



PERGAMON

Language & Communication 18 (1998) 47-67

LANGUAGE
&
COMMUNICATION

Protolanguage as a holistic system for social interaction

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1. Introduction

Much of the recent work on protolanguage has assumed that it contained a limited number of referential words in short sequences. However, there are good reasons for considering the possibility that it consisted of holistic utterances which performed two types of interpersonal function: 'grooming' (Dunbar, 1996) and inciting desired behaviour in others. Holistic sequences are used today to accomplish these goals, as well as providing a general text base within which novel, generated utterances are embedded. In this paper it will be proposed that when analytic (generative) language became available, segmentation of these holistic utterances began, but that the human short term memory capacity proved inadequate to resource its full capabilities. As a result, holistic units were, and continue to be, used for their original functions as a way of maximising the processing space available for the novel referential and descriptive creativity that is unique to analytic language.

2. Grammar or no grammar?

Most recent commentaries on the nature of protolanguage have taken for granted that it consisted of a limited set of words (e.g. Mithen, 1996, p. 186; King, 1996, p. 196; Bickerton, 1996, p. 51 and forthcoming; and implicit in Lieberman, 1991, p. 59), which were strung together in some sort of grammar (e.g. Carstairs-McCarthy, forthcoming), perhaps in a way reminiscent of, or identical to, early child language, human language used by apes, and/or pidgin languages (Bickerton, 1996). The items are normally identified as being referential, essentially names for things and simple actions (King, 1994, p. 108; Armstrong et al., 1995; Studdert-Kennedy, forthcoming; Bickerton, forthcoming). This is problematic, however. Firstly, it is not clear where these referential words would have come from—one is reminded of Max Müller's *bow-wow*, *pooh-pooh*, *ding-dong* and *yo-he-ho* theories. Secondly, there is a critical

level of complexity that must obtain for a creative grammar to be useful in expressing propositions. Bickerton (forthcoming) points out, for example, that a grammar that had no inherent marking of participant roles, whether through case or word order, would run into severe problems with multiple ambiguity once there were two or more arguments to a verb¹.

Most importantly, it is difficult to imagine what advantage a primitive, half-way grammar would have for its users, over the highly successful interactional systems of other primates (and therefore presumably the precursors of modern humans) that rely on holistic noise and gesture to express the wide range of functions necessary for day to day communal living—greetings, requests, threats, information sharing, etc. (Reiss, 1989). Bickerton (forthcoming) argues that in linguistic impairment, primitive cultures, child language and elsewhere 'we find protolanguage and between protolanguage and language we find nothing' (1996, p. 71). In this he concurs with Chomsky (1972): 'it seems rather pointless ... to speculate about the origin of human language from simpler systems... There seems to be no substance to the view that human language is simply a more complex instance of something to be found elsewhere in the animal kingdom' (p. 70). Continuity theorists (e.g. King, 1996) disagree, arguing that precursors of syntax exist in primitive communication, and are only invisible to those who define 'syntax' exclusively in terms of the full human system.

If protolanguage did not feature a primitive grammar, however, it must have featured no grammar at all. This is Bickerton's position: 'in production, information would travel downstream from conceptual structure to phonetic representation to motor control, with no mechanism for imposing any formal structure on the sequential linking of individual words' (Bickerton, forthcoming). However, this simply does not work, as Bickerton's subsequent discussion demonstrates, because his objection to *half* a grammar, that it would not be viable in its own right, applies equally well to *no* grammar: it is impossible to have a grammarless sequence of words that is both novel and conveys a consistently retrievable meaning. How would the hearer ever understand it?² Successful linguistic *comprehension* requires grammar, even if the *production* were to be grammarless. A language that lacks sufficient

¹ Actually, he goes much further, apparently imposing on protolanguage the categories, requirements and restrictions of full human language. This seems rather like insisting that two kids kicking a football back and forth in the park must be being bound by the off-side rule—but it illustrates how difficult it is to imagine how else language could be (Carstairs-McCarthy, forthcoming). To believe that UG governs even a communication system that is not using it, seems to entail seeing it as existing independently of the way humans are wired for language, rather than being a product of that wiring. That would give it the same status as a law of physics, or perhaps equate it with some people's view of morality—there waiting for us to reach the point where it becomes relevant to us.

² Bickerton would point, as counter-evidence, to 'protolanguage' today (in the child, ape, language deprived adult and pidgin speaker), but for this, it needs to be demonstrated that these are actually communication systems between users, rather than between one 'protolanguage' user and one user of full human language. Do children or apes use their 'protolanguage' to communicate successfully with *each other*? Can it be demonstrated convincingly that a pidgin user in hearer mode uses *only* the pidgin to access the meaning, rather than drawing on knowledge of his/her grammar-anchored native language?

lexical items and grammatical relations can only hint at explicit meaning, once more than one word at a time is involved. In a protolanguage so constructed, the items *stone*, *hot* and *food* might be arranged in any order and mean any of: *the stone is near the hot food*, *take the hot food to the stone*; *put the food on the hot stone*; *the person with the hot food should sit by the stone*; *take the stone and then the hot food*; *use the stone to heat the food*; *when I sat on the stone I found the food was hot*; *if you put the food on the stone it will get hot* etc., besides the pragmatically less plausible but logically possible *treat the hot stone as food*; *hit the food with the stone until it is hot*; *make yourself hot by throwing stones at the food...* etc.

If you cannot convey what you mean by *food stone hot* without also physically demonstrating what you want done or what you have experienced, then you might as well just do the latter and forget the talking altogether. To make the language useful, it must be able to reliably convey a message from speaker to hearer in its own right. There are two ways of achieving this. One is to introduce some principle that foregrounds one interpretation over the others, *such as whichever word comes first is the topic* or *whichever word comes last is the object of the action*. This is grammar, so the system is not grammarless. The other way to achieve successful communication is to come to a consensus that a certain sequence of words conveys a certain meaning, and no other meanings should be considered for that specific sequence. Thus, it might be agreed that *stone hot food* will always mean *put the food on the hot stone* and *hot stone food* will always mean *the person with the hot food should sit by the stone*. It does not matter which meaning goes with which word-order sequence, provided everyone knows, and, of course, it doesn't even matter, ultimately whether the individual words have anything to do with the whole message: if *hot stone food* comes to mean *the most important person should sit in the elevated position* and later even *I should sleep at the front of the cave*, there is no consequence, because the word-sequence takes its meaning from the whole, not from the sum of its parts. The parts are, in fact, not words at all, just components of the utterance, in the same way as the items *by*, *and* and *large* are not in any useful sense separate words in the phrase *by and large*. This is a significant observation because it demonstrates the way in which having *no* grammar must also mean having no component words and also having no novelty that can be spontaneously understood by others. It follows that if we are seeking a language without grammar, we should not start with words, but with holistic utterances with an agreed meaning.

A language with no grammar may have no need of words, but it does need utterances and these, therefore, must have come first (cf. Locke, forthcoming). The communication systems of primates provide clear indications that utterances are by far the older unit of exchange. Reiss (1989) notes that chimpanzees use vocal noises and gestures in ways equivalent to human assertives (e.g. to inform about the location of food), commissives (to threaten, offer, etc.), directives (to get others to do something, such as give food, groom, etc.) and expressives (to greet). These signals convey a complete message and are, of course, holistic, in having no internal morphological structure. The only example that has been brought forth as evidence of *words* in a primate species is the separate danger calls of vervet monkeys (Seyfarth et al., 1980). However, whatever these are glossed to 'mean', it is quite clear that they

are complete utterances with a function, namely to warn. There are not to my knowledge any examples of vervets sitting around making eagle noises for the purpose of education or reminiscence. To make the sound is to utter a warning, and the most accurate glosses must therefore be *Beware of the eagle!* *Beware of the cat!* and *Beware of the snake!* In making this observation there is no undermining of Seyfarth et al.'s (1980) basic claim that the cries are discrete, but they are discrete *messages*, not discrete *words*.

If one assumes, as seems reasonable, that the precursors of modern man existed in social groups similar to those of primates (Dunbar, 1996), and with a similar or greater intelligence and memory capacity, then protolanguage came into being either because of or in spite of a successful, if limited, system of vocalisations and gestures that already oiled the social wheels and achieved a number of specific interactional goals. As demonstrated above, a protolanguage based around *words* would have been a poor substitute for this, and not much of a supplement to it either, so it is not clear what advantages it would have afforded, especially in the light of some of the survival *disadvantages* that accompanied the development of language, such as the changes in the vocal tract (Lieberman, 1991, p. 53ff).

However, if one imagines that protolanguage developed *out* of the older holistic communication system, retaining all of its advantages and adding some new ones—particularly a radical increase in the number of possible utterances, and the potential for displaced reference—then the transition from no language to protolanguage can be envisaged to have been smooth, gradual and beneficial. Protolanguage would have been well suited to its purpose and therefore stable over perhaps a million years. A protolanguage based on holistic utterances provides a useful solution to a problem with Dunbar's (1996) account. He sees the original purpose of language as a replacement for physical grooming. All that is actually needed for this is chatter, with some rudimentary meanings attached—see also Locke's (forthcoming) 'talking' as opposed to 'speaking'. However, Dunbar also proposes that language was a way of exchanging information about third parties (gossip), so that the individuals were able to enhance their knowledge of the group members beyond the scope of their own first hand experience. The difficulty with this is the jump from the 'grooming' aspect, which is a clear and plausible development of primate social behaviour, to novel information exchange, which is a link-feature to our language behaviour today. Between these lies the gulf represented by questions like: where did words come from? how did the grammar become established? The account proposed here bridges this gap exactly, providing continuity from primate communication to the patterns of our language use today. Furthermore it provides an explanation for why the linguistic expression of certain social interactional functions in modern human language takes the form it does.

3. Holistic protolanguage

Primates use vocal and gestural signals to achieve specific interactional goals. These goals relate to self-preservation, the preservation of others and the servicing

of and adjustment of relationships, and so the signals are requests, threats, warnings, acknowledgements, etc. (Reiss, 1989). The signals are thus functional; they are intended to have an effect upon the world of the speaker and/or hearer, by inciting a reaction in the latter. The signals are holistic: there are no component parts that could be recombined to create a new message.

Imagine early hominids communicating in a similar way but capable of a more complex inventory of functional exchanges and thus needing a larger set of utterances. Whereas a primate community might be content with a signal that meant *give (me what you have)*, early hominids might have had a use for several signals, such as *give me the meat*; *give me the child*; *give us the meat*; *give me some of the meat*; *give her the meat*, etc. (see later discussion in footnote 7 for some comments on using pronouns in these translations). With no component units of meaning to combine to produce these, each utterance would need to be auditorily distinct, and one way of achieving this would be to employ the sounds of the vocal tract as a raw material for the construction of the signals. A transition from 'noise' and gesture to phonetic sequences could occur gradually, in a context in which '*talking* would have constituted a social and physical frame capable of accommodating constituent gestures and units of meaning' (Locke, forthcoming). Studdert-Kennedy (forthcoming) sees this as a major point of transition from animal communication to human language. The time-frame for these changes might be the 1.5 million to 0.5 million years BP span of *homo erectus* (Stringer and McKie, 1996, p. 92), something that need not be incompatible with the later branching of Neanderthal, as they may have undergone a reversal of earlier modifications (*ibid.*, p. 93) or else had a vocal tract similar to our own (p. 196). Gradual changes in the vocal tract would make more sounds available, so an increasing number of discrete utterances could be created.

Each utterance would be kept separate from others by contrasts that we might term 'phonemic', so, for example, /mabu/ might carry the meaning *keep away* while /madu/ meant *take the stick*. Protolanguage would, then, be a phonetically sophisticated set of formulaic utterances, with agreed function-specific meanings, that were a direct development from the earlier noises and gestures, and which had, like them, no internal structure. Each would be phonetically arbitrary, unrelated in sound to even those utterances that meant similar things. The utterance that we might translate as *give her the food* could be, say, /mɛbita/ and that for *give me the food* /ika-tube/. The utterances would perform the same functions as in primates, expressing and negotiating relationships, and inviting specific actions from others (compare Halliday's 1970 *interpersonal function*). There would be no reference or description for its own sake (*this is a tree*; *the tree is tall*); that is, no *ideational function* in Halliday's (1970) terms. This is something, I suggest, that developed only with full human language.

For such a system to work, each individual would have to be able to memorise, without the help of any grammatical or lexical clues, the form and meaning of each utterance. This may seem like an unreasonable burden, placing 'a prohibitive tax on a creative phonetic invention and memory' (Studdert-Kennedy, forthcoming). However, the scenario is more plausible that it first appears. Firstly,

unless we think that the users of protolanguage had a memory much poorer than our own, why should we consider the memorising of /mɛbita/ and /ikatubɛ/ for *give her the food* and *give me the food* any more problematic than remembering /haudujudu/ for *I politely acknowledge the event of our initial meeting* or /stikəraun/ for *kindly remain in the vicinity (informal)*? Modern humans show no indication of lacking space for as many lexical items and phrases as they choose to memorise, including those of foreign languages (Ellis, 1997, p. 45). Secondly, a communication system that uses utterances only for a limited set of interactional functions need not be all that large. Even if each utterance is unique, with no principled resemblance to any other, there is a relatively small set required: those for common commands, basic greetings, requests, threats and so on (see also footnote 7). You do not need an utterance that means *the world looks lovely tonight* or *I wonder if it will rain tomorrow* or *it wasn't like that in my day*. Nevertheless, both memory and the sound system would certainly have been under some strain. Indeed, as the demands on the phonetic inventory would have been greater in protolanguage than in full human language, we see a motivation for the development of the human vocal tract to a point where it can produce substantially more phonetic differentiations than we need today, now that we have a system of smaller units that are multiply combinable. The motivation for the development of the human vocal tract is a puzzle that has exercised a number of researchers recently (e.g. Lieberman, 1991, p. 60ff; Bickerton, forthcoming; Locke, forthcoming; Studdert-Kennedy, forthcoming; Carstairs-McCarthy, forthcoming).

One might wonder how utterances that were phonetically arbitrary could become established, and how everyone would know what they meant. This, however, is no more of a mystery than it is that we today can learn the inventory of arbitrary morphemes and also of words and phrases whose internal composition is uninformative, such as *ladybird*; *how do you do*; *do me a favour* (in the sense of *what you are saying is ridiculous*). Simply, a sequence would be coined by someone and if it was sufficiently useful and its users had sufficient status to be imitated, it would be adopted by others. Those hearing it for the first time could surmise its meaning using pragmatics and contextual clues, just as we do when we hear a new word. Protolanguage might, additionally, have offered supportive visual cues such as gesture. What it would not, of course, have provided, is any grammatical context to draw on, for each utterance would have been stand-alone, and devoid of any internal structure.

Providing the users had a reasonable memory capacity, a small inventory of phonetic sequences with agreed interactional purposes could take them a long way, and could provide as solid a basis for the long-term stability of a social group as the noise and gesture systems used by primates. And although there would be no grammar to these utterances—the speakers having, as yet, no potential to create or interpret one—once that potential *did* exist, modern human language could have developed fast and effortlessly, by a process of post-hoc rationalisation, based on the segmentation of the arbitrary phonetic strings into component parts. This is what we explore next.

4. The appearance of grammar

It makes sense to associate, in some way, the advent of full human language with the migration of the African community which, apparently descended from a *mitochondrial Eve* of around 200,000 years BP, seems to have spawned all modern humans (Stringer and McKie, 1994, p. 114). Whether, however, language was a mighty weapon that enabled them to wipe out all those in their path, or an attractive attribute that made them welcome interbreeders, has proved difficult to ascertain. We should also not rule out the possibility that they did not bring full human language with them, only the potential for it, or even that the aboriginals they encountered already had proto- or even full human language, or were spurred into developing it by the new survival pressures the encounter introduced. Whilst monogenesis seems most plausible for full human language, polygenesis is not impossible, and is perhaps even more probable for 'the earlier protolanguage, which could have developed naturally in various hominid types, with a success that depended on their mental capacity to manipulate its expressive potential and their ability to service it with a large enough phonetic inventory and memory.

However the transition came about, and whether it happened only once or many times, one important question looms. By what process did full human language emerge? Bickerton (1990, forthcoming) describes a simple biological change to a mechanism that 'was there all the time but was not being used for language' (Bickerton, forthcoming). He suggests that there was, during the protolanguage period, 'an ensemble [of discrete areas of the brain, that] could be regarded collectively as a preadaptation for syntax' but that 'syntax could not function until all the areas were linked into a single circuit' (forthcoming). It is this linking that he envisages as the transition point from protolanguage to full human language.³ One of the 'discrete areas' is 'thematic analysis', by which an individual can assess and keep track of the relationships between different members of the group. This, Bickerton believes, 'must have been selected for long before the hominid-pongid split' (forthcoming) and would entail the conceptualisation of actor, recipient, etc. A second area, which Bickerton believes thematic analysis became linked with, 'represent[ed] the phonetic shapes of words' (ibid), and was itself linked to 'the areas involved in conceptual structure' (ibid). This implies that a crucial feature of the flip-over into full human language was an expectation, for the first time, of having discrete phonetic units to express theta roles; and this is as good a place as any to begin a segmentation process (see below) if the protolanguage being thus treated is holistic. Thus, even though Bickerton himself does not believe protolanguage to have consisted of complete, holistic utterances, his account is one of several possible scenarios for the transition from protolanguage to full human language, that are compatible with it having been so.

³ It is, however, not clear how this process in itself would lead to language that was shaped by the principles of Universal Grammar.

On the other hand, scenarios that envisage a gradual reorganisation of a simpler grammatical system, under pressure from an overloaded memory (e.g. Ellis, 1997, p. 46; Locke, forthcoming) are less accommodating of protolanguage having consisted of functionally complex, holistic utterances. Even so, overload of this sort could certainly have been a catalyst for the transition to full human language, as could increasing demands on the phonologically usable phonetic inventory (Locke, forthcoming).

It is clear from the discussion so far that there are several current hypotheses regarding what pre-existing linguistic material this new grammar had to work upon. I have already expressed some doubt that protolanguage would have been at all stable or useful as a communication system if it had been equipped with words, waiting for a grammar to combine them. The maximum communicational continuity would have been achieved by taking protolanguage utterances of the kind described above and breaking them down.

Turning now to our best way of modelling the transition, there is a choice regarding one fundamental assumption. Did full human language appear *because* man developed a brain that had the same basic organisation and facilities as our own, or was there a multi-stage bootstrapping process? This is in some ways a re-run of the whole gradual versus one-stage evolution debate, just with the epithet 'protolanguage' shifted back a bit. However, it is important to address it here, because it makes a difference to the extent to which we can relate the transition from protolanguage to full human language to aspects of how we handle language today. I think that Occam's Razor gives us a good reason for working on the basis that the first analysers used a brain that was fundamentally set up in the same way as ours today (particularly as this does not necessarily entail that the entire transition was achieved in one generation, for reasons that will be outlined below). If this assumption is right, then we can look at the process of first language acquisition for clues as to how the first modern brains created system out of protolanguage.

We have only to look at the process that children go through in first language acquisition to see how streams of sound assigned meaning by context and pragmatics can be transformed into the makings of a lexicon and grammar. The parallel with first language acquisition has been noted by others (e.g. Bickerton, (1996), forthcoming; Locke, forthcoming; Studdert-Kennedy, forthcoming) but their focus has been on the primitive grammar that appears to underlie the one and two-word utterance stage of L1 acquisition. This, I believe, is too late in the process, because it is what children do once they have words and (some sort of) grammar. The child's simple grammar is a red herring in the quest for the nature of protolanguage because it is the *result* of the first analyses, rather than the *input* to them. If we want to find in child language clues to language evolution, we need to be looking at the raw material that children use when developing their grammar, and, crucially, how they perceive and use it. Although the modern child's input is rule-determined (or at least potentially so—see later), the child does not begin by treating it as such (Locke, forthcoming). Rather, it takes complete utterances as representations of complete meanings (e.g. Guillaume, 1927/1973). Peters (1983) has demonstrated how a child

may deal *first* in holistic chunks, understood and often articulated, and only *then* begin to develop a grammar, by segmenting these known, complete utterances.⁴

5. The process of segmentation

The one difference between children acquiring language today and the first ever modern humans developing theirs, is that children today have an already segmented language to segment, whereas the input for the first modern humans would have had no internal structure. Peters (1983) depicts segmentation as occurring when the child notices the points at which otherwise identical utterances tolerate paradigmatic variation, and inserts morpheme boundaries. Using context and pragmatics, the child can isolate meanings for these units, leaving the rest of the utterance to carry the remainder of the message without, at that stage, any further segmentation having been achieved. Thus a child might determine that there are morpheme boundaries before and after *teddy* in *shall we take teddy to the shops?* on the basis that yesterday it heard *shall we take dolly to the shops?*⁵ The hypothesis would be reinforced by subsequent utterances like *yes, that's teddy*, and *we're going to the shops*. While the child is becoming more sure of where *teddy* starts and ends and what it refers to, it may not yet know how *shall we take _to the shops?* is internally organised to carry the remainder of the entire meaning that it associates with the utterance.

The first human analyser(s) would have had a more difficult job. Paradigmatic variation in the phonetics would be unprincipled. Phonetic similarity in two utterances that also had some aspect of meaning in common would be entirely a matter of chance, not a pre-existing system. Nevertheless, chance would provide some starting points, and, as the account below will suggest, that may be sufficient.

To illustrate how segmentation might have first occurred⁶, let us take the two imaginary utterances suggested earlier, /mɛbita/ and /ikatubɛ/ for *give her the food* and *give me the food* respectively, and add to them a third, /kameti/ meaning *give her the stone*. These phonetic sequences should be seen as arbitrary, with the coincidence of syllables having no significance to its users, though it is the pivot upon which the segmentation can now operate. By chance, then /mɛbita/ and /kameti/ share the syllable /mɛ/ and also share, in their meaning, a singular female recipient. Adopting the interpretation which Peters (1983) does with children in 1LA, we can surmise that the analyser, perhaps specifically primed to look for a phonetic representation

⁴ Similar processes have been identified for naturalistic L2 acquisition (e.g. Wong Fillmore, 1976; Hakuta, 1976; Peters, 1983; Nattinger and DeCarrico, 1992) but these are not directly relevant to our discussion here, nor, as I have argued elsewhere (Wray, 1997; in preparation) perhaps more than coincidentally and superficially similar to the L1 acquisition process.

⁵ Note that this makes it important that the child receives input with some continuity of structure more tightly determined than simple grammaticality can offer. Preferred ways of saying things, and, here, particularly, the use of frames with spaces for open class items, are a characteristic of adult native speaker language (Pawley and Syder, 1983)—see later discussion.

⁶ Studdert-Kennedy (forthcoming) also proposes a form of segmentation, but it is motivated by syntactic patterns rather than, as here, phonological and semantic ones.

of the theta role as Bickerton (forthcoming) has suggested, creates a morpheme boundary around /mɛ/, giving it the meaning of *her*⁷, with the remainder of the utterance continuing to be associated with the remainder of the meaning with no further segmentation. In a second round of segmentation let us imagine that the coincidence of /ka/ has been noticed in /kameti/ and /ikatube/. What these two utterances share in meaning is the idea represented in English by the word *give*, and we can imagine, therefore, that /ka/ could be separated out by morpheme boundaries and attributed this meaning.

This leads to a problem which was inevitable from the start. If the phonetic sequences are arbitrary, any hypotheses formed will be undermined by counter-examples. Here, /mɛbita/ also contains the meaning of *give*, but has no /ka/. At this stage, then, one of several things might happen. Firstly, the hypothesis that /ka/ means *give* might be abandoned—this is something which children do if a segmentation turns out to be unreliable, as their errors (e.g. ‘Take that hat on off’, Crystal, 1997, p. 234) indicate. Secondly, a hypercorrection might take place, providing /ka/ where it ‘should’ be, perhaps by altering an existing, unattributed syllable. In other words, /mɛbita/ might be changed to /mɛbika/. This means there are now *three* examples of /ka/ meaning *give*, strengthening the case for the validity of this segmentation. Hypercorrection (overgeneralisation) is also common in children as they attempt to identify patterns (Bates et al., 1988, p. 33). Thirdly, hypercorrection in the other direction might occur. If the string is /mɛbita/ and *give* is represented by /ka/, then /mɛbita/ cannot mean *give her the food*, though it clearly must mean something close enough that it occurred in similar communicational situations. /mɛbita/ might be attributed the meaning *take her the food* or *present her with the food*, creating a nuance of meaning because the language seems to be furnishing it (c.f. the *Principle of Contrast* as discussed by Carstairs-McCarthy, forthcoming). Thus, in the spirit of Whorf, language would be leading thought, as well as thought

⁷ Utterances translatable using pronouns rather than personal names seem highly plausible. One of the problems with a holistic system would be the number of discrete utterances required, if the meaning was too specific. It is clearly advantageous to be able to use the same utterance, translatable as *give her the food*, for all female recipients (indeed there is no reason to assume *him* and *her* rather than *that one*). Such a protolanguage would be by nature highly context, and possibly gesture, dependent. For a community operating in the here and now, using utterances to affect the behaviour of others, this is perfectly appropriate and workable. As general categorisation seems a necessity, one is left wondering whether personal names would have even existed. If it could ever be proved that they did, I think one would have to concede that grammar existed too. Certainly, the account presented here could not easily accommodate personal names. To have any use in a language made up of holistic utterances, the name would need to be appended to them, to specify, for example, which female was to get the food (*give her the food Sharon*). This is setting up semantic (even if not syntactic, where there is no internal structure to the main utterance) co-reference, and if there were two nameable participants, an order would have to be specified. I am inclined to move in the other direction, and contemplate there being no specific reference at all, so there were *only* pronouns. In this case, there would be no utterances for *give her the meat* and *give her the stone*, only one for *give her that* and others for *give her this*, *give her these*, etc. This possibility depends upon being prepared to attribute to protolanguage users the cognitive tools for categorising the world in a way (not necessarily our way) that carved a path between the wastefulness of too many classes, each with its own complete set of utterances, and the incomprehensibility that could so easily result from too few classes.

presenting the fundamental baseline for what was expressed and how it was interpreted. Historical linguistics shows that we will manipulate meaning to accommodate a form: where absolute synonyms might otherwise appear, an alternative solution to discarding one of them is to split the semantic space, either dividing the reference itself (e.g. *smell/odour/perfume/stench*) or the register/usage (e.g. *man/fellow/bloke*; *salt/sodium chloride*) (Crystal, 1995, p. 164). Where a pronoun was involved, this hypercorrection of meaning might lead to the differentiation of cases and/or participant roles. If, for example, there was no /mɛ/ in the sequence meaning *carry her*, then it might be concluded that /mɛ/ meant *her (recipient)* but not *her (object)*. As for the impact that a single segmented item might have on the larger process, Tomasello's (1992) observations of first language acquisition indicate that the identification of one item in, say, the verb category does not necessarily immediately lead to a recognition of that category.

The stages described so far are the easy ones. There is a world of difference between picking out the odd word, and forcing an entire inventory of arbitrary phonetic sequences representing utterances through a complete and successful analysis. However, we can continue to draw on the observations of modern L1 acquisition to gain insight into the question what happened next? Children are not noticeably debilitated by their failure to have, as yet, completed their analysis of the language, because they continue to use all the pragmatic and contextual clues available to them to understand complete utterances well beyond their analytical comprehension. Furthermore, they carry on employing holistic utterances in their own production. Indeed, this is something which they never stop doing, for such utterances are a well-documented feature of adult native speaker language (e.g. Pawley and Syder, 1983; Sinclair, 1991). We can hypothesise, then, that although full human language was developing out of the older protolanguage system, it operated *alongside* it, not instead of it. Importantly, if the communicative system continued to operate holistically anyway, segmentation would not have to be completed in one generation. This removes the problem inherent in trying to imagine how communication could be successful during the period, however long or short, in which analytic language was emerging; there need have been no *disadvantage* in having the capacity to segment, for one would operate for the most part as an ordinary member of the community, communicating holistically. All the same, the *advantage* of being able to perform the 'magic' of creating constituent meaning could have given those individuals the selectional edge without separating them socially. Each generation could chip away at the analysis, leaving some of the hard bits for later and hypercorrecting others, altering the order of identified morphemes, beginning to create novel utterances analytically (as young children do) and thereby both extending the creative powers of what they had and setting up a need for more of the building blocks. The results of their analysis would be available to the next generation, who would acquire the two systems in parallel (as children do today—see later). There may be a critical mass point at which sufficient words and basic grammatical functions were observable in the analytic language of the adults for the new generation to make a final leap, transforming the 'pidgin' into a fully-operational language (Bickerton, 1988).

If segmentation happened bit by bit, what would happen to any phonetic units that did not get assigned a meaning? They might simply become omitted. They might attach themselves to other units as an at first unprincipled, but perhaps subsequently justified, phonological variation on an established form. They might forge links across one morpheme to another, creating 'separable' roots that accepted an infix.

6. The problem with analysis

The story might end there. Man develops the ability to segment language. Words are extracted, grammatical relations sought and 'found', the holistic utterances crumble, hypercorrected to accommodate the grammar, and from then on man constructs his sentences by rule. This is the potential of the system we possess, and this is the scenario that modern syntactic theory has presented for the 'ideal speaker-listener' (Chomsky, 1965, p. 3). However, that is not actually how we deal with our communication. Although we have the ability to operate only by rule, producing grammatical sentences that are novel and, if desired, communicatively useless, we do not actually seem to do this most of the time (Chafe, 1968; Coulmas, 1979; Pawley and Syder, 1983; Sinclair, 1991).

6.1 Formulaic language today

Since the 1970s there has been a small but persistent voice supporting the view that a significant proportion of our day to day utterances are not generated by rule but retrieved whole from store, even though they are, in many cases, entirely regular to the rule system (e.g. Becker, 1975; Bolinger, 1976; Pawley and Syder, 1983). In the 1990s, direct evidence from corpus studies led Sinclair (1991) to the same conclusion: 'A language user has available to him or her a large number of semi-preconstructed phrases that constitute single choices, even though they might appear to be analyzable into sections' (p. 110).

Belief in holistic processing in fact substantially predates this. Saussure (1916/1966) described the process of 'synthesizing the elements of [a] syntagm into a new unit ...[such that] when a compound concept is expressed by a succession of very common significant units, the mind gives up analysis—it takes a short cut—and applies the concept to the whole cluster of signs, which then becomes a simple unit' (p. 177). Sapir (1921) spoke of 'sequences [of words] that have shrunk together and away from other sequences or isolated elements in the flow of speech... Speech is thus constantly tightening and loosening its sequences' (p. 111f). Bloomfield (1933) observed that 'many forms lie on the border-line between bound forms and words, or between words and phrases' (p. 181). Firth (1937/1964) proposed that 'when we speak...[we] use a whole sentence...the unit of actual speech is the holophrase' (p. 83), and he placed a primacy on the identification and listing of 'usual collocations', which he saw as characteristic of communication within a speech community (Firth, 1952-1959/1968, p. 180ff). Hymes (1968) noted that 'a vast portion of verbal beha-

vior ... consists of recurrent patterns, of linguistic routines...[including] the full range of utterances that acquire conventional significance for an individual, group or whole culture' (p. 126–127).

Quite why modern human language should process some sequences of words holistically has been something of a puzzle for anyone who believes that we are well-furnished with a powerful and creative generative system. Pinker (1994) effectively denies the existence of holistic language, saying of 'word-chain devices' (which are 'bunch[es] of lists of words (or prefabricated phrases) and a set of directions for going from list to list') that they are 'not just a bit suspicious; they are deeply, fundamentally, the wrong way to think about how human language works' (p. 91–93). Most others, however, recognise that there must be some mutually beneficial interaction between rule-generated language and prefabricated language. Wong Fillmore (1976) comments that 'if a speaker could communicate only by applying grammatical rules, he would no doubt be a man of far fewer words' (p. 297), and Becker (1975) sees the two processing strategies as in balance, though with the upper hand to the holistic (p. 32f).

Holistic sequences, albeit superficially disguised by a range of nomenclatures,⁸ and henceforth called 'formulae' here, have been associated with processes in first language acquisition (e.g. Peters, 1983; Hickey, 1993), second language acquisition (e.g. Wong Fillmore, 1976; Hakuta, 1976; Vihman, 1982; Bygate, 1988; Cowie, 1988; Nattinger and DeCarrico, 1992; Weinert, 1995; Ellis, 1996), adult native language (Pawley and Syder, 1983; Sinclair, 1991; Cowie, 1994a,b; Butler, forthcoming) and aphasia (e.g. Benton and Joynt, 1960; Van Lancker, 1987; Code, 1987; Wray, 1992). Although the units have a considerable amount in common, they are not identical across these different manifestations (see Wray, in preparation), something which supports an explanation of their existence and usefulness that extends beyond language *form* into communicational *function*. Some formulae are non-canonical, that is, could not be produced by the regular rules of the grammar, but others are entirely regular; this means that they *could* be generated by rule, but appear not to be, at least not all of the time (Nattinger and DeCarrico, 1992; Tuggy, 1997). While non-canonical formulae must, presumably, have been learned whole, the canonical ones may have been constructed by the user on a previous occasion and stored for quick retrieval, in a process which Peters (1983) calls *fusion*.

⁸ Terms include *chunks* (Miller, 1956), *sentence builders* (Becker, 1975), *formulaic speech* (Wong Fillmore, 1976), *lexicalised sentence stems* (Pawley and Syder, 1983), *semi-preconstructed phrases that constitute single choices* (Sinclair, 1991), *lexical phrases* (Nattinger and DeCarrico, 1992) and *routine formulae* (Cowie, 1994a,b). Nattinger and DeCarrico (1992, p. 29, note 5) add the following to this list: '*idioms* (Fraser, 1970); *holophrases* (Corder, 1973); *praxons* (Bateson, 1975); *preassembled speech* (Bolinger, 1975); *gambits* (Keller, 1979); *conventionalized forms* (Yorio, 1980); ... and *composites* (Cowie, 1988). Ellis (1997, p. 48) offers the following additions: '*holophrases* (Corder, 1973), *prefabricated routines and patterns* (Hakuta, 1974)', and Van Lancker's (1987, p. 102) list includes: '*ready-made expressions* (Lyons, 1968), *schemata* (Tyler, 1978), *stable and familiar expressions with specialized subsenses*, *frozen metaphors* (Pickens and Pollio, 1979; Lakoff and Johnson, 1980)... *collocations* (Mitchell, 1971; Bolinger, 1961, 1976) and *co-ordinate constructions* (Malkiel, 1959; Cooper and Ross, 1975)'.

Several writers, including Becker (1975), Pawley and Syder (1983) and Nattinger and DeCarrico (1992) have produced taxonomies of the various types of formulae. Some salient distinctions are:

- idioms (e.g. *how do you do*; *that's the way the cookie crumbles*);
- adjuncts, preambles etc. (e.g. *what in the world ...*; *and another thing...*; *by and large*);
- collocations (e.g. *sheer/pure coincidence* but not **great/*true coincidence*; Becker, 1975; Bolinger, 1976)
- sentence frames and builders (e.g. *Could you pass the _?*; *NP be-TENSE sorry to keep—TENSE you waiting*; Pawley and Syder, 1983);
- standard situational utterances (e.g. *Can I help you?* *Was there anything else?* *Can I take a message?* *Don't you dare!*).

6.2 Functions of formulae

More significant than form, however, is the *function* associated with formulae. The formula *Can I help you?* means more than *Am I able to be of assistance to you?* It is a signal that one is the next in the queue, and it can be used in that sense by even the most unhelpful of shop staff without irony. Nattinger and DeCarrico (1992) have pointed out that 'lexical phrases' (as distinct from 'collocations') characteristically carry meaning that is functionally independent of (even if derivable from) the one explicit in their internal structure (p. 36). *Once upon a time*, for example, marks the start of a child's story, and *And another thing* is a turn-holder in conversation. Closer scrutiny indicates that the ways that formulae are used in our language today fall easily into three basic socio-functional categories (Wray, in preparation):

- the successful manipulation of others;
- group membership and identity;
- fluency and holding the turn.

6.2.1 Manipulation

As mentioned above, Nattinger and DeCarrico (1992) make a link between what they term *lexical phrases* and discourse function. They propose that once a sequence becomes formulaic, it can become easily detached from the meaning afforded it by its constituent parts. The often non-literal meaning that lexical phrases adopt is, they claim, mostly associated with the achievement of functional interaction: requests, commands, censures, etc. (p. 36f). In other words, they appear to be employed as a way of getting things done and of expressing and re-negotiating relationships. There are very tight controls within the social group on how these things are achieved linguistically, determined by the existing relative status of the interlocutors. We react very strongly to inappropriate levels of politeness or other register features, acknowledging that a proportion of the message is contained in the implications of that choice. Thus, we know that the way to get something done is to ask in the appropriate way (see also Section 6.2.2), using a complex set of pragma-

tically determined interactional strategies that include, in English, indirectness, the use of modals, tone of voice and posture. These we learn by imitation and this is one of the aspects of language that parents do actually teach their children (e.g. *Don't forget to say 'Thank you for having me'; You have to say 'Please may I leave the table'*).

Formulae are used manipulatively in first and second language and in aphasia, as well as in normal adult language. In the earliest stages of child language (Peters, 1983; Hickey, 1993), formulae latch directly onto the previous communicational strategies employed by the child, such as gesture, eye movement, smiling, and intoned noise, all of which are also holistic in nature. They enable effective communication well before there is grammar, something crucial to the child's need to manipulate others for its survival. Halliday (1975) identifies Nigel's earliest expression types as the *instrumental*, *regulatory*, *interactional* and *personal* (p. 18ff). The first two are clearly manipulative (*I want* and *do that*), the third and fourth are expressions of personal and group identity. These utterances are phonetic sequences such as /nã/ for 'give me that' and Halliday sees them as lacking the syntax element of the three-level structure of adult language, having a simple content-expression (and thus holistic) form (Halliday, 1975, p. 12). In the forum of L2, a learner who lacks knowledge of the grammar will use a phrasebook's entire sentences to produce standard requests, questions and transactions, i.e. those interactions that require a specific practical outcome from another person. Another situation in which grammar is not available but manipulative communication is necessary is some forms of aphasia, where the mechanisms for the expression of novel utterances have been destroyed or cut off. Where 'automatic speech' remains—platitudes, exclamations and a range of memorised lists, rhymes, etc. (Benton and Joynt, 1960; Code, 1987; Wray, 1992)—these can be used to considerable communicative effect independent of their literal content (Van Lancker, 1987, pp. 81–82).

6.2.2 Group membership

Formulae form a subset of the grammatical ways of expressing an idea, constituting what native speakers tend to actually say. Pawley and Syder (1983) observe that insufficient knowledge about which expressions are idiomatic is one of the ways in which even highly proficient non-native speakers can mark themselves out as non-native. Compare, for example, (1), spoken by a Dutch air stewardess, with (2) a more likely native version in the same circumstances.

1. *The Captain has just illuminated the seat belt sign, as an indication that landing is imminent.*
2. *The Captain's put on the seatbelt sign, which means we're about to land.*

The point is that (1) is entirely grammatical, and could easily be spoken by a native. Yet it would tend not to be (Pawley and Syder, 1983).

The group division is not just a native/non-native one, however. Sociolinguistics has clearly demonstrated how other group identities are expressed by using the 'right' words or phrases, as well as the 'right' accent, intonation, and so on. Becker (1975) highlights the wider interactional demands that language addresses, noting

that 'a high proportion of utterances are produced in stereotyped social situations, where the phatic and ritualistic functions of language demand not novelty, but rather an appropriate combination of formulas, clichés, allusions, slogans, and so forth' (p. 1). The drive to belong, in the sense of creating more or less distance between one's own external identity and that of the people one likes and dislikes, is very strong, and failure to create social alliances has the potential to threaten the mental and physical health, even the survival, of an individual.

A second aspect of group identity comes from our use of the social platitudes that keep our relationships oiled. If you see someone you know in the street and do not say *hallo, how are you?* it is not your failure to enquire after their health that will upset them but your apparent refusal to acknowledge them as a member of your 'group'. Similarly, saying *happy birthday* to someone is not significant in its ability to make their birthday any happier, but because it labels them as a member of the group to whom you feel it appropriate to give good wishes. This sort of ritualistic behaviour lends itself to ritualistic forms of expression.

The group also has an internal structure and hierarchy that can be expressed using holistically managed language. An individual may be honoured by having features of his/her own idiolect raised in status and adopted by others. Furthermore, the very words spoken by that person may be remembered and quoted, as a signal of his/her authority. This ranges from *what my father always said was...* right through to the Gettysburg address or *I have a dream today*. The flip side, within academic discourse at least, is unattributed quotation—that is, plagiarism—which carries great stigma and heavy penalties, because of the honour that is due to those whose utterances are remembered, stored and reproduced whole by others.

6.2.3 *Fluency and holding the turn*

'When a snappy, emphatic response is called for, we average speakers do not have time to compose a devastating epigram. Therefore we memorize a long list of wise-cracks, putdowns, refusals, taunts, etc., so that we will always be ready to say something in case we have to assert ourselves before we have a chance to think' (Becker, 1975, p. 22). Becker's observation highlights the fact that successful interaction is often at odds with the production of novel utterances. At a more general level, formulae can provide a bed upon which the central novel proposition lies, so that any lengthy utterance is likely to contain many prefabricated frames and adjuncts. One of the purposes of fluency is that it is a way of holding the turn, and thus keeping the focus of attention on yourself and your ideas. Where fluency breaks down, therefore, alternative ways of retaining the turn become useful. Just as fluency itself is achieved in part with prefabricated phrases (Nattinger and DeCarrico, 1992, p. 32), so we stall and play for time by using holistically stored and retrieved fill-in phrases such as *Well, the thing is*, *What I wanted to say was*, *Yes but*, *But hang on*, etc. Bygate (1988) describes a similar strategy in L2 learners engaged in oral tasks, though in this case, lacking a suitable repertoire of such adjuncts, they tend to repeat fragments of their own, or their interlocutor's, previous utterances.

There is also evidence that fluency within a single turn or turn exchange may be perceived as more important than propositional continuity. Todman et al.

(e.g. 1994a,b) found that speech-disabled users of their computer-enhanced conversation system (based on the quick retrieval of pre-stored utterances) preferred, when they had no suitable response, to keep the conversation going with a filler and/or to instigate a topic shift, rather than stop to generate a more accurate response letter by letter. Transcripts of conversations produced using this system (e.g. Grant, 1995) suggest that the user will even compromise on truth and/or grammatical accuracy (relative to the form of the previous utterance) in order to take their turn and sustain fluency. This is reminiscent of Tannen's (1984) observations that the drive for rapport and fluency in conversation can lead to irrelevance (p. 95) and confirmatory repetition of what another speaker has said, even when it is known to be incorrect (p. 76).

6.3 *The role of formulae*

The above sections demonstrate that formulaic language today plays a variety of roles that pivot on social interaction. But why should we need them, now that we have a grammar-based analytic system? One answer is proposed time and again (e.g. Bolinger, 1976; Wong Fillmore, 1976; Coulmas, 1979; Sinclair, 1991; Wray, 1992), namely: 'so that we do not have to go through the labour of generating an utterance all the way out from 'S' every time we want to say something' (Becker, 1975, p. 17). It seems that holistic language may be picking up the shortfall between what we want to say and what we have the processing power to compute from scratch, by removing the burden of the everyday, pragmatically determined and communicationally predictable, leaving the way clear for the more demanding analytic system to achieve the goals that only it can (Wray, 1992). We appear to rely on holistic processing in the course of normal interaction, not because to use the analytic system is impossible, but because it is an expensive strategy.

7. *The relationship between analytic and holistic processing today*

In the final part of this paper, therefore, I propose an explanation for the continued use of holistic language today. This relates to limitations in the processing space made available by our short term memory (Nattinger and DeCarrico, 1992, p. 31f). If one of the greatest advantages of the advent of analytic language was that it relieved pressure on memory created by the inventory of protolanguage utterances (see earlier), it would be ironic that it should be memory limitations that also curb the power of analytic language. The structural organisation that syntax provides is clearly of advantage in allowing us to pack several thoughts into the same sentence (Lieberman, 1991, p. 82; Wray, 1992, ch.1), but there are notable problems with the way that the packing is done. One of the classic illustrations of this is centre-embedding. Syntactic theory is obliged, in admitting the embedding of one clause into another, to permit it *ad infinitum*. Left-or right-embedding creates no problem as in (3) and (4).

- (3) *The murderer was sentenced to life by the judge who owned the car that was commandeered by the policeman that the criminal hit.*
- (4) *The criminal hit the policeman who commandeered the car that was owned by the judge who sentenced the murderer to life.*

However, centre-embedding, as in (5) creates a sentence that is predicted to be grammatical but which is unprocessable:

- (5) **The judge the car the policeman the criminal hit commandeered belonged to sentenced the murderer to life.*

I suggest that at the point when the analytic system first became available to humans, it was not, as might be supposed from reading much of the literature on this subject, the rightful consummation of a union between brain and voice, but rather the introduction into a stable if limited communication system, of a powerful mechanism for which there was insufficient backup. One might liken it to giving a sports car to a three-year-old child; the potential of the machine would be far greater than its possessor has the capacity to tap. The effect of overload on the analytic system, particularly in compromising other important analytic tasks such as the evaluation of propositions, has been explored in some depth by Wray (1992).

The solution to the problem of having too little on-line processing capacity to easily handle analytic language at all times, was to fall back on the older, reliable holistic system for precisely those aspects of communication which it was best at: interactional functions. Holistic processing became the preferred strategy for coping with a range of different problems that could arise in the course of interacting through the medium of language: where the social aspects of the interaction were more important, or where it was necessary to retain fluency whilst constructing a complex utterance, formulaic language was, as it still is, drawn upon to meet the communicational shortfall (Wray, 1997; in preparation).

The above account does not, of itself, engage in any kind of challenge to the *content* of syntactic theory. What is proposed is that syntactic theory is focused entirely on only one of two systems that we customarily use. To study the underlying capabilities of the 'ideal speaker-listener' (Chomsky, 1965, p. 3) is more than to discount 'such ... irrelevant conditions as memory limitations, distractions, shifts of attention and interest, and errors' (*ibid*). Returning to the image of a sports car given to a child, it is the difference between studying the potential capabilities of the car (a perfectly legitimate occupation), and studying how its three-year old owner actually gets around, with or without it (a different occupation, focused on the real world rather than an ideal one). The competence–performance distinction, in other words, may entail a much greater depth of contrast—right to the very basics of where and how a string of words originates—than has customarily been claimed for it.

Our modern human language should not, perhaps then, be seen as the pure analytic machine that Chomsky would have us believe, but rather as an uneasy compromise between a rule-based and a holistic system. Without the rule-based system, language would be limited in repertoire, clichéd, and, whilst suitable for certain types of interaction, lacking imagination and novelty. In contrast, with *only*

a rule-based system, language would sound pedantic, unidiomatic and pedestrian. It would require full access to all of the language faculties at all times, and there would be no 'short cuts'. It would be a much more accurate reflection of what Chomsky terms *competence*, but *not* a reflection of *communicative competence* (Campbell and Wales, 1970; Hymes, 1972). The two systems together ensure that we are able to express (and understand) whatever we want, however mundane, poetic or unexpected. Additionally, they achieve the bonus of sustaining multiple levels of linguistic expression of our social identity, thus preserving an invaluable feature of the socio-interactional system of our primate ancestors.

Acknowledgements

This paper is based on presentations made at the Annual Conference of the University of Wales Vocabulary Acquisition Research Group in Trefeca, 1–3 July 1997 and the 5th International Cognitive Linguistics Conference in Amsterdam, 14–19 July 1997. I am grateful to Chris Butler, Malcolm Edwards, Nick Ellis, Paul Meara, James Steele, David Willis, Jane Willis and members of the University of Wales Vocabulary Acquisition Research Network for comments on earlier versions.

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