming. Conversational speech was obtained by videotaping dialogues between AC and the clinicians. Non-propositional expressions were identified, classified, and counted by category. When incidence measures from this aphasic speaker were compared with the screenplay dialogue and the two non-scripted telephone conversations, described above, a large difference between the aphasic and the normal speech samples was observed, with significantly more non-propositional expressions in the aphasic speech (Vanlancker-Sidtis 2001) (figure 6). Despite a severe deficit in propositional speech, AC was also able to complete 50% of idiomatic expressions presented to him with the last word missing.

A similar completion ability, corresponding to the propositional/non-propositional dichotomy, was observed in a severely aphasic 59-year-old aphasic woman, who never produced a meaningful utterance, but could complete idioms and other familiar conventional expressions (Whitaker 1976). Idiom completion in a case of transcortical sensory aphasia was also reported by Nakagawa *et al.* (1993).

Transcortical sensory aphasic speech is often characterized by excessive talking and intact repetition, and it is likely, given the severe semantic deficits in the disorder, that much of the talk is made up of non-propositional expressions, as was the case with AC. On first interactions, AC, who was profoundly impaired in

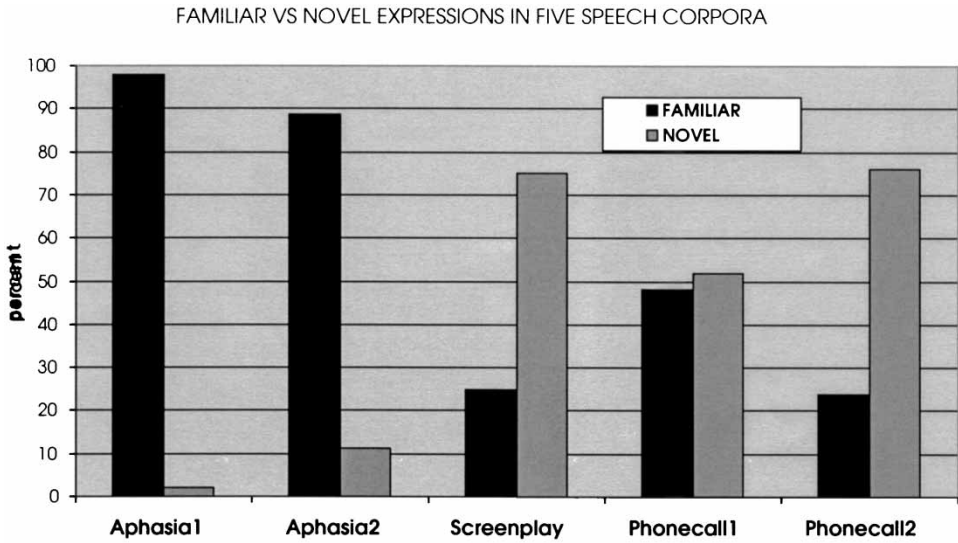


Figure 6. Proportions of formulaic and novel expressions for A.C., a patient with transcortical sensory aphasia, transcribed from two conversations with clinicians, and for two healthy persons participating in conversations.

propositional language ability, appeared almost normal in communicative function. His language disorder was not identified during several months of attendance in a clinical daycare programme. Focused studies on this question have not been done. In his book on transcortical aphasia, Berthier (1999) also gives a hint of preserved speech formulas: ‘Sometimes the utilisation of predilection words [definition not given in this text] and coined expressions are the only precise lexical segments recognisable in sentences’ in patients with prevailing semantic jargon (p.76). A comparable dichotomy, modal versus referential, has been proposed by Nespoulous *et al.* (1998), which they suggest is useful in describing aphasic speech. In modal speech, the patient communicates expressions of feeling and attitude (‘I am very happy to ...’), in contrast to single, substantive word usage, referential speech, which communicates information. Modal speech consists of numerous conventional expressions. Similarly repeated sentence stems were observed in an aphasic speaker by Buckingham *et al.* (1975).

Using survey methods, Code (1982), Blanken (1991) and Blanken and Marini (1997) documented actual incidence of recurrent utterances in a series of chronic, severely aphasic persons. Similar categories of residual utterances were seen in the British English and German patients sampled: swearwords, interjections and greetings, numbers, sentence-stems, and proper nouns. Their observation of preserved proper nouns in the set of automatic speech categories is of special interest, as will be explained below. A report of ‘long sequences of speech automatisms’ following traumatic brain injury included familiar proper names, overlearned expressions, expletives, trademarks, and advertisements, mostly fragments of premorbidly overlearned materials and information (Pena-Casanova *et al.* 2002). Return of propositional expressions appeared slowly.

Graves and Landis (1985) compared production of automatic and propositional speech in aphasic speakers and suggested that automatic speech was produced

by the right hemisphere. By measuring mouth openings during production of automatic and propositional utterances, these authors demonstrated greater opening of the right side of the mouth for spontaneous speech, repetition, and word list generation, while greater opening of the left side of the mouth was observed for serial speech and singing. A role of the right hemisphere in residual speech was postulated on the basis of symptomatic worsening in left-brain-injured aphasic patients after temporary right hemisphere inactivation by intracarotid amobarbital injection (Kinsbourne 1971, Czopf 1981) or diminution of residual speech brought about by a new stroke to the previously intact right hemisphere (Cummings *et al.* 1979, Mohr and Levine 1979).

Other evidence for right hemisphere support of non-propositional speech comes from an interview with a right-handed adult, EC, shortly after surgical removal of his left hemisphere for treatment of a tumour (Smith 1966, Smith and Burklund 1966). Although profoundly aphasic and unable to produce propositional responses to questions or requests, in 5 minutes of filmed conversation EC produced nine well-articulated expletives, five sentence stems, and numerous pause-fillers (Van Lancker and Cummings 1999). Other reports of left hemispherectomized patients report similar speech output. Zollinger (1935) reported that following dominant hemispherectomy, the patient said 'all right', 'yes', 'no', 'goodbye', and 'please'. Another patient, on the 16th postoperative day, said 'mother', 'father', 'I don't know' (Hillier 1954); another uttered 'yes', 'no', 'I don't want any' (Crockett and Estridge 1951). Describing RS, who underwent left hemispherectomy at age 10, Gordon (1973) reported that her first speech production abilities were to count, say her name, sing 'Jingle Bells', and to produce automatized speech sequences well. Zangwill (1967:1017) reviewed left hemispherectomy cases and concluded that 'the right hemisphere—possibly in association with subcortical mechanisms—was sustaining a measure of language. In particular, comprehension and emotional utterances were clearly present'. In all these cases of severe left hemisphere damage and removal of the left hemisphere, whatever propositional language (a few nouns) was in evidence was invariably minimal compared with the greater preservation of non-propositional expressions.

It has often been observed that in many cases of severe language loss following left hemisphere damage, only swearing remains. While any other attempts at producing speech are effortful, distorted and irremediably deficient, expletives flow forth with normal articulation, phrasing, and intonation (Van Lancker and Cummings 1999). This suggests that swearing is produced by neural mechanisms other than those underlying other speech behaviors. Only relatively recently have people written about swearing in normal communicative behaviour (Montagu 1967, Hughes 1991). The systematic observational studies both in the laboratory (Foote and Woodward 1973) and in the field (Gallahorn 1971, Jay 1992, 1996, 2000) indicating that swearing occurs across genders, age, or geographic or socioeconomic background, were reviewed above. In Gilles de la Tourette syndrome (Shapiro *et al.* 1983), the intrusive utterances reported for American and British English, for American Sign Language, and for Spanish (Spain and Peru), Portuguese (Brazil), Danish, German, languages in Hong Kong and Sri Lanka, Italian, and Japanese are overwhelmingly taboo terms in the native language (except for a few conventional expressions) (see the complete listing in Van Lancker and Cummings 1999). A significant site of impairment in Gilles de la Tourette's disease is the basal ganglia (Balthasar 1957, Nauta 1982, Regeur *et al.* 1986, Cummings 1993, Georgiou *et al.*

1995, Palumbo *et al.* 1997, Singer 1997). Transient hyperstimulation of the basal ganglia occurs during surgical intervention for relief of motor disorders, when nuclei in the basal ganglia are electrically stimulated to determine areas of dysfunction. Using deep stereotactic electrical stimulation, Schaltenbrand (1965) elicited stereotyped 'compulsory' utterances, such as 'thank you' (also Schaltenbrand and Woolsey 1964). Schaltenbrand likened this speech behaviour to observations in aphasic patients described by Hughlings Jackson.

Speedie *et al.* (1993) also suggested a role of the right basal ganglia in the production of some types of non-propositional speech. Following a right basal ganglia lesion, a right-handed man, age 75, was unable to recite familiar verses which he had routinely said daily for many years. Serial automatic speech, singing, recitation of rhymes, and swearing were impaired, and only idioms and social greetings were preserved. Speech no longer contained overused phrases and he could comprehend automatic speech. In contrast, propositional speech was preserved in both the languages known to him, French and Hebrew. Worse impairment of non-propositional than novel speech production following neurological damage involved the intrusive syllable 'sis' mentioned above (Van Lancker *et al.* 1983), but no site of damage was identified. With advances in brain imaging techniques and more neurolinguistic knowledge, a subcortical lesion might now be proposed for this unusual presentation.

A similar report occurred after a hypoxic stroke to the bilateral caudate and putamen, as observed on MRI and PET scan radiography. Following this medical event, this a 36-year-old woman lost use of speech formulas, such as greetings and social expressions, in everyday interaction (Van Lancker *et al.* 1996), as confirmed by her own report and by recorded interactions with the clinician. It is a common clinical occurrence that persons in the advanced stage of Alzheimer's disease, who have lost most higher cognitive function, retain the ability to express non-propositional expressions, especially interactional speech formulas (Cummings 1985, Kempler 1990). Retention of the motor-production ability for non-propositional expressions points to a role of frontosubcortical systems in this ability, as these brain structures remain least affected through these stages of the progressive disease (Cummings and Benson 1983, Cummings 1993).

While damage to subcortical nuclei have been implicated in the few cases of impaired non-propositional speech, no such difficulties have been associated with thalamic damage. A review of language after thalamic damage suggested that non-propositional speech was relatively preserved following left thalamic damage (Jonas 1982).

The questions about neural representation of residual aphasic speech have been investigated by functional imaging studies. In one such study (Van Lancker *et al.* Grafton 2003), aphasic patients who had suffered a single, unilateral stroke in perisylvian region were compared with normal control subjects performing three vocal production tasks: (1) animal names, (2) nonlinguistic vocalizations, and (3) counting. Behavioral measures differed significantly between normal controls and patients for generation of animal names, but not for vocalizations or counting. Using partial least squares (PLS) analysis (McIntosh *et al.* 1996), three significant latent variables were identified. Figure 7 provides a representation of relative numbers of brain areas associated with the three latent variables identified in the partial least-squares analysis with respect to left hemisphere, right hemisphere, and subcortical sites. The group-design-brain profile identified greater left frontal activation for naming and non-verbal vocalization, while more right hemisphere and basal ganglia areas were identified for counting. For aphasic subjects, naming

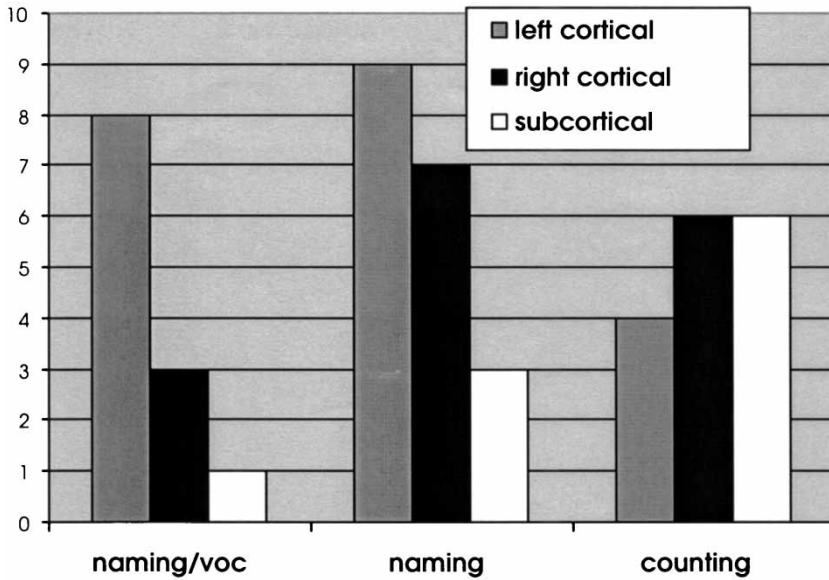


Figure 7. Results of a PET study of non-propositional speech showing that more left hemisphere sites were identified in association with naming, while more right hemisphere and subcortical sites were associated with counting in normal speakers.

and non-verbal vocalization were associated with relatively more bilateral structures. These results suggest that naming is more likely to activate traditional language structures in the brain than counting.

Another study using PET imaging in normal subjects employed two speech tasks traditionally considered to be automatic: a serial task (months of the year) and a well-rehearsed, memorized text (the American Pledge of Allegiance) compared to tongue movements and consonant–vowel syllable production (Bookheimer *et al.* 2000). Continuous production of the Pledge of Allegiance showed activation in traditional language areas; reciting the months of the year engaged only limited language areas (Brodmann areas 44 and 22). Tasks did not include counting, which is the automatic speech behaviour most frequently observed in aphasia, and is most commonly used in intraoperative cortical mapping for speech. In a preliminary report using PET imaging, differences in brain activation patterns for counting compared with story telling were described (Blank *et al.* 2001). Earlier studies of cerebral blood flow using SPECT methodology also associated right hemisphere activation (as well as left) with automatic speech (Larsen *et al.* 1978, Ingvar 1983, Ryding *et al.* 1987).

Brain processing of non-propositional speech: comprehension

Numerous studies in comprehension of formulaic language also implicate the right hemisphere, and thus suggest a neurological dissociation in processing of normal and formulaic language. This is especially true for idioms (Winner and Gardner 1977, Myers and Linebaugh 1981, Van Lancker 1987, Bryan 1988, Burgess and Chiarello 1996) and has been reported for indirect requests, which are frequently formulaic (Weylman *et al.* 1989). The Formulaic and Novel Language Comprehension Test (FANL-C) (Kempler and Van Lancker 1996) was administered to unilaterally

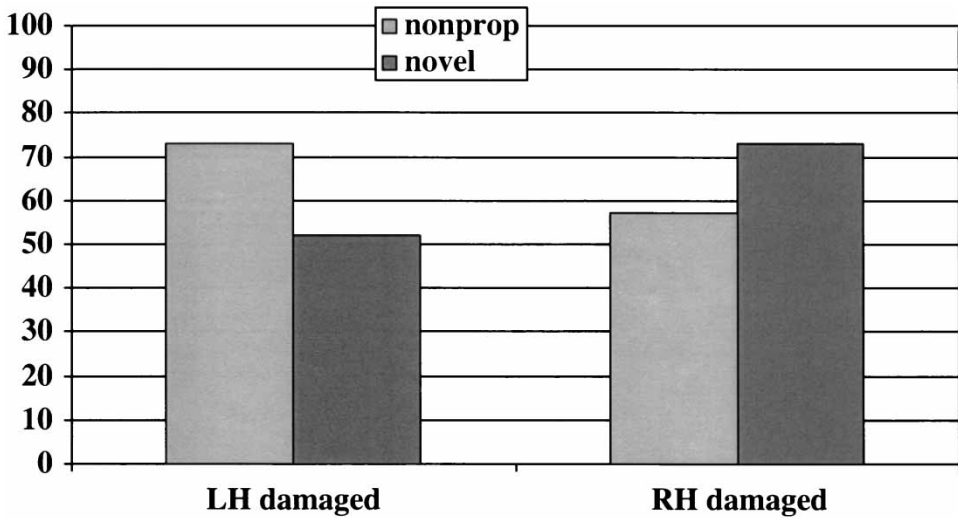


Figure 8. Results on the FANL-C (Formulaic and Novel Language Comprehension) test obtained in persons with left or right brain damage, showing that left-sided damage is associated with relatively preserved comprehension of formulaic expressions compared with novel expressions, while right-sided damage is associated with impairment of formulaic expressions.

brain-damaged subjects. A ‘double dissociation’ was observed, such that left hemisphere-damaged subjects performed poorly on literal expressions but relatively better on idiomatic and formulaic language, while right hemisphere patients performed relatively worse on formulaic and idiomatic language than on novel expressions (Van Lancker and Kempler 1987, Kempler *et al.* 1999) (figure 8).

Surveys of residual productive speech in severe aphasia, reviewed above, identified proper nouns among the preserved utterances suggests that proper nouns might be conceptually included in the category of non-propositional speech (Code 1982, 1989, Blanken *et al.* 1990). In the two corpora, drawn from British English and the German aphasic speakers, 13% of utterances recorded from patients surveyed were proper nouns (see Van Lancker and Cummings 1999 for complete listing). Comprehension studies in globally aphasic patients (Wapner and Gardner 1979, Van Lancker and Klein 1990, Van Lancker and Nicklay 1992, Warrington and Clegg 1993, Yasuda and Ono 1998) further supported the notion of preserved proper nouns comprehension despite severe propositional language disability. When unilaterally brain-damaged patients were tested on proper noun recognition, the right hemisphere group was more impaired in matching a famous name to a face (Van Lancker *et al.* 1991). The hypothesis that proper noun comprehension is associated with right hemisphere processing was further tested by studying healthy controls using a split visual field format (Ohnesorge and Van Lancker 2001, Van Lancker and Ohnesorge 2002). Performance was superior in the right visual field (left hemisphere) for matched common nouns as expected. In support of the right hemisphere hypothesis, normal subjects performed well in both hemispheres (visual fields) on famous proper nouns. These studies used rating instruments to reveal that right hemisphere performance was enhanced when proper nouns were highly familiar to the subjects.

While a role of the right hemisphere has been implicated for processing of much of non-propositional speech, a study examining the impact of callosal absence on the

processing of non-propositional expressions suggested that normally developing communication between the two cerebral hemispheres is required (Paul *et al.* 2003). Non-retarded adult males with agenesis of the corpus callosum but without focal brain damage were evaluated using the Formulaic and Novel Language Comprehension Test (FANL-C) (Kempler and Van Lancker 1996) and the Gorham Proverbs Test (Gorham 1956a, b). The acallosal subjects were significantly impaired on the non-propositional items of the FANL-C, but were not different from controls in comprehension of propositional items. Other studies, focusing on proverb interpretation, have suggested that both hemispheres are required for normal performance (Benton 1968, Van Lancker 1990) due in part to task demands (Tompkins *et al.* 1992).

Using the FANL-C, loss of non-propositional language comprehension was seen in early stages in Alzheimer's disease (Kempler *et al.* 1988, but see Papagno 2001). The dissociation between production of non-propositional utterances, which is retained until late stages, and comprehension of non-propositional expressions, which is impaired early on, might be accounted for by the known cerebral involvement in the disease. Temporal–parietal cortical areas become affected first, yielding the cognitive–linguistic deficits, while frontal–subcortical systems remain intact until the terminal stages, allowing for longer preservation vocal–motor functions, which include production of non-propositional expressions.

Toward a dual-process model of language processing: linguistic and neurolinguistic arguments

If, as Jackendoff stated in 1978 (p. 201), 'the goal of contemporary linguistic theory is a description of what it is that a human being knows when he knows how to speak a language', then a full integration of non-propositional language competence into a model of language processing must be undertaken. Only fragments of incidence studies are available, yielding only rudimentary classification and counts of non-propositional expressions. A good estimate is probably an average of about 25% of spoken utterances are non-propositional expressions across various kinds of discourse. Influencing variables are topic, speakers, and social context, with casual conversation between familiars expected to have the highest proportion of non-propositional expressions, compared with a formal discourse, having the least. Linguistic descriptions covering the infinite set of newly created sentences, therefore, account for about three-quarters of human language competence.

As noted previously, an important feature of formulaic expressions is that people know them. Speakers and listeners may literalize, decompose, semantically adjust, and manipulate the expressions in myriad ways, but the underlying canonical forms and conventional meanings are known and used as familiar. As Titone and Connine (1999:1665) have stated:

Consistent with the noncompositional approach, idiomatic expressions are highly overlearned word sequences that comprehenders experience as holistic units. That the component words of idioms influence their interpretation does not discount the possibility that there exists a prepackaged meaning associated with very particular configurations of words.

Over the past 20 years, studies of idioms have pointed to the need for a dual processing model. The controversy in linguistic studies about how idioms are to be represented in a grammar—as frozen lexical items or weighted configurations, and how to characterize

elements of noncompositionality and decompositionality—has not been resolved. Gibbs' view (1995), that processing of idioms utilizes the same compositional parsing strategies used for novel expressions has arisen from numerous studies showing how transparent, flexible, and decomposable idioms can be. Even non-composable idioms are not truly frozen (Reagan 1987, Kuiper 1997), and putative differences between decomposable and non-decomposable forms are not compelling in behavioral studies (Cutting and Bock 1997). Neither the lexicalized nor the compositional approach to idiomaticity, taken alone, is satisfactory (Titone and Connine 1994). Inconsistent results in idioms studies depend on the extent to which each process, compositional or holistic, is engaged by the particular task design, and how much the two processes are caused to interact in the experimental setting. The results of psychological studies provide evidence for both compositional and noncompositional processing (Titone and Connine 1999). When two distinct modes of processing are posited in a model of language competence, it can be seen that formulaic expressions can be processed holistically or compositionally or somewhere in between. Recent psycholinguistic research affirms the notion that fixed expressions 'are both compositional and holistic at the same time' (Sprenger 2003:115). As suggested by Burgess and Chiarello (1996), who argue for both top-down and bottom-up processing for idioms, these apparent discrepancies are easily handled by the dual-process approach to a model of human language.

Left alone, the non-propositional utterance has a stereotyped lexical and intonational configuration with a conventionalized meaning, but any non-propositional expression is vulnerable to compositional alteration. The interplay of the two modes of language competence, processing formulaic and novel language modes, allows for the mixing of nuance and tradition (inherent in formulaic expressions) with the clarity and novelty of novel expressions. Both kinds of language abilities are required for rich and thorough communication.

A form in language that both represents and illustrates this interplay of formulaic and novel language are known as 'schemata' (Lyons 1968) or 'phrasal lexical items' (Kuiper and Everaert 2000). Schemata are fixed forms with at least one open lexical slot, such as 'Down with _____'. These expressions exist only as a scaffolding, into which one of a paradigmatic set of words must be inserted, with a varying range of possible entries. Examples are 'A few _____ short of a _____', e.g., bricks, load; 'If you had my/his _____, you'd be _____ too', e.g., wife, drunk; 'I'm (not) a _____ person', e.g., morning; 'a _____'s _____', e.g., carpenter, carpenter. The existence of this large set of expressions vividly depicts the two processes, holistic and creative, at work (see the examples in table 4). Using these expressions provides the benefit of a well-worn phrase with the creativity of newly inserted material. This process is applicable to all formulaic expressions, including those with standard canonical forms.

Rather than being considered anomalies in language use, schemata, allusions to formulaic structure in discourse, and variations on non-propositional expressions reflect a common creative practice in human language competence. Attempts to account for these observed phenomena have led to assertions, such as those of Gibbs (1995), that formulaic and novel language are simply processed in the same way. A better approach accommodates both the similarities and differences between the two types of language. The dual-process model incorporates two disparate neuropsychological abilities: compositional and holistic processing, and accounts for how holistic expressions can have features of compositionality. Idioms

Table 4. Examples of schemata, which are partially fixed, but feature open slots that allow for an array of creative lexical insertion

-
1. A whole nother _____
 2. A ____ without _____ is like a ____ without _____
 3. a _____'s _____
 4. All those _____ look alike.
 5. a _____ among _____
 6. Do I look like a _____?
 7. fuck _____
 8. He's a _____ among _____
 9. I wouldn't give you _____ for his _____
 10. I'm (not) a _____ person
 11. I'm on that like _____ on _____
 12. If you had his/my _____, you'd be ____(-ing) too.
 13. If you believe that, _____
 14. like _____, like _____
 15. mother of all _____
 16. Some of my best friends are _____
 17. The proof is in the _____
 18. Wadda I look like, a _____?
 19. What? Do I look like a _____ to you?
 20. Who do I look like? A _____?
 21. Why Johnny can't _____
 22. X is a few _____ short of a full _____
 23. X is not the _____ est _____ in the _____
 24. You're like a _____ to me.
 25. You've seen one _____, you've seen them all.
 26. _____ as a _____
 27. _____ fool.
 28. _____ much?
 29. _____ city.
 30. _____ this.
 31. _____ and proud.
 33. _____ crazy.
 34. _____ shm _____
 35. _____ is as _____ does.
 36. A _____ does not a _____ make.
-

provide a clear example, in that the various levels of literal and nonliteral meanings can be simultaneously communicated, as in the example (where 'literally' is used as an intensifier) by Cacciari and Glucksberg (1991):

William: David is really weak; I bet he spilled the beans.

Alice: Spill? He literally poured them all over the place.

Paradoxically, true creativity in language consists not in generating ever new sentences, but in mixing old (formulaic and overlearned) and new.

Each mode, propositional and non-propositional, places different processing demands on speech production and comprehension. Production of propositional expressions requires lexical retrieval and arrangement according to grammatical rules; non-propositional production involves activating and retrieving prepackaged units or schemata. Similarly, comprehension demands involved grammatical and lexical analysis for propositional language in contrast to apperception of a configured phrase and mapping onto its complex meaning. Multiword formulaic expressions are "ready to speak", thus facilitating fluency' (Harris 1998: 69). Shifting

between modes during speech processing allows for a cycling of these disparate cognitive demands and a distribution of effort between types of task.

Whatever the particular results of studies of mental processing of propositional and non-propositional expressions, a picture emerges of relatively fixed, known expressions on the one hand, and fully novel expressions on the other hand, with the easy possibility of interleaving the two. The observation that both syntactic and semantic levels can be observed in the processing of idioms supports the notion that the two potential processes, analytic and holistic, are continuously operational in language processing (Peterson *et al.* 2001).

The dual-process model of language accommodates two types of language ability along with a dynamic interaction between them and provides a basis for explaining many psychological observations. Properties of formulaic language, previously perplexing and seemingly contradictory, can be accommodated in the dual-processing model. Questions about degrees of compositionality, as inherent in the expressions themselves, can be put aside. A search for constraints (Kuiper 1997, Kuiper and Everaert 2000) is probably not likely to succeed because generative operations can potentially be applied to any fixed form. A role of familiarity or saliency is to be expected in successful recognition of the non-propositional item (Schweigert 1986), and in determining which processing mode has the ascendancy (Giora and Fein 1999); this is because familiarity with the expression aided in recognition of both the literal and the nonliteral meanings (Forrester 1995). In the dual-process model, both literal and metaphoric meanings in the constituent words of the formulaic expression can also be expected to have potential impact (Glucksberg 1991, 2000).

The dual-process model has been proposed by several previous scholars. Tannen (1989: 3) proposed a model of language that allows for alternation of 'fixity and creativity'. To describe grammar adequately, Hopper (1988) speaks of both 'a priori' and 'emergent' modes. Lounsbury (1963) spoke of ad hoc constructions and others that are 'familiar and employed as a whole unit', adding that 'their psychological statuses in the structure of actual speaking behavior may be quite different' (p. 561). Bolinger (1961, 1976) has long spoken of an interplay between remembered and newly created speech, providing evidence that these unitary expressions interact continuously with newly created output (Bolinger 1977). He believed that memorized expressions play a significant role at all levels of grammar (Bolinger 1976). The presence of a large number of irreversible binomials, such as 'salt and pepper', 'up and down', as well as three member expressions such as 'red, white and blue', which are fixed but are not strictly non-propositional expressions, attests to the widespread presence of this holistic process in language (Malkiel 1959, Mitchell 1971, Cooper and Ross 1975).

Sinclair (1987, 1991) posits the 'open choice' and the 'idiom' principles as underlying all text description. Several linguistic studies have focused on 'collocations', 'set phrases' or 'bound expressions' (Kiparsky 1976, Mackin 1978), such as 'rapt attention', 'fuss and bother', 'to all intents and purposes', and which suggested that a large sector of the language consists of holistically configured expressions. Fillmore *et al.* (1988: 534) proposed to integrate compositional descriptions with 'serious grammatical consideration of the "realm of idiomaticity in a language"'.

Dramatic evidence for a dual-process model of language comes from studies of the brain. Clinical observations in Alzheimer's disease (Kempler *et al.* 1988),

Tourette's syndrome (Van Lancker and Cummings 1999), basal ganglia stroke (Speedie *et al.* 1993, Van Lancker *et al.* 1996), left hemisphere damage (Code 1989), and left hemispherectomy (Van Lancker and Cummings 1999) all point to roles of the basal ganglia and the right hemisphere in production and comprehension of non-propositional expressions. This proposal is supported by views of the basal ganglia as instrumental in initiating, monitoring, and executing overlearned motor gestures (Marsden 1982, Baev 1997).

Most researchers agree that the two human cerebral hemispheres have 'different information-processes abilities and propensities' (Hellige 1993). The complexity of these differences remains difficult to characterize in any single dimension. Studies of letter processing have suggested hemispheric differences correlating to global versus local processing (Martin 1979, Van Kleeck 1989). A comparable dichotomy differentiating hemispheric preferences, called categorical versus coordinate, has also been proposed (Kosslyn *et al.* 1989). Specific studies of communication have suggested a predilection for right hemisphere processing of social and real-world contextual associations for lexical (Sidtis *et al.* 1981, Drews 1987, Chiarello 1995, Robertson 1995, Titone 1998) and discourse material (Brownell *et al.* 1986, Joannette and Brownell 1990, Joannette *et al.* 1990, for reviews, see Van Lancker 1991, 1997).

The well-known theory of dichotomous modes of processing between left and right hemispheres, whereby the left hemisphere is superior at sequential and computational operations, and the right hemisphere specialized for holistic and configurational recognition, easily accommodates the dual-process approach to language processing (Bogen 1969, Van Lancker 1973, Bever 1975, Bradshaw and Nettleton 1983, Hellige 1993). Since Lenneberg's (1967) comment that 'ordinarily the left hemisphere is more directly involved in speech and language functions than the right, though the lesser hemisphere is not passive with respect to verbal communication' (p. 150), much has been learned about the role of the right hemisphere in human communication. At present, there is a general consensus that the left hemisphere is specialized for 'ortholinguistics': phonetics, phonology, morphology, syntax, and some lexical processes, with the various elements associated with 'paralinguistics', or the pragmatics of language, requiring the additional benefit of an intact right hemisphere (Hellige 1993; Van Lancker 1997, Myers 1998).

To account for learning and memory processes underlying behavior, previous researchers in brain function have proposed two basically different types of processing. These are reflected in Robinson's (1987) dichotomy of emotive versus elaborated speech; a proposal for differential brain bases for human as compared with animal vocalizations (Ploog 1979); the distinction between habitual and declaring memory (Mishkin and Petri 1984, Mishkin *et al.* 1984) which is similar to the categories of procedural and semantic memory (Squire 1982, 1983); and Marsden's (1982) contrast between automatic and planned execution. A similar dichotomy was elaborated by Koestler (1967), who proposed a hierarchical system from novel to habitual behaviours in the nervous system, corresponding, like the other proposals above, to its vertical organization (table 5).

The appearance of speech automatism sequences in a head-injured patient was attributed to her particular injury, which may have released brain structures committed to overlearned verbal material (Pena-Casanova *et al.* 2002). Lieberman (2000, 2001) has associated overlearned motor behaviours of speech with the highly evolved basal ganglia in humans. This dichotomy in human behaviours has

Table 5. Dichotomies correlating to the dual processing model suggesting two significantly different processing modalities and arising from various disciplines in neurology and psychology

Source	Dichotomy	
Ploog (1979)	Animal vocalization	Human speech
Robinson (1987)	Emotive speech	Elaborated speech
Mishkin <i>et al.</i> (1984)	Non-declarative	Declarative memory
	Habitual memory	New learning
Marsden (1982)	Automatic execution	Planned execution
Squire (1982, 1983)	Procedural memory	Semantic memory
Koestler (1967)	Routinized behaviour	Novel behaviour
	Habitual behaviour	Conscious, created behaviour

been referred to as controlled versus automatic information processing (Shiffrin and Schneider 1977). Thus the dual-operations model of language has a basis in theory of cerebral function in at least two dimensions: a horizontal plan, emphasizing distinctive roles of the left and right hemispheres, and the vertical dimension, reflecting a hierarchical organization of the nervous system from habitual to novel behaviours.

Clinical implications

An understanding of the dual-process model of language processing can lead to new insights and approaches in the evaluation and treatment of speech and language disorders. In speech disorders, differential abilities in articulation and prosody may be identified for the various subsets of non-propositional speech, as compared with novel expressions. Such consistent differences have been reported, for example, in stuttering and apraxia. In some cases, islands of articulatory competence may be useful in the development of treatment and training methods.

In language disorders, the clinician may observe preserved non-propositional competence in the left hemisphere damaged individual, while discovering possible deficits in use and understanding of formulaic expressions in the right hemisphere-damaged patients. In the first case, formulaic language can be used as an entrée to achieving communicative function. In the right hemisphere-damaged clients, identification, counselling and remediation techniques for non-propositional language deficits may be of considerable aid to communication. In basal ganglia disorders, such as Parkinson's disease, evaluation and treatment of deficient non-propositional language usage may constitute a new approach to improving social communication in these patients.

Clinical management of children may benefit from recognizing differential production and comprehension abilities, correlating with acquisition of non-propositional and novel language. As these abilities may follow different developmental schedules, knowledge of the discrepancies can be utilized to design the most appropriate treatment plans.

Future directions

The modern study of formulaic language and understanding of its major role in human verbal competence is in its infancy. A great deal remains to be done at the

beginning states of refining techniques of identification and classification of large array of non-novel expressions in normal speech. Interest in formulaic language is challenging previously dominant linguistic models, and requiring a new formulation of an expanded role of memory in language knowledge (Harris 1994). There is a beginning field of assessing the presence of formulaic language in everyday talk, but much remains to be established about the incidence in everyday communication. Such studies of incidence in normal speech must explore the roles of topic, speaker, discourse type, dialect, language, and culture on use of formulaic language. Further work on differences between non-propositional subcategories is needed: expletives, formulas, idioms, proverbs, serial speech, collocations, pause-fillers, irreversible binomials and trinomials, and schemata may be distinguished from each other by characterizing linguistic, psycholinguistic, and neurological features.

A better understanding of formulaic expressions is needed to accomplish many goals of applied linguistics. Second language learning has benefited from acknowledgement of the special status of formulaic expressions. Idiomatic expressions have long been a stumbling block for machine translation of human language (Bar-Hillel 1953) and are presenting a similar challenge to connectionist models (Harris 1998). Other approaches could clarify maturational schedules throughout the age span. Contradictory reports about the effect of ageing on the use and understanding of various types of non-propositional expressions (idioms, proverbs, and expletives) could be pursued by studies in elderly persons. All of these approaches could benefit from a careful eye to differences between production and comprehension modalities, and whether underlying competence might be established in some domains.

Closer examination of non-propositional speech in various types of aphasia offers the possibility of better insight into correlations with brain function. Right hemisphere verbal ability remains to be investigated, pursuing hypotheses about right hemisphere involvement in non-propositional language function, with a special querying about production abilities. Changes in use of non-propositional expressions following right hemisphere damage, possibly reflecting recovery of function, should be investigated. Preserved use of speech formulas, expletives, sayings, and other non-propositional expressions in moderate and severe Alzheimer's disease is a fertile area of study. Further understanding of the role of basal ganglia in production could be investigated by examining the effect of Parkinson's disease on the processing of non-propositional language; it is possible that non-propositional usage is progressively reduced compared with propositional usage, and compared with premorbid behaviors, as the disease progresses. Some of the questions can be examined using well-established neurological investigatory techniques, such as the Wada test, brain mapping using cortical electrical stimulation as well as implanted electrodes, and electroencephalograph and evoked response studies. Many of these questions can be pursued with recently developed technologies, such as Positron Emission Tomography (PET) and functional Magnetic Resonance Imaging (fMRI) functional imaging and transcortical magnetic stimulation.

Concepts about hemispheric specialization, involving discrepant right and left hemisphere function pertinent to comprehension processes in non-propositional language, as well as the vertical axis that describes different cortical versus subcortical functions, relating primarily to motor gestures, must be invoked to describe fully the brain function underlying the integrated processing of

propositional and non-propositional language. Pursuit of these questions will aid in integrating non-propositional language processing into linguistic models of human language. A dual-process processing model, which acknowledges the importance of both kinds of language competence—compositional-propositional and holistic-non-propositional—will provide a more valid description of human language function, consonant with linguistic descriptions and psychological studies, with a firm foundation in neurological organization.

Notes

1. Cf. Pinker (1995), p. 22: 'First, virtually every sentence that a person utters or understands is a brand-new combination of words, appearing for the first time in the history of the universe'.
2. Given the nonstandardized array of nomenclature in this field (Wray 2002), in this review the terms 'non-propositional', 'formulaic', 'nonnovel' and 'fixed' are used interchangeably, as are the terms 'speech' and 'language'. For purposes here, utterances (speech) provide direct evidence of verbal ability (language). Specific types of formulaic expressions are identified by traditional labels (e.g., slang, expletives).
3. For 'dead men tell no tales' and 'birds of a feather flock together'. In the third example, a lexical substitution gives a literal twist to 'Rolling stones gather no moss'.
4. Newspaper examples cited here are from the *Chicago Tribune*, Fall (1978).
5. Apologia: many expressions given as examples may be uniquely American phrases, not familiar to other Englishes. The author hopes for sufficient commonality in formulaic expressions across varieties of English to make the ideas clear.
6. Exceptions lie in fixed expressions such as 'as a matter of fact' and coordinate constructions (also called binomial expressions, irreversible conjoined expressions, freezes, and fixed reduplicatives) such as 'cat and mouse' and 'salt and pepper', which in many usages have neither non-literal meanings nor attitudinal/affective valence (Cooper and Ross 1975, Pinker and Birdsong 1979).
7. Subjects' responses have been studied using various experimental tasks, including reaction time, lexical decision, recall and recognition, classifying into groups, judging meaning similarity, explaining meaning, rating familiarity, filling in blanks, and multiple choice of form or meaning.

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