Formulaic and novel language in a 'dual process' model of language competence

Evidence from surveys, speech samples, and schemata

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1.1 Background

My attraction to formulaic language arose not out of any neat linguistic insight, but rather from exposure to aphasic speech. When first observing speech therapy sessions in rehabilitation centers around Los Angeles, it became apparent that persons with language difficulties, even very severe ones, while struggling and failing to talk in standard ways, fluently produced certain kinds of speech with normal articulation and prosody. A literature review revealed that knowledge of preserved speech in aphasia appeared in virtually every clinical description since the mid nineteenth century, usually indexing similar phenomena with overlapping categories (Espir & Rose 1970; Goodglass & Kaplan 1972; Van Lancker 1975, 1988, 1993). While the terminology was inconsistent, the ubiquity of "automatic speech" commentary in the earlier clinical literature can hardly be exaggerated (Alajouanine 1956; Bay 1964; Benson 1979; Critchley 1970; Gloning, Gloning & Hoff 1963; Goldstein 1948; Goodglass & Mayer 1958; Head 1926; Luria 1964, 1966; Pick 1973). The categories include serial speech (such as counting), memorized expressions, sayings, nursery rhymes, familiar lyrics, prayers, clichés, yes, no, greetings and salutations, onsets of sentences ("I want, I can") as well as idiosyncratic recurrent utterances in individual patients' repertories.

The most well-known and influential of the early writers on aphasia, the neurologist John Hughlings Jackson (1874), provided vivid examples of preserved aphasic speech, and elaborated a brain model that differentiated what he termed "propositional" and "automatic" (or "nonpropositional") speech. In Jackson's formulation, these are natural human abilities associated with left and right hemisphere processing respectively, and are differentially affected by brain damage (Van Lancker 1975). The celebrated example from Baudelaire, the great French poet, who suffered a left hemisphere stroke at age 45, was well known: his only remaining utterance was "Cré nom," part of a French curse (Dieguez & Bogousslavsky 2007). Although definitions and details have evolved and changed somewhat, these ideas remain pertinent and modern today. Yet despite the resilience and accuracy of the notion that some types of speech are dramatically unaffected by brain damage causing language disturbance, none of these ideas had found their way into linguistic models of language competence (Van Lancker 1973).

2.1 Definitions and description

A considerable range of expressions can be categorized as nonpropositional, using the criterion that they are not novel – that is, they are not newly created from the operation of grammatical rules on lexical items[1] (Figure 1). These include idioms[2] proverbs, speech formulas, conventional expressions, expletives, and so on. Besides being not newly created from units (lexical and morphological elements) and rules, they have other characteristics in common: stereotyped form, conventionalized meaning, and familiarity. Stereotyped form means that formulaic expressions contain precisely specified words in a certain word order spoken on a set intonation contour. Secondly, the meanings are conventionalized, which means they are idiosyncratic in various ways, either by being nonliteral, or serving mainly as social signals, or merely by, as Wray (2002) has emphasized, communicating a meaning that is greater than the sum of their parts – the special innuendos. Take the expression, spoken by a co-ed to her friend, "I met someone." On the face of it,

1. The reader is referred to novel sentences as described by S. Pinker: '… 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' (1995: 22).

2. Corresponding terms in German in preparation for examining German aphasic speech are listed in Appendix I.

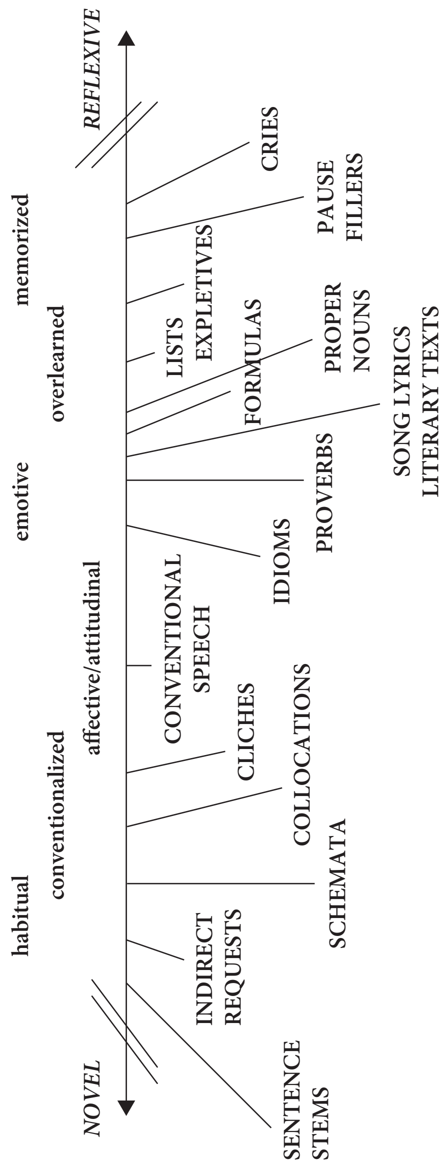


Figure 1. An heuristic continuum of nonnovel expressions.

this utterance can be declarative, literal, and informational. But as a formula it has stereotyped form, including prosodic contour (accent on met, overall declination, and distinctive light, low voice quality), and in its meaning, it has innuendos of excitement and romance, which extend over and above the words themselves. (Try this example out on a college class. Students smile on hearing the utterance. This is the "smile test" for identifying formulaic expressions.)[3]

Alongside the stereotyped form and conventionalized meaning of formulas, there is also considerable flexibility, which means that many variants can and do appear. Linguists and psycholinguists have spent much energy in trying to find generalizations underlying these variations, with many conflicting claims (Van Lancker Sidtis 2006a). One approach is to consider the formula as having a canonical form (the "formuleme"), and that any alteration conforming to grammatical possibilities in the language is possible, as long as the canonical form remains recognizable. Finally, as alluded to above and often revealed by the smile test, a key feature of formulaic expressions is their familiarity: people know them. Their status as common knowledge in a linguistic community forms part of their raison d'être.

Questions that have arisen in the course of studying formulaic language are the following:

1. How many are there? (That is, how can we figure out a way to count them?)
2. Do people know them? (That is, can we show that people know them?)
3. Are different types of formulaic expressions mentally acquired, stored, and processed differently from novel expressions, and from each other?

2.2 How many are there?

The question of how many formulaic utterances are normally used in communicative behavior engaged the interest of students at Carleton College[4] in 1998; and later at New York University. Students brought to class examples from conversations with their peers. We collated lists. As had been maintained when Chuck Fillmore engaged in a similar activity decades before at Berkeley, CA, no upper limit in numbers of formulaic expressions was seen (Fillmore 1979). Questions to ask, for example, are "How many formulas are uttered in a standard conversational interaction?" or "How many are used in the course of one day?"

3. That formulaic and novel meanings on ambiguous utterances are differently articulated and intoned can be detected from the acoustic information alone without other contextual cues by native listeners (Van Lancker, Canter, and Terbeek 1981; Van Lancker Sidtis 2003).

4. Linguistics Program, Mike Flynn, Director, Northfield, MN.

At Carleton College, we chose to investigate speech behavior in a movie. Given a chance to nominate films, some students wanted to see the most recent Mike Myers production, but a more classic film made the final cut. As a classroom activity, we purchased snacks and rented a videotape to spend an evening watching "Some like it hot" (Wilder 1959) with the charge that everyone write down any and all formulaic utterances, which were collated for a total listing and count. For a rough estimate, we divided the total number into the length of the film, and were surprised that the dialogue contained a rather high rate: four formulaic expressions per minute.[5] Later, at New York University, the published screenplay (Wilder & Dimond 1959) was discovered, allowing a more leisurely examination of the dialogue. As part of this project, methods for identifying and classifying formulaic utterances in actual usage were developed in our student research group at New York University (Van Lancker Sidtis & Rallon 2004). Again, we were surprised by the large proportion: a full quarter of the utterances fell into our formulaic categories of speech formula, idiom, proverb, and conventional expression (Figure 2a).

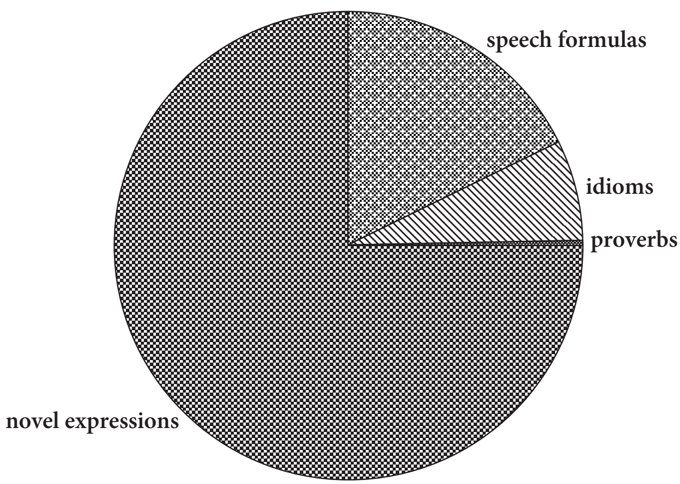


Figure 2a. Incidence of formulaic expressions in "Some like it hot."

2.3 How can we show that people know formulaic expressions?

To probe the familiarity parameter, a survey was designed, using formulaic and novel utterances randomly selected from the screenplay, to ask whether people endorse knowledge of the utterances identified by us as formulaic. In a cloze

5. More thorough analysis from the screenplay yielded 4.3 formulaic utterances per minute.

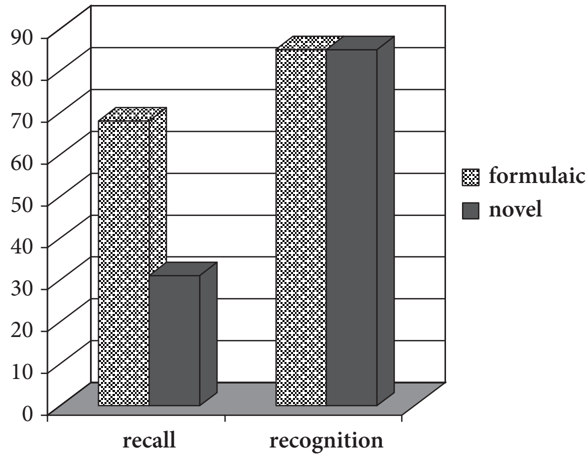


Figure 2b. Results from survey study.

procedure, in which formulaic and novel sentences were randomized in a list, subjects performed a recall task, (entering a missing word), and a recognition task (circling "F" for familiar and "N" for novel). Subjects significantly more often provided predicted words for formulaic than novel expressions, and they also recognized both formulaic and novel expressions at a high rate (Figure 2b). This indicated that most subjects knew verbatim the majority of formulaic utterances, and that they could successfully distinguish formulaic from novel utterances.

2.4 Are they processed differently? Neurological localization of automatic speech

The question of whether formulaic expressions are processed differently from novel language can be addressed by examining neurolinguistic studies. For aphasic speech, the first steps beyond anecdotal clinical descriptions of preserved utterances, so prevalent in the aphasiological literature, were taken in England by Chris Code (1982), and in Germany by Gerhard Blanken and colleagues (1991; Blanken & Marini 1997). Speech pathologists and logopedists completed surveys providing detailed information about residual speech in severely aphasic patients. The utterances were gathered and arranged into categories, which, in both English and German, included expletives, sentence stems (e.g., I want to; *ich bin*), speech formulas (all right; *natürlich*) proper nouns, and numbers. A later analysis of residual speech in Chinese aphasic persons yielded some of these same similar utterance types (Chung, Code, and Ball 2004). This study provided documentation, classification, and theoretical consideration to preserved utterances in aphasia, and highlighted the similarity of utterance-types across individual patients and languages.

Where are these utterances represented in the brain? Aphasia is associated almost exclusively[6] with left hemisphere damage in the distribution of the middle cerebral artery, which extends over most of each hemisphere, excluding only a narrow strip on the anterior frontal lobe and another narrow area on the posterior parietal lobe. With consistent reports of preserved "subsets" of speech performance across a vast range of left hemisphere lesion sites, it seemed likely, as Hughlings Jackson (1874) had maintained, that the right hemisphere was accountable. This was not a palatable notion to many people, because current opinion held the right hemisphere to be incapable of any linguistic production. If a right hemisphere substrate were accountable, then one might expect right hemisphere damage to interfere with production of formulaic expressions.

To address this question, Whitney Postman[7] and I examined written transcripts provided by Guila Glosser[8] of the spontaneous speech of patients who had suffered left or right hemisphere damage, as well as demographically matched normal-control subjects, speaking in comparable communicative settings (describing family and work). The method developed in the analysis of "Some like it hot" (SLIH) was expanded to cover nine categories: (1) idioms (e.g., "lost my train of thought"); (2) conventional expressions (e.g., "as a matter of fact"); (3) conversational formulaic expressions (e.g., "first of all," "right"); (4) expletives (e.g., "damn"); (5) sentence stems (e.g., "I guess"); (6) discourse particles (e.g., "well"), and (7) pause fillers (e.g., "uh"); (8) numerals; and (9) personally familiar proper nouns. While in SLIH we utilized a measure "proportion of total utterances," in the patient data the measure was changed to "proportion of words in formulaic expressions" compared to the total word count.[9] The results indicated that persons with left hemisphere damage use significantly more formulaic utterances, while persons with right hemisphere damage use significantly less, than normal subjects,

6. Aphasia following right hemisphere damage occurs but it is extremely rare and not well understood (Basso 2003).

7. Now at the National Institutes on Deafness and Other Communication Disorders, National Institutes of Health, Bethesda, MD.

8. Guila Glosser, Ph.D. (1951–2003), formerly at the University of Pennsylvania School of Medicine, Philadelphia, PA, tragically passed away early in the course of this project. We are grateful for her contribution.

9. Proportions of words in formulaic expressions out of the total corpus word count was utilized because a count of the total number of expressions (clauses, propositions, or sentences) is more difficult to establish in normal speech (than it was in the screenplay).

rather compellingly implicating a role of the right hemisphere in production of formulaic expressions (Figure3a) (Van Lancker Sidtis & Postman 2006).

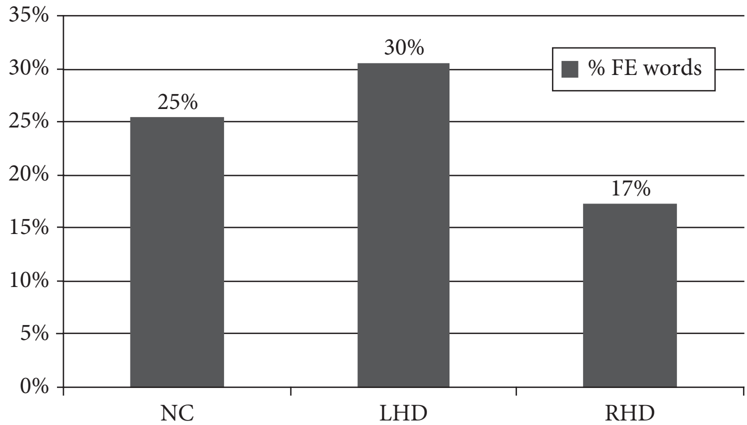


Figure 3a. Proportion of formulaic expressions in normal-control subjects, left- and right-hemisphere damaged patients.

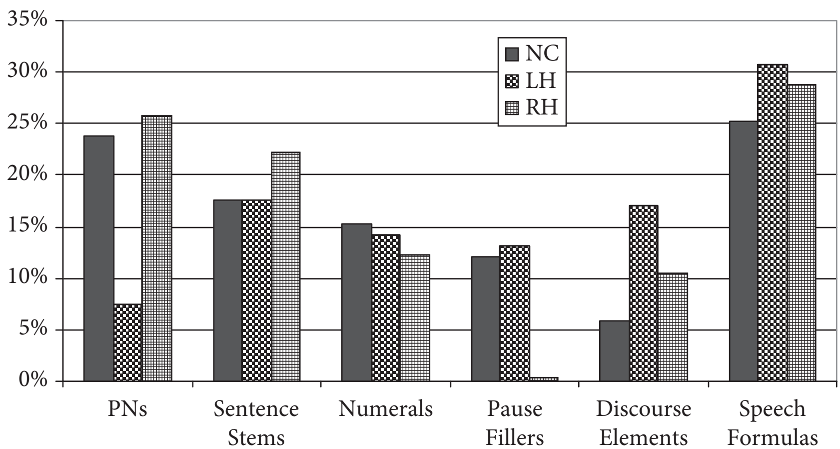


Figure 3b. Subtypes of formulaic expressions in three groups.

This conclusion was supported by the finding by Graves & Landis (1985) on mouth asymmetries in aphasic speakers, in which greater right sided openings (controlled by the left hemisphere) were measured for propositional tasks, while larger right sided mouth openings were observed for "automatic" tasks (e.g., counting).

To address a question posed earlier–whether subtypes of formulaic expressions, as distributed along the continuum in Figure 1, differ among themselves in neurological representation–counts for separate categories were examined.

Unfortunately, in this setting, subject numbers and incidence counts were too low to draw firm conclusions. A suggestive finding was that the speech samples of the right hemisphere-damaged group contained fewer speech formulas than the other groups, and contained almost no pause fillers (Figure 3b). We are cautious because this work was based on transcripts, for which the audiotaped material was no longer available, and while we believed them to be accurate, it was possible that not every "um" and "uh" had been faithfully transcribed.

The next logical step was to transcribe speech from audio and videotaped material, which could be verified whenever necessary, and to perform similar analyses of formulaic expressions. Three patients, for whom extensive radiographic materials as well as language and cognitive testing were available, were studied. Case one sustained a large right hemisphere lesion, and although language abilities were intact, his conversational speech was often pragmatically inappropriate. Case two suffered right-sided subcortical damage, and like Case one, her language abilities were normal, but pragmatic elements of conversation were abnormal. This individual complained that she no longer produced the "little words" in conversational interaction, having difficulties with greeting and leave taking. Interest in this patient was sparked by a case study by Speedie, Wertman, T'air, and Heilman (1993), describing a loss of formulaic speech production abilities following a right caudate stroke, and by previous experience with a speech disorder involving an intrusive syllable following a probable subcortical stroke. The intrusive syllable (*sis*) occurred with greater frequency during recitation, counting, and other formulaic expressions than in novel speech (Van Lancker, Bogen & Canter 1983).

The third case was a left hemisphere-damaged patient with the diagnosis of transcortical sensory aphasia (Berthier 1999; Van Lancker Sidtis 2001), who spoke fluently but with copious use of formulaic expressions. For example, when asked about his line of work, he answered "I came, I saw, I conquered." His naming response when presented with a pencil was "Reading, writing, and arithmetic." These formulaic expressions were produced with normal articulation and intonation, and considerable social confidence, such that recognition of his severe language disorder was delayed by clinical caregivers. With extensive speech samples and full background information on these three subjects, we proceeded to test hypotheses about right hemisphere and subcortical roles in production of formulaic language.

Our first concern was to develop an appropriate normal-control speech sample. Previous experience with various kinds of speech samples had revealed differences in formulaic expression usage, depending on gender of speaker, topic, and discourse setting. To provide comparable normal-control values, a structured interview similar to the contexts utilized for the three patients under investigation was designed and administered to 10 age- and education-matched normal-control subjects. (Example of transcript and analysis is provided in Figure 4.)

Figure 4. Sample of transcript for analysis of speech sample

Utterance	Fixed expressions	Sentence initials	Discourse particles	Pause fillers	Proper names	Numerals
Tell me a little about your family						
Well I was married in xxxxxxx and had xxxx boys over a span of xxxx years.	over a span of		well		xxxx	4, 20, 1941
Uh, like, xxxx's uh in Virginia.				uh, like	xxxx	
He's xxxx.		and				40
And the uh youngest one xxxx 's still at home		and		uh		
And he's twenty.						20
And uh I spent two years in the xxxx during the war				uh	xxxx	2
Uh Grew up in xxxx				uh	xxxx	
Uh and then I went to work for Shell Oil				uh	xxxx	
And I I uh moved xxxx and sa… transferred to xxxx		and		uh	xxxx, xxxx	
And then they dissolved uh the territory		and then		uh		
so I was without a job						
So uh after four years I went to work for this friend of mine who was an electrical contractor.	this friend of mine	so		uh		4

The results showed significant differences ($p < 0.05$) between the normal control group (20.1%) and each of the three patients. The subject with subcortical damage showed a frank paucity in that only 11% of words spoken belonged to formulaic expressions; the patient with extensive right-sided damage also yielded a significantly lower proportion at 16.9%, while the subject with transcortical sensory aphasia produced 51.9% in the sample analyzed. Further evaluation of proportions of individual categories in the normal and brain-damaged subjects are currently underway (Canterucci, Katsnelson & Van Lancker Sidtis 2007, in preparation).

Speech samples freshly obtained from other sources support the notion that formulaic language is amplified in aphasia. In a speech sample provided by Jacqueline Stark,[10] an aphasic subject recovered some speech over a period of five treatments from early nonfluency. On inspection, 64% of the speech sample is made up of words in formulaic expressions (below, in italics; novel expressions are underscored).

10. Dr. Stark is at the Austrian Academy for Linguistic and Communication Sciences in Vienna, Austria.

Table 1. Aphasic speech sample at baseline (Test 1) and after five treatment sessions (Test 5). Formulaic language is in bold italics and novel words and phrases are underscored

Test 1. ***Uh .*** **TV ? My** ***Monday*** **is** ***uh …*** **bank** ***uh .*** **TV** .. **my** .. ***Monday uh*** **bank**. ***hm***
Test 5: ***Uh.. uh good morning.. uh.. um..*** **me** ***uh I want a..*** **big big ter//uh terevision**, ***alright? Um,*** **big.** ***Alright? And uh..*** **money?** ***Yes. Fine.. um..*** **big and.** ***uh …*** **small** ***um..*** **TV.** ***yes.. uh*** **small** ***um.. Uh..*** **sky and cricket and.. tennis and..** ***uh*** **soccer and movies and news and..** ***alright? Um.. right. Uh..*** **where?** ***Ah! Alright! Boah! nice! Wow!*** **Big! And small!** ***Ho-ho, Jesus! Uh..*** **price? What? two thousand..** ***oh Jesus! hm.. wait. um.. hm hm hm. yes. alright.. um.. I. will uh …*** **I will phone and** ***uh.. uh.*** **woman,** ***yes? And uh um..*** **wife,** ***yes. Um.. maybe alright.. maybe uh.*** **two thousand?** ***Oh, Jesus. Alright. Uh*** **phone and wait,** ***alright? Uh.. oh, Jesus! Hi! Jane um.. phew.. uh.. what is the matter?*** **Money?** ***Oh, Jesus.. alright.. alright! thank you! see you! Uh*** **salesman..** ***uh.. money, yes.. fine..***

Another example, showing speech from a German aphasic patient before treatment, was provided by Caterina Breitenstein,[11] who has developed a protocol for intensive speech rehabilitation (Schomacher, Baumgärtner, Winter et al. 2006). Dr. Breitenstein trains subjects in naming and in specific propositional statements useful in activities of daily living. In the initial sample below using the ANELT language evaluation protocol, taken at the baseline condition, nearly all the speech product consists of formulaic language (Blomert, Kean, Koster, and Schokker 1994). A question of interest is this: when propositional speech abilities improve following the intensive training sessions, will formulaic expressions also increase? Studies to answer this question are currently underway.

Table 2. German aphasic speech. Formulaic language is in bold italics and novel words and phrases are underscored (T = Therapist, P = Patient). English translation in italics

T:	Bevor wir anfangen, machen wir einfach mal zwei Übungsbeispiele, ja? *(Before we begin, let's simply do two practice examples, okay?)*
P:	***Ja.*** *(Yes.)*
T:	Also, Sie sind bei einem neuen Friseur. *(Okay. You are at a new hair salon.)*
P:	***Ah Gott ja.*** *(Oh heavens yes.)*
T:	Und sie sind an der Reihe. *(And it is your turn.)*
P:	***Ja.*** *(Okay.)*

(Continued)

11. Dr. Breitenstein directs aphasia research in the Neurology Department at the University of Münster, Germany.

Table 2. *Continued*

T:	Ich bin der Friseur. *(I am the stylist.)*
P:	***Ja.*** *(Okay.)*
T:	Was sagen sie zu mir? *(What do you say to me?)*
P:	***Hallo, wie geht's? Danke, gut, tja. ja,*** **und?** *(Hello, how are you? Thank you, good, okay, yeah, and now?)*
T:	Was sagen sie noch? *(What else do you say?)*
P:	***Äh,*** **Haare waschen?Und, rot**, ***ja, ja, och,ja.*** *(Uh, wash hair? And, red, yeah, yeah, oh, yeah.)*
T:	Noch etwas? *(Anything else?)*
P:	***Nö, äh, ach Gott,*** **und**, ***ein, ehm,*** **und** ***und äh,*** **und und, Geld**, ***nö,*** ***das ist so gut, das ist, das*** w.. *(Nope, um, oh God, and, a, um, and and, um, and and, money, nope,* *that's just fine, that's, that)*
T:	Okay, aber es ist richtig. Sie stellen sich vor, *(Okay, but it is correct to introduce yourself.)*
P:	***Ja.*** *(Yes.)*
T:	Was wäre wenn, *(What would it be when…)*
P:	***Ja, sehr gut*** *(Okay, very good.)*

2.5 Other speech production studies

In one of the few studies comparing formulaic with novel expressions in speech production,[12] propositional and nonpropositional tasks were matched and evaluated in aphasic subjects (Lum & Ellis 1994). Counting was compared to number identification; responsive naming of pictures using cues from formulaic expressions (e.g., "Don't beat around the BUSH") was matched with responsive naming using novel expression cues ("Don't dig behind the BUSH"); and repetition of formulaic expressions was paired with repetition of novel expressions. Better

12. Studies of comprehension in normal and clinical subjects are more common than production studies; many of these identify the right hemisphere as playing a significant role in various kinds of formulaic language processing, such as idioms and indirect requests (Van Lancker Sidtis 2006b; Weylman, Brownell, Roman & Gardner 1989; Myers 1998).

performance on nonpropositional tasks for number production and picture naming but not for phrase repetition was found. This can be explained by the notion that the novel-formulaic distinction pertains to spontaneous processing, and is nullified when a model or template is provided, as in repetition. Van Lancker & Bella (1996) reported similar results in aphasic subjects comparing matched propositional and nonpropositional expressions, with better nonpropositional ability for sentence completion than repetition. Interestingly, careful phonetic analysis of the contrasting repetition tasks did not reveal differences in articulatory skill between the two tasks. This suggested, again, that the mechanisms differentiating propositional and nonpropositional speech modes belong to the spontaneous mode (Van Lancker Sidtis, Ahn, and Yang 2007, in preparation).

Neuroimaging results for speech production related to formulaic expressions of different types have appeared. Early studies using SPECT technology reported bilateral representation of automatic speech tasks (Ryding, Bradvik & Ingvar 1987; Larsen, Skinhøj, and Lassen 1978), but the meaning of these findings is overshadowed by subsequent studies that have reported bilateral brain signals for most language tasks (Van Lancker Sidtis 2006a). Results from imaging studies are not any more consistent for automatic speech than they are for other language tasks.

In one study (Van Lancker, McIntosh & Grafton 2003), five aphasic patients who had suffered a single, unilateral stroke in the perisylvian region were compared to nine right-handed, age- and education-matched normal-control subjects. Tasks were three sets of 90-second activation sessions producing (1) animal names, (2) vocalized syllables, and (3) counting. As expected, behavioral measures differed significantly between normal-controls and patients for generation of animal names, but not for vocalizations or counting. In the normal-control group, greater left frontal activation was identified for naming and nonverbal vocalization, while more RH and basal ganglia areas were identified for counting. For aphasic subjects, naming and nonverbal vocalization were associated with relatively more diffuse and bilateral structures, and counting did not yield a significant brain profile. These results suggested that counting is not strongly lateralized to the left hemisphere as is naming, but caution due to the uncertain meanings of imaging signals must be taken. In an interesting measure of spoken discourse elements, Postman et al. (2007), using a naming task in an functional MRI paradigm, reported right frontal activation during wrong responses, which usually involved an expletive or other formulaic expression. A related study using PET imaging showed a correlation between pause fillers and other marks of dysfluency (“inclusions”) and hemispheric side of activation, with more left hemisphere activation in cases of low inclusions (Postman et al. 2006).

Inconsistencies also arise from these studies of formulaic language. A 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 Pledge of Allegiance) compared to tongue movements and consonant-vowel syllable production (Bookheimer, Zeffiro, Blaxton, Gaillard, and Theodore 2000). Continuous production of the Pledge of Allegiance showed activation in traditional language areas, while 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 behavior most frequently preserved in aphasia. In a preliminary report using PET imaging, differences in brain activation patterns for counting compared with storytelling were described (Blank, Scott, and Wise 2001). A later report addressing the same question indicated extensive bilateral activation for propositional and nonpropositional tasks alike, with no differences in brain sites between speech modes (Blank, Scott, Murphy, Warburton, and Wise 2002). These inconsistencies, again, can be attributed to problems in brain imaging methodology, whereby the meaning of the activation signals is not well understood (Sidtis 2007).

3.1 Summary of neurolinguistic studies: The dual process model

The dual processing model posits that, as is already well known, language is represented in the left hemisphere, and proposes further that formulaic expressions are facilitated by a subcortical-right hemisphere circuit. An implication of subcortical structures in formulaic control arises from several sources: single case studies, speech disorders in subcortical disease, and behavioral functions of subcortical nuclei. Single cases of loss of formulaic language following basal ganglia damage due to stroke have been reviewed above. Swearing and other (taboo) formulaic expressions are hyperactivated in Tourette's disease (Van Lancker & Cummings 1999), which is associated with subcortical dysfunction. In some patients, stimulation of thalamic areas in stereotaxic surgery for treatment of motor disorders elicited recurrent utterances (Petrovici 1980) or "compulsory speech," described as "exclamations… utterances of surprise, fright, or pain," counting, or vocal gestures such as the sound of a shepherd used to collect sheep (Schaltenbrand 1975: 71–3). In one patient, the formulaic expression "thank you" was elicited repeatedly by stimulation of a particular site (Schaltenbrand 1965).[13] Subcortical nuclei (basal ganglia) store and mediate complex motor programs (Marsden 1982), which include vocal motor gestures. Neurological disorders involving these structures could contribute to abnormal diminution or activation of formulaic expressions.

13. It is difficult to assess the possible formulaic status of other reported utterances elicited during thalamic stimulation, because only English translations are given in the published material.

A spotlight is shone on the right hemisphere as playing a key role in formulaic language for several reasons. Propositional speech (grammatical utterances, naming, information-bearing sentences) is disturbed by damage in many areas of the left hemisphere, often preserving production of formulaic expressions. It is reasonable to infer that the right hemisphere supports these expressions. The notion is further supported by the postoperative speech of a normally developing adult whose left hemisphere was removed in medical treatment, presenting discourse markers (well, oh), pause fillers (uh, um), sentence stems (I want), and expletives (God damn it), all produced with normal articulation and prosody, but no other language (Smith 1966; Van Lancker Sidtis 2004). Furthermore, well-established characteristics of the right hemisphere are compatible with a special role for processing formulaic language (Myers 1998; Van Lancker 1997). Favored are patterns, configurations, and whole complex Gestalts, with more efficient processing of the overall form and content than details or features (Kaplan, Brownell, Jacobs, and Gardner 1990). In communication, contextual meanings are better processed than analytic, linguistic meaning relations. Successful processing of theme and topic as properties of discourse units also requires an intact right hemisphere. An important aspect of many formulaic expressions involves appropriate linguistic and social context. For example "It's a small world" requires a constellation of conditions including chance meeting of acquaintances in an unlikely setting, along with connotations of surprise and so on. This kind of thematic, contextual material has been shown to be preferentially processed by the right hemisphere (Van Lancker 1997; Myers 1998). Finally, establishment of familiarity (personal relevance) appears to be the province of the right hemisphere (Van Lancker 1991).

3.2 Dual process model and schemata

Evidence for a dual process model of language processing comes from several sources, the most compelling of which is neurolinguistic. The implications of these studies are that novel and formulaic language are affected differently by different types of brain damage: left hemisphere damage leads to selective impairment of novel language (with relative preservation of formulaic language), while right hemisphere and/or subcortical damage lead to selective impairment of formulaic language (sparing novel language). Neurological damage can disturb, diminish or enhance behaviors involving formulaic language. Enhancements in formulaic language use are seen in aphasia, Tourette's syndrome, autism, Down's syndrome, and Alzheimer's disease, while diminution is observed in right hemisphere and subcortical disease. It is likely that more such differences will be documented as information about formulaic language is disseminated into clinical practice.

Recognition of the important role of formulaic expressions in evaluation and recovery in aphasia and other neurological disorders has barely begun, despite the "automatic speech" tradition extending more than a hundred years into the past.

The notion of two such processing modes has emerged from studies of learning and memory, comparing, for example, procedural and declarative knowledge (Mishkin, Malamut & Bachevalier 1984). Subcortical structures have been associated with "chunking of action repertoires" (Graybiel 1998) or "habit learning" (Knowlton, Mangels, and Squire 1996). These perspectives have been aligned with hierarchical levels of the central nervous system, such that automated motor gestures are accommodated by subcortical structures, which developed phylogenetically earlier in human evolution (Koestler 1967). Correspondingly, it has been suggested that the origin of human language might be located in initial use of formulaic expressions (see Figure 5 for a whimsical example) (Jaynes 1976; Code 2005; Wray 1998, 2000; Wray & Grace 2007).

Figure 5. Formulaic expressions may have played a role in human language origins.

Another provocative source that supports the dual-process model arises from developmental language studies, in infants' first and in adult second language acquisition. Researchers in child language document acquisition of holistic "chunks" of speech which evolve into compositional structures (Peters 1983; Lieven 2007; Tomasello 2003). While unitary utterances are utilized by children early on, acquisition of formulaic expressions at adult levels lags behind acquisition of grammatical competence (Kempler, Van Lancker, Marchman, and Bates 1999). This suggests that the two processes, holistic and analytic, perform different roles at different stages of language acquisition, and, further, that different maturational schedules are in play for novel versus formulaic language knowledge. Similarly, in adult second language acquisition, the difficulty posed by formulaic expressions is well known. It is likely that critical periods for native-like acquisition exist for various types of language competences, including for acquisition of formulaic expressions.

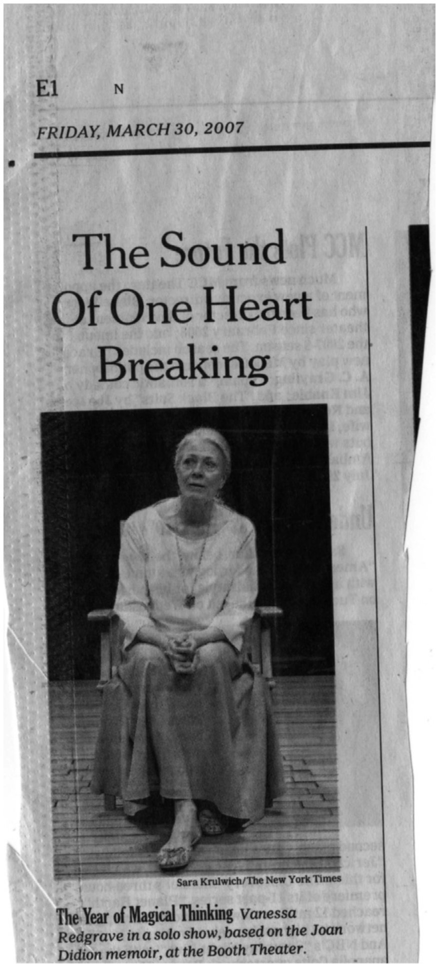
Another important source of evidence for the dual-process view is linguistic. As described above, the formulaic phrase has unique properties: it is cohesive and unitary in structure (sometimes with aberrant grammatical form), often nonliteral or deviant in meaning properties, and usually contains a nuanced meaning that transcends the sum of its (lexical) parts. The canonical form of the expression ("formuleme") is known to native speakers. This is to say that a formulaic expression functions differently in form, meaning and use from a matched literal, novel, or propositional expression (Lounsbury 1963). "It broke the ice," for example, as a formula, differs regarding meaning representation, exploitation of lexical items, status in language memory,[14] and range of possible usages, when compared to the exact same sequence of words as a novel expression.

3.3 Comparison of formulaic expressions with schemata

A primary property of formulaic expressions is their cohesion or unitary structure. This has led to their characterization as lexical units. However, considerable flexibility has also been described (Sprenger 2003), such that morphemes and words can be inserted and grammatical rules applied under various circumstances, as in "She had him totally eating right out of her hand," or, to tersely describe a grisly death scene, "The bucket was certainly kicked here." The formulaic unit can be alluded to by mentioning only a portion, as in "I wouldn't want to be counting chickens…"[15] Changes can be applied to formulemes in humor, word games, or other kinds of language play, so long as their canonical shape remains recognizable. In Figure 6, two words are replaced in part of an utterance that alludes to a well-known Zen koan or philosophical riddle, "What is the sound of one hand clapping?" and thereby drawing on the nuances of mystery and intensity inherent in that saying.

14. The unique states of formulaic expressions in memory storage accounts for the "idiom effect" seen in word association studies (Clark 1970).

15. Also observed in field studies: "Besides the small world thing,…" and "All that stuff you see…is just frosting on that basic cake."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FRIDAY, MARCH 30, 2007

The Sound Of One Heart Breaking

Sara Krulwich/The New York Times

The Year of Magical Thinking *Vanessa Redgrave in a solo show, based on the Joan Didion memoir, at the Booth Theater.*

Figure 6. Example of lexical replacement in formulaic expression ("What is the sound of one hand clapping?") (The New York Times).

One approach to modeling the structural properties of novel and formulaic language is to view expression-types as occurring at two extremes, from fixed, in which the underlying formuleme is known, and novel, where word choices are dependent on grammatical constraints only. An intermediate type of expression is the schema (Lyons 1968: 177–8).[16]

16. The internet site www.languagehat.com describes a similar phenomenon using the term "snowclones," which include formulaic expressions and schemata used in journalistic writing and speeches. See also Wray 2000.

A schema is a fixed form with one or more free open slots. Schemata carry the characteristics of formulaic expressions in having a basic canonical form (with distinctive intonation contour and voice quality), utilizing specialized meanings, conveying nuances, and being known, but they have an additional versatility (See Appendix II for a sample list). Examples are "That was a _____ and a half," and "If you had my _____, you'd be _____, too." A preliminary collection of 209 schemata reveals a range of word-count lengths from 1–19 words, with a mean utterance length of 4.74 words (Figure 7), and a mean of 1.25 open slots.

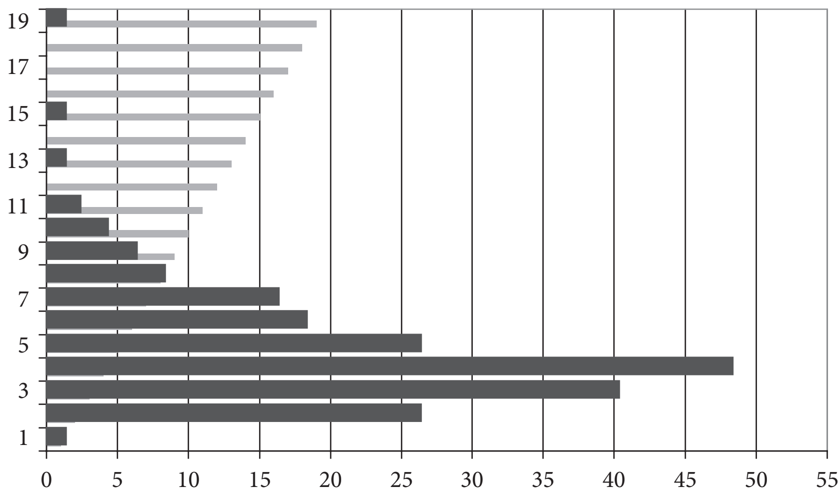

Figure 7. Schemata word count per expression is represented on the Y axis, and frequency on the X axis.

In schemata, two processing modes, novel and formulaic, are creatively interactive. A known unitary form, a formulaic expression, allows specific flexibility in accommodating novel expression. Here "the best of both worlds" is in play. Schemata

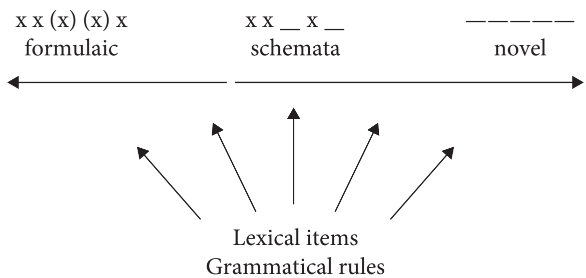

Figure 8. Structural status of formulaic, schematic, & novel utterances: Morphophonemic & movement rules, lexical insertion.

vividly illustrate the dual process in linguistic performance, in which two distinct modes, analytic and holistic, coexist in continuous interplay. It is the claim of the dual-process model that two different modes of language processing can be seen in child language acquisition, differential effects of neurological damage, psycholinguistic studies, and everyday language use. These concepts have relevance for theoretical and practical models of language behavior.

Appendices

Appendix I. Some categories of formulaic language with German counterparts.

1. Idioms: light at the end of the tunnel.
   Wendungen: Licht am Ende des Tunnels.
2. Proverbs: Rome wasn't built in a day.
   Sprichwörter: Rom wurde auch nicht in einem Tag erbaut.
3. Slang: Awesome, cool
   Umgangsprache: Geil, cool.
4. Conventional expressions (various types): What luck, in the meantime, more or less, as I was saying
   Formeln: Glück im Unglück, sozusagen, mehr oder minder, Wie gesagt,
5. Speech formulas: How are you? See you later.
   Floskeln: Guck mal an. Tschüss.
6. Indirect requests: It's getting late. Isn't it kind of warm in here?
   Indirekte Forderungen: Es wird spät. Es ist hier so warm oder bin ich das?
7. Expletives: Good heavens, jumpin' Jimminy.
   Schimpfwörter: Donnerwetter, Um Gottes Willen.
8. Sentence stems: I'd like you to meet…, I want
   Satzanfänge: Ich möchte..,
9. Memorized expressions: Prayers, rhymes, songs
   Auswendig gelernte Ausdrücke: Gebete, Lieder
10. Serial speech: numbers, alphabet
    Seriensprache: Zählen, Alphabet
11. Pause fillers: well, ya know
    Pausenfüller: also, wissen Sie
12. Familiar proper nouns: George W. Bush.
    Eigenname: Gerhard Schröder
13. Discourse markers: uh, um
    Füllworter, Füllsel, Verzögerungswörter: äh

Appendix II. Selected schemata

1. ____ and counting
2. ____ to end all ____
3. A _____ does not a _____ make.
4. A ___ without____ is like a _____ without ____
5. A _____'s ____ (word repeated)
6. A walking____
7. A whole nother ____
8. Do I look like a ____ ?
9. Down with _____
10. Goodbye ____, hello _____
11. Have enough _____ there?
12. He is too ____ by half
13. How _____ is that?
14. I (he) eat(s) and breathe(s) _____
15. I can do ____ with one hand tied behind my back.
16. I eat _____ for breakfast.
17. I know ____ like the back of my hand.
18. I may not know anything about ____, but I know what I like.
19. I wouldn't be caught dead _____
20. I wouldn't give you _____ for his ____
21. If you had his/my _____, you'd be ____(-ing) too.
22. I'll give you a ____
23. I'm all ____ed out.
24. I'm not a big ____ person
25. It was (a)____ from hell.
26. It's not just about (the) ____; it's about (the) ____
27. It's nothing if not _____
28. It's(he's, she's) a little too _____ by half
29. Leave the ____ at home
30. Make like a _____ and ____.
31. mother of all ____
32. Move over, _____.
33. My middle name is _____
34. None of this ____ business
35. now that's a _____
36. Shut up and ____
37. So you think you can ____
38. Some of my best friends are ____
39. That was a _____ and a half
40. That was voted the most _____
41. The____ are taking over.

42. Those wacky ____
43. To think I was once (a) ____
44. Using the _____ word
45. Wadda I look like, a ____ ?
46. We know _____ when we hear (see) it
47. What if _____ is what it's all about?
48. What part of _____ don't you understand?
49. What's up with _____
50. When _____ is not enough
51. You (I) must have been absent when they handed out the ____
52. You call that a ____?
53. You can say hello to_____, goodbye to ____
54. You can take (your)_____ and shove it.
55. You can take the ___ out of the ___, but you can't take the ___ out of the ___.
56. You've got to love the ____
57. You've seen one ____, you've seen them all.

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Abstract

The fact that formulaic expressions are consistently preserved in left hemisphere damage has had little influence on models of language. Evidence from disordered speech, linguistic analyses, and first and second language learning reveals that formulaic and novel expressions pattern differently. The "formuleme" (canonical form) is recognizable by native speakers as having stereotyped form and conventional meaning. Studies suggest that one quarter of discourse is made up of formulaic expressions, and that right hemisphere and subcortical damage interfere with their comprehension and production. The dual process model features a holistic mode for processing of formulaic language and an analytic mode for generation of new utterances. Schemata (formulemes with open slots) exemplify normal cooperation between generation of fixed and newly created language.