

**GRAMMAR**

**And**

*Language*

**A study of the ways in which grammar creates and is created by  
language**

# **Grammar and Language**

**A study of the ways in which grammar  
creates and is created by language**

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**Dedication:**

**For Philip, who made this possible;  
and Peter, who made it certain.**

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# 1. Introduction – What this paper is about

The history of Linguistics is divided into time periods by dominant discourses, and each period had a convention about the proper area of study for Linguists. In the earliest days of European scholarship (the Greeks) language was considered either a gift of the gods (Plato) or a product of the Group Soul from which we all came (Aristotle). The emphasis of study seemed to be on language as a phenomenon and not on the mechanisms of language. However, the Greeks and Romans did study the nature of words, and gave us the broad lexical categories (noun, verb, adjective, etc) that are still used today.

After the darkness of the 5th to 10th centuries the study of language was one of the slowest of the sciences to regain its status. For centuries language just happened and was not considered a phenomenon for study. Like so much at the time the foundation of knowledge was belief and not scholarship, and the almost-mystical way that language appeared in the minds of children looked to be more the area of religion than science. In the 15<sup>th</sup> Century Stephen Scrope and Anthony Woodville thought of humans as pre-formed beings, and they saw learning (and language) as an activation of internal knowledge best achieved by serenity and the exercise of reason.<sup>1</sup>

This changed with the Enlightenment, and in the 18th century a whole series of new directions were taken in language study. Some people, like Swift, sought to stabilise their language and minimise change. A part of this stabilisation was the establishment of a standard lexis and spelling - something that Caxton had complained about over 200 years before, when he described the misunderstanding that eyren, a dialect word for eggs, had caused<sup>2</sup>. But the main impetus of 18<sup>th</sup> century standardisation was directed at establishing a definitive scientific grammar even at the expense of the language itself. As Swift wrote:

I am of the opinion, it is better that a language should not be wholly perfect, than it should be perpetually changing.<sup>3</sup>

A prescriptive approach to grammar became the main theme of language study until the 20th century, so much so that the dictionarists (like Dr Johnson and Noah Webster) were considered mere word collectors. Meanwhile the grammarians became so influential that the study of language actually became known as Grammar.

At the beginning of the 19th century another prescriptive movement began in the English-speaking world, to amend spelling to match the then-accepted standard pronunciation. Webster had some success in America, possibly because he concentrated mainly on word endings, possibly because America had many people for whom English was a second language, possibly because America was attempting to distance itself culturally from Britain. But the British efforts (George Bernard-Shaw's alphabet and Nue Spelling

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<sup>1</sup> Jonathan Hughes, *History Today*, Feb 1999, p33.

<sup>2</sup> William Caxton, Preface to *Eneydos*, 1490, from *Cambridge Encyclopedia of Language*, p5.

<sup>3</sup> Jonathan Swift, *Proposal for Correcting, Improving and Ascertaining the English Tongue*, 1712, from *Cambridge Encyclopedia of Language*, p4.

among others) were failures. The only institutionally supported implementation was Isaac Pitman's Initial Teaching Alphabet in the 1960s. It was a signal failure, and has acted as a blight on many people's lives:

Y cannt iy b a loyer  
 Iy rote a good leter  
 To the solisiters, it waz  
 In mi best riting.  
 Ow well iy did tri mi best  
 Dident iy.  
 Cud it b the wey iy waz  
 Tawt to rite wen  
 Iy waz yung.<sup>4</sup>

However, these phonetically **prescriptive** approaches to language were overshadowed by the work of Saussure. He placed emphasis back on the structure of language, but not on the prescriptive grammars of the 19th century. He forcefully distanced himself from these by rejecting even the word grammar:

It offers no scientific or objective approach to a language as such. Grammar aims solely at providing rules which distinguish between correct and incorrect forms. It is a prescriptive discipline, far removed from any concern with impartial observation, and its outlook is inevitably a narrow one.<sup>5</sup>

But this left Saussure with the problem of naming the structural rules he found operating in real language use, and it became an issue he never fully resolved. However, his work on *langage*, *langue* and *parole* (the faculty of language, language rules and language in use) set the study of linguistics onto a new, and much more scientific path.

In the twentieth century the study of language has moved out of its traditional areas into social studies, psychology, anthropology, even biology. The ubiquity of language has now been recognised, and people are asking how far it is a defining feature of humanity (Pinker, 1994; Dunbar, 1996; Deacon, 1997; Lieberman, 1998). The number of notable linguists has increased significantly, all of them offering new insights into the nature and use of language. However, one linguist has dominated Linguistics for the past forty years and has contributed in a major way to the base and direction of the science. That person is Noam Chomsky.

Chomsky's contributions to linguistics include theories on the Language Acquisition Device (a mental mechanism for acquiring language), Universal Grammar (an engine present in all humans which dictates the way language works, and which therefore dictates a universal similarity between human languages), the dual structure of Deep and Surface grammar, and the concept of language as a series of nested functions rather than a serial phenomenon. The contributions of Chomsky cannot be overstated.

In the 1990s, however, some new ideas began to take hold, and three events set linguistics onto a new

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<sup>4</sup> 'Class of 66', Steve, Brighton, The Big Issue, 2<sup>nd</sup> week of February 1998.

<sup>5</sup> Ferdinand de Saussure, *Course in General Linguistics*, Trans. Roy Harris, p13

path. The first was a series of studies of language in animals, especially in primates. These actually began back in the seventies with the Yerkes project, but the significance of the discoveries has only recently begun to be reassessed. The second event was a new interest in language by anthropologists: their interests in the physical and mental sources of language have added an extra dimension to linguistics. And the third event was the discovery of ways of mapping brain activity in action. PET and MRI scans show that the areas of the brain used in language production and comprehension differ notably between individuals: no physical Universal Grammar module has been found.

The trouble with this theory [*that the human mind is composed of modules*] is that the human mind doesn't seem to work in this way. There is little evidence that the higher level cognitive skills on Cosmides and Tooby's list - such as friendship and tool use - exist as modules in the mind. Further, the modern mind is characterised not so much by its modularity - a capacity to respond to many tasks in a fast but rigid fashion - but by its flexibility, an ability to think laterally, and to use analogy and metaphor.<sup>6</sup>

Supported by anthropological and psychological theories like Mithen's Cognitive Fluidity<sup>7</sup>, some Linguists are beginning to question whether Chomsky's theories provide a sufficiently complete picture of the phenomenon of language.

It is at this point that this study will begin, by attempting to establish a definition of grammar which is component-based, rather than the effect-based definitions currently used. Hopefully this will establish that analysis of components leads us down a different but parallel path to the conventional definitions. The differences between language and other forms of communication will also be reviewed, and evidence will be introduced from various animal studies as to the nature of communication without language. The attempts to introduce linguistic concepts to nonhumans will also be considered to try to establish in which ways these efforts were successful and unsuccessful.

The study will next look at words as units of meaning, and as instruments of and creators of analogy. It will attempt to analyse the way we extract meaning and understanding from words, and explore why meaning, understanding and words are three different things.

Having established the bases for the component grammar model the model itself will then be formulated and evaluated. The vectors and the divisions within the model will be analysed, and the uses and functions of the model will be discussed. There will also be some consideration of component grammar as a text analysis tool.

Finally, the arguments made in the paper will be reviewed. Any outstanding issues which are likely to cause problems with the component grammar model will be listed, and the limits of the model will be established along with areas where it would be inappropriate to apply it. Hopefully by the end of this paper the component grammar model will have been initiated as a tool for further investigation, a visual

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<sup>6</sup> Kenan Malik, Prospect, December 1998, p25

<sup>7</sup> Steven Mithen, The Prehistory of the Mind, ch10

representation of a useful linguistic reality.

Throughout this paper English will be used as the language of study, except where explicitly stated. It is not the intention to provide a universal explanation and structure of language; instead it is intended to provide a model which can be applied to English, and which may prove useful in the analysis of other languages.

Certain terms will be used idiosyncratically in this paper. As the concern is communication there will be a need to separately identify certain features in that communication. Existing words will be used where possible, but the definitions will be more specific than usual. Some of the most important terms are given below.

- Communication:** The process of passing a *message* between a *sender* and a *receiver* by the use of a *signal*. Both sender and receiver are integral to this definition.
- Code:** The rules by which *meaning* is coded into a *message*.
- Language:** The specific messaging code used by humans. It includes the rules whereby *meaning* is coded into or interpreted from the *communication*.
- Meaning:** The reason for the *communication*. The intention of the *sender* and the interpretation of the *receiver* are both forms of meaning, although in a successful communication they are the same. Intention and interpretation need not be cognitively inspired, they can be genetically or hormonally inspired.
- Message:** The structure containing both the *intended meaning* generated by the *sender* and the *interpreted meaning* received by the *receiver*. Both sender and receiver are integral to this definition.
- Receiver:** Any human or nonhuman who interprets a *message* from a *signal*.
- Sender:** The generator of a *signal* intended as a *communication* (i.e. containing a *message*). Also called the signaller.
- Signal:** A set of sounds or actions or scents or other indicators that are generated by a *sender* to encode a *meaning* into a *message*. The sender is integral to this definition, but not a receiver.

The relationship between the terms listed above is somewhat like the diagram below:

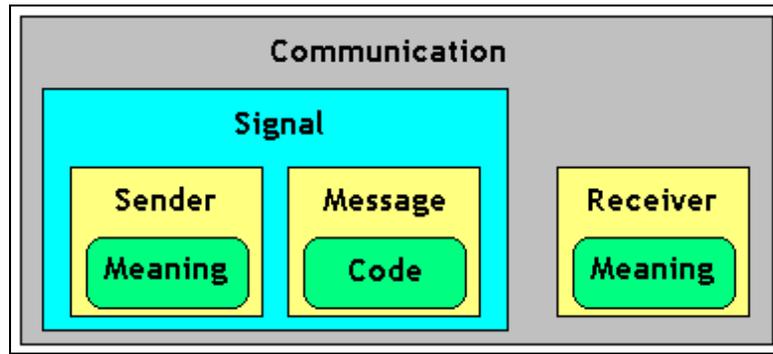


Diagram 1 - The Relationship between the Terms Used

Meaning is a function of Sender and Receiver; Code is a function of the Message; the Sender and the Message are functions of the Signal; and the Signal and the Receiver are functions of Communication. This set of nested relationships and the definitions they espouse are of the essence of this paper.

## 2. What is Grammar?

### 2.1. Other People's Definitions

Grammar is a wide-ranging concept and has been used for a whole series of specific descriptions. Even a basic definition of grammar has to cover a lot of ground. The Collins Concise English Dictionary (1982) describes it as:

1. The branch of linguistics that deals with syntax and morphology, sometimes also phonology and semantics.
2. The abstract system of rules in terms of which a person's mastery of his native language can be explained.
3. The systematic description of the grammatical facts of a language.

This definition identifies three uses of the word in different contexts. The first describes the function of grammar in the discipline of linguistics, defining it as a set of tools for analysing certain identified structures within the discipline. The second is also a linguistics definition, describing grammar as a structure itself, capable of being analysed by other tools. The third definition is the everyday description that most people would recognise: grammar describes language and is integral to it. But these descriptions do contain a degree of circularity, in that they describe grammar in terms of itself; and they by no means exhaust the possible definitions of grammar.

Everyone knows what grammar is; or, at least, everyone knows grammar when they see it. But a full definition of the nature of grammar seems to be quite elusive. We have already seen how the Father of modern linguistics, Saussure, dismissed grammar. However, his views were very much of their time: Saussure was fighting against the prescriptive grammars of the 18th and 19th centuries, which tried to express grammar as an idealised form of language. For Saussure, language happened in speech and writing, and grammar had no existence outside of language. He was intent on putting grammar in its place as the servant and not the master of language.

The redefinition of the word Grammar as a description of language was addressed by Chomsky. He saw grammar as a structure intrinsic in language and working intimately with lexis, rather than an imposition of structure upon lexis. He developed the idea of the Language Acquisition Device as a mechanism to explain the way young children acquired language:

The language faculty has an initial state, genetically determined; in the normal course of development it passes through a series of states in early childhood, reaching a relatively stable steady state that undergoes little subsequent change, apart from the lexicon. To a good first approximation, the initial state appears to be uniform for the species. Adapting traditional terms to a special usage, we call the theory of the state attained its *grammar* and the theory of the initial state *Universal Grammar* (UG).<sup>8</sup>

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<sup>8</sup> Noam Chomsky, *The Minimalist Program*, p14.

From this we can see Chomsky's view that some of what we call grammar is arbitrary, but it is built upon a fixed and definable base. However, he does not define the content of that base.

Another view of grammar is given by Palmer. He says:

It [Grammar] describes what people do when they speak their language; it is not something that has to be found in books, written down or learnt by heart.<sup>9</sup>

This is descriptive of where we find grammar, but tells us little of the function of it. To be fair to Palmer this is a quote from a book dedicated to the subject, and there are many other references to nature and use. But the whole thrust is towards grammar as an expression of language, rather than as a general expression of messaging.

Crystal<sup>10</sup> identifies six different types of grammar: *Prescriptive* grammar, a set of rules to be aspired to; *Pedagogical* grammar, a book of prescriptive grammar rules; *Traditional* grammar, the attitudes and methods that produce prescriptive grammar; *Descriptive* grammar, an analysis of how language actually works; *Reference* grammar, a book describing descriptive grammar; and *Theoretical* grammar, a study of the structures behind descriptive grammar. Essentially there is a binary division into prescriptive and descriptive approaches, but once again the definitions are somewhat circular: grammar is the rules, perceived or predetermined, by which grammar is defined.

Pinker splits grammar into Generative, Mental and Stylistic grammars. His definition runs as follows:

A generative grammar is a set of rules that determines the form and meaning of words and sentences in a particular language as it is spoken in some community. A mental grammar is the hypothetical generative grammar stored unconsciously in a person's brain. Neither should be confused with a prescriptive or stylistic grammar taught in school...<sup>11</sup>

But once again grammar is defined by exophoric reference to a set of rules without looking at the building blocks from which the rules are generated. The usefulness of Pinker's approach is that he can differentiate between two levels of Chomsky's Universal Grammar: the engine that produces the rules and the rules produced. But the emphasis is still on innate grammar without defining what is likely to be innate or learned.

Halliday took a different view of grammar to that of Chomsky. Where Chomsky excluded meaning from the study of grammar, Halliday insisted that it is central. He developed a structure that he called Functional Grammar to formalise meaning into the structure of language. A definition of Functional Grammar is:

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<sup>9</sup> Frank Palmer, *Grammar*, p14.

<sup>10</sup> David Crystal, *The Cambridge Encyclopedia of Language*, p89.

<sup>11</sup> Steven Pinker, *The Language Instinct*, p476.

'How we can say things' is a very simplistic description of what the language covers, but it does indicate the role of the grammar in offering conventionally accepted wordings to express meanings. A more formal way of putting this is to describe grammar as the set of linguistic resources available to us for making meanings.<sup>12</sup>

Functional Grammar attempts to define a structure for language which explains the way it works in terms of the function it has - to convey meaning; without meaning language becomes an intentionless process of sonic interference.

## 2.2. The Components of Grammar

From the descriptions above it seems clear that grammar is an expression of structure within language; it defines the building blocks of language (mainly words) and their functionality; it exists in the relationships between words as well as in the words themselves; and it functions both as an expression of meaning and as a governed response to intended meaning. Somehow, it appears to function at many different levels, and yet the structure at all those levels is similar. What are the constituents that allow this to happen?

At base there is only one purpose for grammar, and that is to accurately convey messages. The needs of the message impose the structure on language that we call (or that has an independent existence as) grammar:

...the fact remains that an ordered relationship between the actor, the action and the recipient forms a basic deep structure that seems to be universal.<sup>13</sup>

It would seem sensible to use these definitions (Actor or Instigator, Action and Recipient) as an initial definition of the constituents of grammar. But what do these terms define?

Let us start with the Action: every message contains a reference to an action performed, due to be performed or defined as performable. This is obvious in language constructs like *I went home* or the ant trail between nest and food, but is less apparent in such things as the non-committal response grunt of a human watching television. However, in this case the action of creating a message (the grunt) becomes the action of the message: it is a simple acknowledgement. A negative counts as a performance: *I didn't go home* is still an action, in that it is a choice to do something other than going home. Also, the action can be stated directly, or implied by context or convention. When a person says *OK* they may be agreeing, acquiescing, equivocating or concluding a previous topic to introduce a new one. An action can also be a process, as in *I'm on my way home*; a state, as in *I'm at home*; an event, as in *I arrived home*; or a

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<sup>12</sup> Geoff Thompson, *Introducing Functional Grammar*, p36.

<sup>13</sup> Robin Dunbar, *Approaches to the Evolution of Language*, p100.

decision, as in *I'm going to go home*. Halliday<sup>14</sup> describes twelve experiential divisions of the English verb process: existing, having attribute, having identity, symbolizing, saying, thinking, feeling, seeing, behaving, doing, creating and happening.

If there is an action then there is always an Instigator of the action. Bickerton<sup>15</sup> expresses this as the agent-plus-action structure, and he points out that this nonhuman mechanism cannot be directly equated with language structures, in which agent and action are usually separated. But he also recognises that the agent is more readily identified than the action in such structures. The agent or Instigator can be the message creator, the message recipient or some other party, which correspond to the first, second and third persons in traditional grammar. In language the use of pronouns allows us to cross-reference the Instigator with a previously defined person or thing. But the Instigator can also be implied, as in *Must try harder*: nothing is directly indicated as needing to try harder, but we know that something or someone must be the Instigator in the statement. *It's raining* is another case of an implied Instigator: even though *it* is explicitly expressed, the nature of *it* is not explicit. In this case the thing causing the rain is existent but not significant in the message. Even where there is no identified Instigator the action still requires one: there can be no Action without an Instigator. Finally, the Instigator of the message (the Sender) is not the same as the Instigator in the message; the first is always the speaker or writer, the second is whatever is indicated by the action as causative.

The Recipient of the action, like the Instigator, can be first, second or third person; it can be cross-referenced and it can be implied. In addition, the Recipient can also be identified as the Instigator, a form we call reflexive. Sometimes this has to be directly stated, but in some cases the action is so intimate that reflexion is culturally the norm. So we would say *John injured himself* because injury can be caused to self or other; but in *John sat himself down*, *himself* is redundant - the action of sitting is assumed to be reflexive unless otherwise stated. In French, however, sitting is explicitly reflexive, indicating that there is no universal language rule here.

Instigator, Action and Recipient are sufficient to build a simple grammar, but they do not express the full range of messages issued either by humans or nonhumans. A major factor in messaging is the inclusion of specification or deixis: space is a major part of every animal's life. We move around in space, we are blocked by it, we value different parts of it in different ways:

Primates have many skills of spatial perception in their locomotion, their foraging and, in some cases, their tracking and capturing of prey. Indeed, the "where" system of direct spatial perception involving creative, dynamic anticipations seems to be widespread in the animal kingdom.<sup>16</sup>

It is unremarkable that such a basic survival ability should be a factor in messaging.

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<sup>14</sup> Michael Halliday, *An Introduction to Functional Grammar*, p108.

<sup>15</sup> Derek Bickerton, *Language and Species*, pp97-98.

However, deixis takes three forms, only one of which is spatial. The other two (contextual and temporal) would appear to be something different, until we look at the way they work in the human mind. Contextual deixis is the differentiation of objects not by direct pointing but by identification of salient features. So *that book* is spatially identified, but *the blue book* is contextually identified. However, what about *the lefthand book*? This would appear to be spatial deixis, but the situation in which it applies is contextual: if the book is moved, or if other books are placed next to it, it may no longer be *lefthand*. However, *that book* is always *that book* - or is it? Take the following exchange:

Give me that book.  
 What, this book?  
 Yes.

This is classic deixis: the identification of object by proximity to the speaker. Close objects are classified by *this*, further objects by *that*; and, in some dialects of English, far objects are indicated by *yon*. So the book that is closer to the second speaker than the first is referred to as *that book* by the first speaker and *this book* by the second: “thisness” or “thatness” isn’t part of the object. Compared to this, the blueness of the blue book is positively inherent. Simply, the human mind seems to mix the differentiations of context and space, and their deixis is interchangeable.

So is temporal deixis something different? To qualify as different it would have to show some special mechanism not present in other deixis, and there is nothing immediately evident. Indeed, when we look at the way we deal with time we see that we use metaphors from spatial (and occasionally contextual) deixis to express ourselves: *He arrived ahead of time* or *Time is moving on* or *It's been a long time*. The metaphor of time as space is used in many languages, including Maori (*muru* = *afterwards* or *the rear*). Lakoff and Johnson<sup>17</sup> state that the way events occur in time determines how they are interpreted onto the model of the Universe in the mind. They identify two ways in which time is spatially mapped: as a static line the Actor moves along, and as a moving tableau passing before the Actor. However, there is one aspect of temporal deixis that gives a reason to identify it as different to other deixis: as far as we can tell, only humans are able to express themselves temporally - it may be that we are the only creatures who have a need to do so.

One final aspect of grammar is the subject of connectivity. This occurs in several ways: the simple repetitive calls of African banded mongooses act to stabilise the call within the community, and identify the signal with its message<sup>18</sup>; there seems to be no limit to the connective iterations in this sort of messaging. But connectivity can also be used to create complex messages by reusing and reintegrating message elements into longer messages. This may be the case in whale calls<sup>19</sup> but, apart from this (and a few other possible but poorly-understood examples), no evidence exists of signal complexity except in human language. Language has the ability to embed structures within other structures to create messages

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<sup>16</sup> Tomasello and Call, *Primate Cognition*, p53.

<sup>17</sup> Lakoff and Johnson, *Metaphors We Live By*, pp7-9, 16, 22-24.

<sup>18</sup> Marguerite Smits van Oyen, *Banded Together*, BBC Wildlife, March 1998, pp64-70

much more complex than any detectable in nonhuman nature. For instance *The man that John saw going to the cinema was just a friend of a friend*: this sentence contains levels of embedding that are not easy to unravel. However, we do know that the human mind does not allow infinite connection, and finds difficulty understanding messages where more than three levels are involved.

Connectivity is a very important part of language, but somewhat ignored by many grammar studies. The implications are complex and it is unlikely that this paper will have room to explore them fully. However, Connectivity will not be ignored in this paper.

### 2.3. A New Definition of Grammar

From the above a component definition of grammar can be composed as follows:

Grammar is the relationship in a message between the Action, the Instigator of the action and the Recipient of the action, allowing for expression of temporal deixis, other deixis, and limited connectivity.

This definition covers the traditional grammar requirements of subject, verb, object, tense and case. Hopefully this definition will provide a sufficiently wide base upon which to build the thesis of this paper.

It is important to note the difference between the first three components (Action, Instigator and Recipient) and the last three (Temporal and Other deixis, and Connectivity). The first three components are more “real” than the last three: Instigator and Recipient have actual identity and the Action is the defined relationship between them. Deixis and Connectivity, on the other hand, are ephemeral and contextual: Temporal Deixis can change from future to past even as the signal is generated; Spatial and Contextual Deixis are reliant upon the statuses of the Sender and Receiver, the Instigator and the Recipient, and the relationships between them; and Connectivity is usually an arbitrary relationship identified by the Signaller. This division between the “bricks” and “mortar” of communication is often identified in language as the division between content and function words<sup>20</sup>. However, the bricks and mortar metaphor tends to give an image of a static object being built out of other static objects, while the components of signalling fit together more like lumps of clay; and, like clay, they carry their mortar with them. Indeed, it can be argued that mutability of meaning and function is one of the defining characteristics of language.

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<sup>19</sup> Charles Seife, *New Scientist*, 27 February 1999, p24.

<sup>20</sup> Jean Aitchison, *Words in the Mind*, pp99-100.

### 3. The Nature of Communication

#### 3.1. Communication and Evolution

At base our language is just an agreed code for private mental processes expressed in various grunts, calls and gestures. How did this collection of sounds and movements (the signal) become coded into language? How does the intention of the sender become understood by the receiver?

The process of transferring meaning between Sender and Receiver is communication, and it is endemic throughout nature. However, one specific form of communication, language, is limited to humans. So how did language arise? In Darwinian terms, for language to survive as a trait it must function to make our species more fit for survival:

Whatever the cause may be of each slight difference in the offspring from their parents – and a cause for each must exist – it is the steady accumulation, through natural selection, of such differences, when beneficial to the individual, that gives rise to all the more important modifications of structure, by which the innumerable beings on the face of this earth are enabled to struggle with each other, and the best adapted to survive.<sup>21</sup>

Even if we adopt Blackmore's approach, that memes have become more dominant than genes in human development, there has to be an inherent fitness to language:

The human language faculty primarily provided a selective advantage to memes, not genes. The memes then changed the environment in which the genes were selected, and so forced them to build better and better meme-spreading apparatus. In other words, the function of language is to spread memes.<sup>22</sup>

What are the factors that give language an advantage over other forms of communication? Are there any special requirements in certain forms of communication which mean that language is a prerequisite? The purpose of all communication is to transfer a message from a Sender to a Receiver so that the message received is the same as the message sent. To do this a common signalling process must be used. The signal is not the message – a signal requires only a sender and not a receiver – but signals include the medium by which the signal is generated, and also contain the intention of the signaller.

The above seems to have implied a level of intention in a signal, but that intention does not have to be conscious. In fact most signalling in nature is genetically inspired and automatically produced. The signal is often a single sound or action which contains an entire message, but the fact that there is only one sign in the communication does not mean that the contained message does not have "room" to refer to Instigator, Action, Recipient and Deixis. Convention is a powerful device for establishing common meaning, and genes are a powerful device for establishing convention:

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<sup>21</sup> Charles Darwin, *On The Origin of Species*, p170.

<sup>22</sup> Susan Blackmore, *The Meme Machine*, p99.

The gene pool will become an *evolutionarily stable set* of genes, defined as a gene pool that cannot be invaded by any new gene. Most new genes that arise, either by mutation or reassortment or immigration, are quickly penalized by natural selection: the evolutionarily stable set is restored.<sup>23</sup>

The more conventional the signal the less complex it has to be. Humans will agree code-words to express particularly important facts in stressful situations: Army parade-ground instructions, bidding signals in an auction, the children's code-word to opt out of a game are all examples of this. Also commands like *stop!*, statements like *yes* and *no*, and polite forms like *thanks* and *hello* function as elliptical references to large events.

Animal signals are no different: most are produced in stressful situations, and non-complex conventional signals are vital for receiver understanding. This, in turn implies that the signal should be distinct (easily identifiable) and short (quickly identifiable). These two factors limit the range of usable signals available to the animal, even if the abilities to produce and recognise signals are quite sophisticated:

The costs of encoding and decoding increase with the number of alternatives each party has to consider. Large codes take more sensory and brain tissue, and large numbers of alternative signals make difficult the optimal allocation of signals that will minimize propagation distortion, energy costs, and predator risks.<sup>24</sup>

Of course, with other animals we are faced with the problem of how we can understand the meaning within the signal: what we see is a sound or action event instigated by one individual, followed by an action event by another individual. If we see the same sequence repeated then we can say that the events appear to be causally related. If we see the sequence repeated by different individuals then we can assume that the relationship of events is not just causal but conventional, too. But what is the meaning within the signal? It is likely that we will never know what intention is in the mind of a signaller, if any; signals do not need individual intention to carry meaning, the meaning can be generated by genetic or programmed imperatives (instinctive or conditioned). But at least the meaning in the message understood by the receiver can be interpreted by the action taken. In this way we can build up a lexicon of screech events and their results, a process that has been successfully carried out by Cheney and Seyfarth for vervet monkeys<sup>25</sup>.

But are the components of grammar, identified in 2.3, identifiable in nonhuman signals? Let us take a couple of examples, starting with the warning chitter of the grey squirrel. Many urban dwellers have encountered this: they are walking through the park and spot a squirrel. As they approach, it suddenly dashes up a tree and is gone. But, just occasionally, the squirrel stops when it is out of reach and chitters at the approaching human. It is not fully clear what the action is in the message: it could be a warning not to come closer, a call informing you that the squirrel is now unassailable, a distractor to draw your

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<sup>23</sup> Richard Dawkins, *The Selfish Gene*, p86.

<sup>24</sup> Jack Bradbury & Sandra Vehrencamp, *Principles of Animal Communication*, p495.

<sup>25</sup> Richard Byrne, *The Thinking Ape*, pp205-209.

attention from what the squirrel had been doing, or probably a combination of these. But the Instigator (the squirrel) and Recipient (you) are clear in the message. This could be seen as reading more into the signal than really exists, but we have to accept that there was a purpose to the chitter, that it was generated by the squirrel and directed at the intruder, and it was intended to produce a change of behaviour in the intruder.

Our second example is from the ant, a eusocial creature that communicates mainly through scent. In the species *formica rufa* a forager leaves the nest and follows a zigzag path until she encounters some food. If this food is small enough to be carried by the forager she picks it up and returns by a straight line to the nest. If, however, the food is too large for the ant she will take a sample and lay a scent trail back to the nest. By a barely-understood method the forager gives cues to other workers about the source of the food (the method includes regurgitation feeding and antenna contact), and these workers then leave the nest, follow the trail and pick up the food. The workers will reinforce the trail on the way back if they have not exhausted the supply.<sup>26</sup>

The algorithm followed by the ants is simple, but it involves two messaging processes: the trail and the activation to collect. Ignoring the problems of activation, does the trail contain components of grammar? Obviously it contains Deixis and a simple Action form, possibly even an order form. But does it identify Instigator and Recipient? It would seem that the reinforcement of the trail by successive ants identifies all future users of the trail as Instigators, and the Recipient is the food. It is notable that the message remains relevant only as long as the food lasts. A simple, instinctive mechanism ensures that the message begins fading as soon as the relevance is lost.

Is this far-fetched, an attempt to impose an inappropriate model on these events? Do ants really have grammar? An interesting question, but not the one this paper has set out to answer. The question asked is: does a message produce a reaction in a third party to an object unrelated to the signaller? If it does then the elements of Instigator, Action and Recipient are detectable in the message; in the case of the ant, the Recipient (the food) is detectable to the message receivers only through the message. The intention was to discover whether the elements of grammar could be detected in the messages of animals, and it seems that they can be. If the components of grammar are present in pre-conscious nonhuman communication then it is reasonable to assume that their presence in language is a function of the pre-language state, and not dependent upon language. However, a caveat must be issued here; the grammatical components identified are not words or even semantic elements:

...signals don't evolve because they "mean" something; they evolve because they work. Again, the unwitting feedback between sender and receiver works to create signals that are informative without any conscious intent for them to be so.<sup>27</sup>

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<sup>26</sup> K Dumpert, *The Social Biology of Ants*, P58.

<sup>27</sup> Stephen Budiansky, *If a Lion Could Talk*, p137.

### 3.2. Metamessaging - the unintended messages within signals

Signalling is not a low-cost, risk-free enterprise. It involves expenditure of energy and can alert predators to the presence of the signaller. There has to be a good reason for the costs of the signal to be paid, and that is the value of the message contained in the signal. If the value of the signal to the signaller is less than the costs then the signal will not be made. This is elementary Darwinian accounting.

It can be assumed that every signal has an intended message, and whether that message is coded genetically or cognitively is not relevant here. A signal without an intended message is just a waste of energy, and so counter-productive that it would have been strongly selected against in the process of evolution. However, the intention of the sender does not need to be recognisable in the detail of the signal for the receiver to recognise the gist of the message.

Take the case of the saddleback bird in New Zealand<sup>28</sup>. This bird has a distinct and personal territorial call, which has to be noticeably different to all other saddleback calls in the area. The birds recognise each other by their calls, so if all your neighbours are in their expected place and reply to your call then the status quo holds. If one of the neighbours fails to call and a new call is heard then there is the possibility of gaining territory at the expense of the new claimant. If an extra new call is heard then there is an interloper and he will have to be driven away or territories redefined.

To repel interlopers the saddleback uses a different type of call. This is a standard call which has to be recognisable by all other saddlebacks, so has no distinguishing features. Where the message in the territory call relies on a signature (the Instigator in the message is the signaller, it is an "I am here" signal), the message in the warning signal relies on the receiver understanding his transgression clearly.

What the saddlebacks show is that "I am here" messages do not need to have a shared signal. Their utterance is sufficient for the message to be received. But if the signal can vary while the message remains the same, it introduces the question of what extra information is contained in the variation. Obviously there could be information about size of bird and therefore strength, there could be messages for prospective mates about the bird and its territory; and there will be unintended messages, such as informing predators about the location of the signaller. In fact these additional messages can be found in every signal. In this paper they will be referred to as metamessages, but in linguistics they have been called inferences, implicatures, and connotations.

When a warning of attack is issued the main message would appear to be directed at the possible prey. But there is a metamessage to the predator that it has been seen. In a sexual display an animal usually demonstrates an index of general fitness (large tail, strong song, agility, food finding, etc). But this index signal contains the metamessage of fitness as a mate:

In some species [of bird] whose males take no part in parenting, males spend a great deal of effort for many hours a day, many days in a row, on courtship dances. The females visit the dancing arenas, called *leks*, where they watch the performances and choose fathers for their offspring; very few of the dancers are chosen.<sup>29</sup>

Metamessaging is almost unavoidable in any signal, but in language it takes an unusual twist. If Alf comes to me and tells me that Beth is a liar and not a nice person, I receive a whole series of metamessages which Alf cannot avoid giving: Alf wishes an alliance with me; Alf does not like Beth; Alf is possibly planning a move against Beth or expecting a move by Beth. If Beth then approaches me and tells me not to trust Alf I receive more metamessages: Beth reciprocates Alf's dislike; Beth wishes an alliance with me also, so I may be a key figure in this dispute; something is definitely going to happen between Alf and Beth, possibly soon.

These metamessages make language a conduit of truth regardless of the message given. I still do not know if either Alf or Beth are liars, but it seems likely they both are - which is predicted by the Machiavellian behaviour model:

The crucial issue here is probably the fact that readings of superficial behaviour leave you open to both misinterpretation and deception. Actions are one step removed from intentions, and thus introduce one more point at which errors of transmission and errors of interpretation can occur (thereby making Machiavellian behaviour possible).<sup>30</sup>

The only way to suppress metamessages is silence, which can be truly dangerous in a communicative society. If I warn of a lion's presence when there is none then I have caused a small reduction in your feeding time and a large reduction in your trust. If I do not warn of a lion when there is one but merely make good my own escape, then your loss could be total. If it is not, then my loss of your trust is probably total. This fear of silence may help explain the "does he take sugar" approach that many mutes suffer. It is not a misassociation of speaking with hearing, but a feeling that the inability to speak excludes the person from the communicating community, both speaking and listening:

Few groups in history have suffered such sustained and uncomprehending cruelty as the so-called 'deaf and dumb'. In most civilizations they have been treated like animals, if not worse: their sensory disadvantage has not only deprived them of the natural experience of sound, but also shut them out from the human world of language.<sup>31</sup>

Any form of communication can be untruthful, but it will always contain metamessages - interestingly, the more truthful the message the fewer metamessages it contains. *Alf is a liar* tells me nothing about Alf, but a lot about the speaker's relationship to Alf. However, *I do not like Alf* contains the metamessages of the first message as direct messages, and there is very little additional metamessaging added. Of course *I*

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<sup>28</sup> David Attenborough, *The Life of Birds*, p178-179; and video episode 6.

<sup>29</sup> Amotz & Avishag Zahavi, *The Handicap Principle*, p34.

<sup>30</sup> Robin Dunbar, *Approaches to the Evolution of Language* (ed Hurford, Studdert-Kennedy, Knight), p102.

<sup>31</sup> Jonathan Rée, *I See a Voice*, p85.

*do not like Alf* could itself be a lie, but it would be either an inept lie (with no Machiavellian advantage) or an example of strategic subtlety - what I say gives me no advantage so it is free information for you. But free information usually has a hidden cost, in obligation if nothing else; and a lie creates an obligation without cost to the signaller. With free information it's best to believe the main message may be untruthful and look at the metamessages. This is illustrated in the human follow-up question: *I do not like Alf* seems to invite the question *why*, in an attempt to elicit the missing metamessages.

Since lies will always contain metamessages, they can be considered less dangerous than silence. The metamessages of a lie are unavoidably truthful while silence, in contrast, carries no message. Thus there is a pressure towards communication from the side of the listener - trust is built up by the exchange of messages regardless of the truthful content of the message. Indeed, the less truthful the message the more metamessages it contains. If I say *trees are green* I am telling you no more than you already know. If, however, I say *trees are red* I start a whole process in your mind to try to work out why I should use such an obvious lie. Grice<sup>32</sup> established some cooperative principles by which humans seem to assume meaning in an utterance, of which Sperber and Wilson<sup>33</sup> identified Relevance as the main maxim. Considering my statement about the trees to be relevant, you are able to use your experience and your knowledge of context to determine my reason for making the statement. You may well reply *only in autumn*, converting my inaccuracy into a specific accuracy. Or you may use metaphor to examine my terms, responding with the question *you think they are a communist plot?* Or you may just contradict my proffered knowledge with *no, they aren't*. In every case what has determined your response is the relevance of what I have said, but the relevance is not in the signal, it is in the receiver.

One of the metamessages of most messages is conditionality. A warning is a statement about an existing threat, but its effectiveness is in preventing an event from occurring. It is the conditionality of this event which gives the signal its force: only if the event is serious but avoidable is the signal worth making. In the case of territorial or other threats the signal acts in place of a violent confrontation. It contains metamessages about the proposed violent confrontation which can actually prevent the confrontation from happening. A male elephant seal's booming call is energy-intensive, but less so than the conflicts it prevents.

This leads to the question whether other animals ever indulge in simple statements about their environment, devoid of conditionality and metamessage. There would seem to be a poor cost-to-gain ratio in such behaviour: what is the point of a signal without a wish or warning attached? It represents a free transfer of data with no reciprocity, and therefore a net loss to the signaller. Metamessages would appear to be one way to bring this behaviour back into balance, by creating duties, debts and social acceptance in the receiver. A large part of human language communication involves statements rather than warnings and wishes, which tends to indicate that metamessaging is a major part of language.

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<sup>32</sup> HP Grice, *Studies in the Way of Words*, pp26-27.

<sup>33</sup> Dan Sperber & Deirdre Wilson, *Relevance – Communication & Cognition*.

### 3.3. Signals and Words

The identification of objects by class rather than by purpose needs words; and words would seem to be a function of language, and therefore unavailable to non-linguistic creatures. We can eat a nut but, as far as we can find out, a squirrel can only eat food that we would call a nut. In addition we can recognise a similarity between a hazelnut and a peanut, and a difference between those and an apple. A squirrel can recognise the similarity between two hazelnuts, but it is not in its survival interests to recognise the "nuttness" of two different types of nuts. Human children will happily eat blueberries and redcurrants - and belladonna berries. Squirrels do not have the class of "berry", so will leave the deadly nightshade alone.

The fact that other animals do not classify objects in the same way as humans does not mean they do not have idealised models in their heads. The things that make up "acorn" to a squirrel, though, are a closed set. The squirrel works at one remove from reality, its mental models are not real but they consist of specifics of reality which gives them a one-to-one correspondence between their models and reality. Also, the models are reactive in that they are triggered by the object rather than being proactively called to define the nature of "acorn". These models cannot be seen as analogies because they are not generated as partial referents using existing relationships, they stand alone and neither take their meaning from other models, nor give meaning to others.

But why would the squirrel want anything more complex than its simple cognitive structure? The further a correspondence is stretched from reality the less use it has in identifying that reality, and the less use it has in survival. But the more use it has in bringing new concepts or objects into the ambit of the mind of the being. This extra level introduces symbols, and is the level that language is based on. This does not mean that nonhumans do not use symbols:

The success of Sherman, Austin and Kanzi [two chimpanzees and a bonobo] at acquiring the ability to use symbolic reference in a limited fashion demonstrates that a modern human brain is not an essential precondition for symbolic communication. Chimpanzees who have learned a modicum of symbols in the laboratory have the benefit of dedicated researchers who can construct an elaborate training context. The first hominids to use symbolic communication were entirely on their own, with very little in the way of external supports.<sup>34</sup>

Peirce<sup>35</sup> noted this identification within signals of Icon (a direct representation of an identifiable single object), Index (a direct representation of an attribute which can be used to place an object in a class of objects) and Symbol (an indirect representation of a class of objects which can be used by analogy to represent the objects within the class, or even objects outside of the class). In language we find all three of

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<sup>34</sup> Terrence Deacon, *The Symbolic Species*, p401-402.

<sup>35</sup> Charles Sanders Peirce, *Selected Writings (Values in a Universe of Chance)*, p368.

these things: *this apple* identifies the apple as a single object, an Icon; *an apple* identifies the fruit as a member of the class apples, and therefore an Index; and the word *apple* itself is an indirect representation of the class of apples, and can be used metaphorically in ways that are unrelated to apples, as in *the apple of his eye*.

The nature of words is such that they are all capable of being used as symbols. Even proper names (icons) like Alf can be used symbolically, as in *the Alfs of this world*: this does not refer to people named Alf but people with similar attitudes to a specific person named Alf. Dennett<sup>36</sup> has identified this cognitive feature of language as a defining difference with other forms of communication. Deacon goes on to argue that the uniqueness of symbolisation is not just a feature of language but the factor that allowed language to develop in the first place.

With some notable exceptions, we have made very little progress in analysing the signals of other animals, although there has been extensive study of their communication techniques. Indeed, an inordinate effort appears to have been put into making other animals understand us. But where we have made some progress in understanding their signals we find that nonhumans give very little description of the nature of the referent in their signals. Bees can signal the direction, distance and abundance of a food source, but they cannot indicate any obstacles in the path or the action to be taken<sup>37</sup>; ants can leave trails showing the way to food, but they cannot indicate the type of food<sup>38</sup>; vervet monkeys have different calls for a threat from an eagle or from a big cat, but they do not differentiate between types of bird or cat. And, indeed, why would other animals need to name their referents? *Look out, lion* is no more or less use than *Look out, predator on ground* (although it says something about our relationship to language that the first is much shorter than the second). Similarly, it is a matter of supreme indifference whether the food found by an eciton ant is a dead rat or a dead buffalo, so long as it can be found subsequently by nestmates.

Does this mean that other animals have no concept of difference? Everything is just food, or danger, or pleasure? No, it doesn't. If anything, it means precisely the opposite: other animals may have a much greater understanding of differences than do humans. Indeed, it is possible that most have no concept of grouping (symbols), so they review every instance without preconception. This does not mean they also have no concept of similarity (indexes): recognising one blueberry as similar to another aids survival. But recognising berries as a class does not. Of course we cannot know for sure what is happening in the minds of nonhumans but, from what we know about animal behaviours, this is not an unreasonable conclusion.

The likelihood is that, if other animals hold abstract concepts at all, they hold sensory images rather than abstracted classes. Their idea of food would be more like the pictures in Macdonald's, with very strong smell and taste cues working in concert to specifically identify an item without resort to generalities. This

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<sup>36</sup> Daniel C Dennett, *Kinds of Minds*.

<sup>37</sup> James L Gould & Carol Grant Gould, *The Honey Bee*, p63-64.

<sup>38</sup> John H Sudd & Nigel Franks, *The Behavioural Ecology of Ants*, p111-116.

is acorn because it smells, tastes and looks "acorn". It would not be *an* acorn or *like* an acorn, which implies that some criteria of a general case are satisfied; it would *be* acorn, because *all* the criteria of the general case are satisfied. It is unlikely that an animal would display the apochryphal human folly of biting into a wax fruit.

So we can see that most animals demonstrate no detectable capabilities of symbolisation; and the few possible exceptions (cetaceans and primates) remain unproven. Symbols, which give the ability to deal with novel concepts as well as pre-existing structures, define the lexical basis of language. Animals can identify cases, and they can compare these to previously experienced or genetically identified cases, but they do not appear to be able to speculate in the same way as humans. However, even if some animals are shown to have similar mental apparatus for symbolic representation, it remains the case that they do not demonstrate this ability in their communication. As symbols are so intrinsic to language it is reasonable to say that nonhumans do not have a language ability similar to humans, and the fact that we can detect no natural language in even one other creature tends to indicate that it is a purely human phenomenon. It may be that all creatures have their own language, as Doctor Dolittle believed, but it seems unlikely.

In the cases where animals have been taught to communicate in human terms the results have been far from conclusive. While studies like the Yerkes project have proved that apes, dolphins and grey parrots are capable of using signed verbal representations, there has been little evidence of complex language use. The ability to represent concepts has not been proven, although one or two tantalising sign combinations may illustrate an ability to use metaphor<sup>39</sup>.

Indeed, the Gricean maxim of seeking relevance in utterance would seem to have caused more than one case of wishful translation. In the following Internet chat with Koko the gorilla, Dr Patterson translated Koko's Amislan-signed responses to the questions posed by members of the public:

HaloMyBaby:	I'll start taking questions from the audience now, our first question is:
	MInyKitty asks Koko are you going to have a baby in the future?
LiveKOKO:	Pink
DrPPatrsn:	We've had earlier discussion about colors today
LiveKOKO:	Listen, Koko loves eat
HaloMyBaby:	Me too!
DrPPatrsn:	What about a baby? She's thinking...
LiveKOKO:	Unattention
DrPPatrsn:	She covered her face with her hands....which means it's not happening, basically, or it hasn't happened yet.
LiveKOKO:	I don't see it.
HaloMyBaby:	That's sad!
DrPPatrsn:	In other words, she hasn't had one yet, and she doesn't see it happening. She needs several females and one male to have a family. In our setting it really isn't possible for her to have a baby. <sup>40</sup>

However, Patterson's translations of Koko's signs are not definitive, and different interpretations can be

<sup>39</sup> Jean, Aitchison, *The Articulate Mammal*, chapter 2.

<sup>40</sup> Site: <http://www.hubheaven.org/educate/chattran.html>

made. It is interesting to note that Koko's first two responses are unrelated to the subject, while the last two are elliptical. The translation of *I don't see it* as a temporal reference is particularly notable: an alternative is that Koko has identified the sign *baby* and has responded that the object is not in view. But there are further problems: in Amislan *I don't see it* can be glossed as a double sign (see-not), which can also mean *I don't understand*. Are Koko's signs forming the same coherent discourse in Koko's mind as in Patterson's mind?

There are some elements of language that humans deal with effortlessly, but which seem to be missing from nonhuman linguistic efforts. One of them is syntactic organisation: the apes in all the language-teaching experiments seldom achieved more than two word utterances, consisting of explicit combinations of Instigator/Action, Recipient/Action or Instigator/Recipient. This does not mean that the missing elements were not implied, but that they were seldom made explicit. Additionally the components tended to be used in any order, indicating that the idea of structure outside the symbols was missing. As Pinker says:

The chimp's abilities at anything one would want to call grammar were next to nil. Signs were not coordinated into the well-defined motion contours of ASL and were not inflected for aspect, agreement and so on...<sup>41</sup>

Another component that seems to be missing is temporality. There were no conversations recorded discussing past events, nor any indication of future intentions, except inasmuch as they represented expected fulfillment of current wants. Non-requesting statements were recorded, but they represented comment upon current situations rather than recall or speculation. While it is possible to deduce a symbolic mind behind some of the signing, there is no real evidence of symbols being used just because they can be. The best that can be said is that further evidence must be gathered.

One of the most telling pieces of evidence may be intergenerational language retention, but there is little evidence to support or refute this. Most of the apes in the first tranche of studies were artificially prevented from breeding or forming peer groups with other apes, in an attempt to make their language experience as "human" as possible. There is some evidence of limited intergenerational tutoring, (Washoe and Loulis, Matata and Kanzi) but this is as yet inconclusive.

Trying to imagine the mind of a creature without words is incredibly difficult for humans. Much of our mental processing happens in words - or in object concepts, which wordlessly tag items as entities for shorthand referencing. Incidentally, the evidence that object concepts are not themselves words is available in everyday speech: We all use portmanteau words like *doobry*, *thingy*, *whatsit*, to name objects that are perfectly clear in our mind but for which we cannot currently select the right word. Animals may well use these object concepts, too. But without a generalising lexicon they are incommunicable, and must remain in the mind of the originator.

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<sup>41</sup> Steven Pinker, *The Language Instinct*, p339.

Our ability to express our object concepts to each other is a function of lexis. Even when we cannot find the right word we replace with a general word, we do not cease speaking. This general word replacement is also one of the uses of pronouns: they act as speech markers for items previously defined (third person) or culturally defined (first and second person).

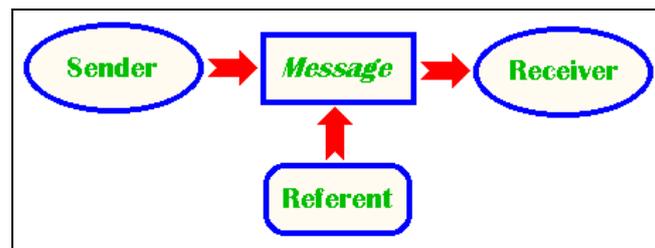
A lexicon thus acts as a bridge between the apprehension of symbols, which nonhumans may be able to do, and the communication of symbols, which appears to be a solely human trait.

### 3.4. Message Models and Semiotics

So far in this paper the signal has been identified as the engine of communication. The signal is a transmission from one individual to produce desired responses in other individuals; it does not require conscious investment by the signaller, or even a defined recipient. Its validity is judged solely by the question "does it work?" This structure is fine for evaluating most nonhuman communication, but it is deficient when applied to self-conscious individuals such as the higher primates. With self-consciousness a level of deliberation enters the signal process: truth is no longer self-defined within the signal and can be subverted. Self-interest subverts the genetic "selfishness" imperative<sup>42</sup>, and may be the primary meme in Blackmore's theory<sup>43</sup>.

The simple signal model is no longer sufficient to explain communication and has to be supplemented by the messaging function. Messages are conscious signals passed between two individuals: the effect produced upon the other individual is not pre-ordained and is subject to negotiation. Messages, therefore, carry within them a possibility of communication failure which is not present in simple signals. The study of messaging and its complications is known as Semiotics.

Semiotics is concerned with the relationship between the generator of the message (the **Sender** or **Signifier**) the **Receiver** of the message, the external reality the message refers to (the **Referent** or **Signified**), and the **Message** itself. These are the four objects in the basic semiotics model, and can be summarised in the diagram below:



<sup>42</sup> Richard Dawkins, *The Selfish Gene*, Chapter 12.

<sup>43</sup> Susan Blackmore, *The Meme Machine*, Chapter 9.

**The *Sender* generates the *Message*, which refers to the *Referent*.**  
**The *Receiver* receives the *Message*, and gains understanding of the *Referent* from it.**

Diagram 2 - The Basic Semiotics Message Model

Yaguello<sup>44</sup> points out the correspondence of the Sender, Receiver and Referent with the three grammatical persons: I, you and he/she/it. The message establishes the functional relationship between the three within its own context.

However, this model has several weaknesses when applied to language communication: the most serious is that messages do not occur as simple sender/receiver constructs, they form part of a two-way transaction in which the Receiver often participates in and moderates the message. To address this issue Jakobson<sup>45</sup> looked at the movement of information through the messaging process. He analysed the relationships between the objects in the model, and showed that each of the Objects has a relationship with the other Objects, giving six dual relationships:

- Sender and Message
- Sender and Receiver
- Sender and Referent
- Message and Receiver
- Message and Referent
- Receiver and Referent

Of these the Receiver/Referent relationship can be dismissed as trivial: the Receiver can only know the Referent through the message. Any knowledge the Receiver already has of the Referent is used to judge the message; that is, it becomes part of the message.

In addition to the five non-trivial dual relationships, each of the Objects has a relationship to itself. However, only one of these is of interest in Semiotics. The relationship of Sender to Sender and Receiver to Receiver are best left to the discipline of Psychology, and the relationship of Referent to itself is trivial; which leaves the relationship of the Message to itself. Adding this to the five dual relationships gives Jakobson's six functions, and they are usually expressed in the following way:

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<sup>44</sup> Marina Yaguello, *Language Through the Looking Glass*, p7.

<sup>45</sup> Roman Jakobson, *Language in Literature*, chapter 7.

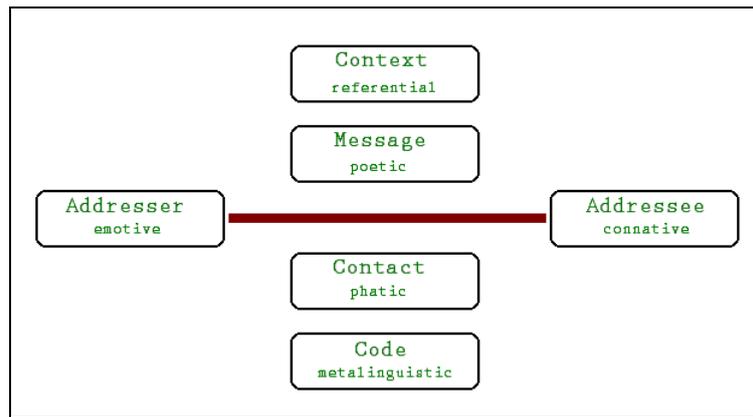


Diagram 3 - The Jakobson Function Model

### Sender and Message

This is the *Metalinguistic function*, the signs and symbols used by the Sender to convey the message. Usually there is mutual understanding of these signs and symbols between the Sender and Receiver, although knowledge acquisition by its nature implies a difference in understanding. A good example of metalinguistics would be the use of simple language to talk to children.

### Sender and Receiver

This is the *Phatic function*, the methods used by the Sender to engage the attention of the Receiver; it has nothing to do with the message itself. Greetings are a good example of the phatic function. Phatics were first identified by Bronislaw Malinowski, and Jakobson incorporated Malinowski's work into his more general model.

### Sender and Referent

This is the *Emotive function*, the attitudes the Sender adds to the message about the Referent. Adjectives are good examples of the emotive function. The Emotive function is always directed at the Referent: if emotions are directed at the Message then the Message becomes the Referent; If they are directed at the Receiver then either the Receiver becomes the Referent, or Phatic communication is taking place.

### Message and Receiver

This is the *Connative* or *Injunctive function*. It is the actual information the Receiver gains from the message, and it involves several levels of understanding:

- The *Denotation*: has the meaning intended by the Sender been received?
- The *Intentional Connotation*: have any subtexts intended by the Sender been received?
- The *Unintentional Connotation*: has the Receiver gained any meanings not intended by the Sender (Nuance)?

Examples of denotation and connotation occur in the territory call of the saddleback (see 2.2.2). The denotation is that the territory owner is still in place; the intentional connotation is that the status quo need not be challenged; and the unintentional connotation is to any predator who may be listening in. The nature of this function links it to the message/metamessage function.

### Message and Referent

This is the *Referential function*, and is basically the information contained in the message about the Referent. It is dictated by the information the Sender wishes to transmit to the Receiver (the denotation), and will always consist of a subset of the real or supposed attributes of the Referent. For instance, if I say *trees are green* I am not saying that *green* is the only important attribute they have, but I am saying that *green* is the only attribute the message is concerned with.

### Message and Message

This is the *Poetic* or *Aesthetic function*. It is the aspect of the message that has meaning only in relation to the message. This is perhaps the most difficult concept to grasp, because it steps on the toes of all the other functions. Word order is a good example of the Poetic function, but it is often deliberately used by the Sender as part of the Emotive function; different Phatic phrases used for the same purpose can have different Poetic content; Poetic methods always use Metalinguistic functions; and differentiating between the Poetic and Connative functions is not a simple matter. But, although it is hard to pin down, the Poetic function is real. Most humour is reliant upon it, and the subtleties that differentiate between good phrasing and great phrasing are poetic in nature.

One of the major innovations that language brought to communication is the use of symbols<sup>46</sup>. Language messages are essentially an exchange of socially conditioned symbols in a socially conditioned manner, but language can be the end as well as the means to that end, as is the case in constructs described by Austin<sup>47</sup> as Performatives. For instance, when I use the words *I will* in response to a request for me to do something, my statement is both a comment on a future event and a promise to perform that future event. By saying *I will* I have committed myself to perform the future act and, in the case of the marriage vows, created a duty to do so. In this case the message and the referent are coexistent.

However, performatives are not the only way that messages act as their own referents, as the following poem by Dorothy Parker illustrates:

Oh, life is a glorious cycle of song,  
A medley of extemporanea;  
And love is a thing that can never go wrong;  
And I am Marie of Romania.<sup>48</sup>

The untruth of the final line (which, incidentally, is only verifiable by exophoric reference) changes the whole poem from a positive statement to a negative one. This is achieved by simple logic: A and B true iff C, but not C so not A and not B. Whether we refer to this as rhetorical irony, Jakobson's poetic

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<sup>46</sup> Terrence Deacon, *The Symbolic Species*, p43.

<sup>47</sup> J L Austin, *How to Do Things With Words*.

function, Halliday's Logical metafunction, or a relationship between message and metamessage, the fact is that the message has become its own referent in terms of truthfulness. In fact the symbolic nature of language means that every message is its own referent, because symbols are analogies of reality, and analogies are self-referential.

Another approach to semiotics was used by Halliday<sup>49</sup>, when he looked at the linguistic information in the message itself to identify the nature of the information being transacted. He identified four metafunctions to the message:

- the Textual metafunction, which creates relevance between the message and the context;
- the Experiential metafunction, which establishes the message as a model of reality;
- the Interpersonal metafunction, which enacts the relationship between Sender and Receiver;
- and the Logical metafunction, which develops the structural interrelationships as expressed in the message.

The Logical metafunction is unlike the others in that it seems to exist beyond the message.

In addition to identifying the metafunctions, Halliday looked at the way that English clause structure maps onto them. In so doing he established a form of grammatical analysis that is functional in nature, rather than prescriptive (predictive but not necessarily related to real language use) or descriptive (related to real language use but not necessarily predictive of other forms). Functional grammar is intended to be both real and predictive, a task it achieves well, although most study has been in relation to English only.

So how does this fit with the component grammar model of Action, Instigator, Recipient, Deixis and Connectivity? From the discussion so far it would appear that this model exists not in the message but in the signal, it is an expression of identities in the signal by which the signal acquires significance. This expression underlies the linguistic expression in the message; but it is not reliant upon the structure of the message, its expressed structure is a deeper "shadow" of structures expressed in the message. So within the component grammar model we see a similar structure to that defined in the message models. In particular, the relationship between the component grammar model and Halliday's Experiential metafunction is striking.

However, a note of caution should be sounded here: the similarity of the models may not be because they are related but because they illustrate a general thought-model in humans. The structure of input / process / output / modifier is detectable in many human activities, as the following examples illustrate:

- A computer program:           Input data / Processing / Output data / Control parameters;
- A novel:                           Introduction / Exposition / Resolution / Genre;

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<sup>48</sup> Dorothy Parker, "Comment", from *The Best of Dorothy Parker*, p89.

<sup>49</sup> Michael Halliday, *An Introduction to Functional Grammar*, chapter 1.

- Building a house: Foundation / Building structure / "Topping off" / Plans.

The model is simply that of beginning-middle-end moderated by the purpose of the activity or process. In the language models discussed above we can see several instances of the structure at work, and their similarity is due to the general model and not to interchangeability of elements. In the case of the Component model the similarity to other structures is coincidental. For instance, the Instigator actually has a closer correspondence to the Theme in the Textual metafunction than to either the Subject in the Interpersonal metafunction or the Actor in the Experiential metafunction; and it has no correspondence to the Sender/Addresser.

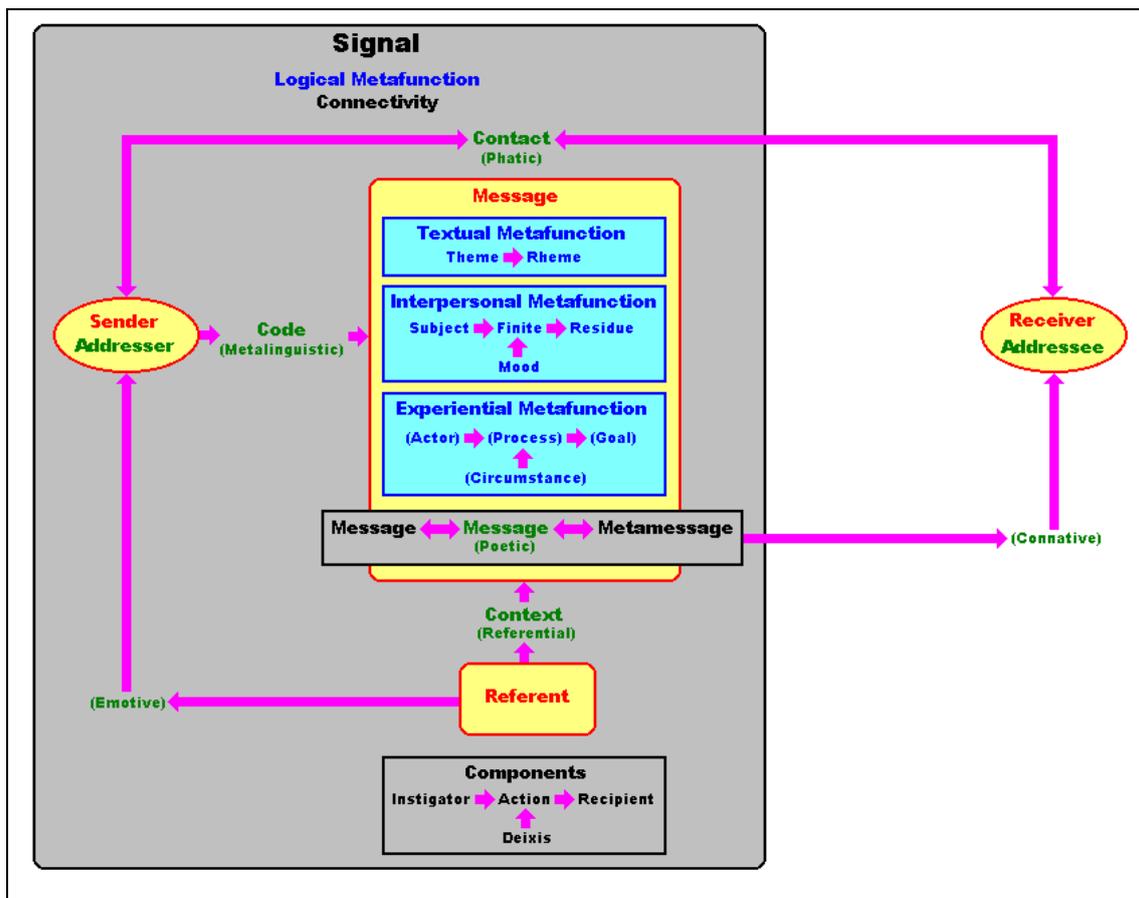


Diagram 4 - A Consolidated Communication Model

All of the models discussed have been brought together in diagram 4. The items in red are the basic semiotics model; the items in green are Jakobson's functions; the items in blue are Halliday's metafunctions; and the items in black are issues raised by this paper. Jakobson's functions have been expressed as relationships while the semiotic, metafunction and component items have been expressed as structures. Halliday's Logical metafunction and the component Connectivity have been identified together: logical interrelationships and connectives share much in common, and they are expressed in many cases by using the same words: *and, or, with, also, but, then,* and so on. Note also the ambiguous nature of the Message-Metamessage structure: this exists both inside the message and "behind" it, in the signal. Jakobson's Poetic function has been identified as the relationship between the component Message

and the Metamessage, as its main role is to identify aspects of the message which function only in relation to the message itself. It actually expresses the Message as a referent to itself, and this is also a function of the Message/Metamessage structure.

There is also a case to be made that the metamessage and phatic functions share common ground, although they have been kept separate in the diagram. They have been seen as the unavoidable extra messages generated by the main message (metamessages) and the intentional non-message communication which facilitates the communication of the main message. These definitions are sufficiently divergent to justify the separate identification.

*Message* is expressed three times in the the diagram: the semiotic Message is the structure of information generated by the Sender and intended for the Receiver; the Jakobson Message is the message as an information carrier from Addresser to Addressee; and the component Message is the intended information generated by the Sender to produce an effect on the Receiver.

The function of this complex diagram is to identify some of the different ways in which the communication process has been analysed by others, and to place the component grammar model into context. It does not provide a definitive model of communication, but it does identify pictorially the issues being addressed in this paper.

## 4. Words

### 4.1. What is a Word?

Despite all the complex definitions, language comes down to two components: lexis and grammar. Grammar has already been defined, but what about words? What are they, where do they come from, how do they work? In this paper the term *word* will be used to describe words, phrases and anything else that holds an agreed meaning. What is actually being described is a *lexeme* or *sememe*, but *word* is a simpler term. Words, therefore, cover a range of semantic phenomena, from morphemes (parts of words that carry meaning, such as the negating *un-*); through words themselves (such as *bird*); through idiomatic phrases (such as *off his duff*, meaning mentally deranged); and into entire paragraphs used to identify objects (such as *Friends, Romans, countrymen, lend me your ears. I come to bury Caesar not to praise him*, used to identify Shakespeare's play *Julius Caesar*).

In its basic form a word is a collection of sounds or glyphs, but that only describes the physical appearance. Words are much bigger things than just sounds. Each of them corresponds to a phenomenon in the world, and that correspondence is agreed by the society which owns the word. Each word is a signal by itself, but they can be combined to make larger signals and complex messages. This combination is, in English, governed by certain rules which require words to be used in a set order according to function. But words are not functionally fixed, and it is an increasing trend for words to move between functions without the addition of functional markers. For instance, the adposition *out* has become a verb (meaning *to reveal the allegiance of*) without the addition of a traditional verb marker (such as *-ise* or *-ate*); and an adjective without the addition of an adjective marker (such as *-ised* or *-al*).

Humans may be the only creature on this planet to actively seek solutions to novel problems rather than just stumble upon them, and this is facilitated by the ability of the human mind to start working on a solution to a problem before it is properly defined. The advantage of this is that we can often hit on a working solution without having all the facts, and it also means that serendipitous solutions to related problems often present themselves before the solution to the main problem. In extreme cases we get sidetracked into pursuit of a problem other than the main problem - if we can't solve the problem set then we set a new problem. This may be a survival mechanism to prevent the mind from spending too much effort on difficult problems with little value. (It could also be the mechanism that breaks down in obsessive behaviour.) But this ability also means that we tend to adopt quick labels to tag our perception of reality, so that we can proceed from definition to solution as quickly as possible.

Thus a word is also a shorthand representation of an associated phenomenon, an abstract coding of reality. It is not real but represents a view of a reality, it is a quick fix that allows humans to summarise a set of properties as the concept they contribute to. But, because the relationship of the word to reality is symbolic, it can be used as an analogy in a related situation; in linguistics we call this ability of language

metaphor. Lakoff and Johnson<sup>50</sup> identify metaphor as a way of creating a common concept system which can even dictate cultural beliefs. People adopt base models for their thought processes and these models affect the way we relate to and comprehend real-world phenomena. For instance, the model life is competitive produces a different form of government to life is cooperative; but there is no reason to presuppose either model as the true one.

The arbitrary relationship between reality and words leads to the ability to create models of non-existent realities – the ability to predict, plan, fantasise and lie. Words are able to convey untruth with equal facility as truth. As Knight says:

An ability to handle fictional representations, then, is the essence of human symbolic competence<sup>51</sup>.

Lexis is a perfect demonstration of this ability. Words get pushed into new forms, new meanings, new metaphors to solve the main problem of communicating the message. But words also carry all kinds of concomitant baggage of meaning from previous use. The use of a word both enhances and expands its meaning, so the socially agreed meaning is constantly being adjusted. A word holds meaning, but it is a shorthand match to reality, incomplete but sufficient. However, the very incompleteness of the match is what gives words such power of meaning when chained together; and the ability to change meaning and function depends on context.

For instance, look at the following three constructs:

- *Time flies like an arrow*
- *Fruit flies like a banana*
- *Time flies like a naturalist*

The structure of all three of these constructs can be:

- Noun (N) + Verb (V) + Adposition (P) + Determiner (D) + N
- or Adjective (Aj) + N + V + D + N
- or V + N + P + D + N

This is caused by the nature of the words used:

- *Time* can be N or V or (rarely) Aj
- *Fruit* can be Aj or N or (rarely) V
- *Flies* can be V or N
- *Like* can be P or V

<sup>50</sup> G Lakoff & M Johnson, *Metaphors We Live By*, chapters 21-25.

<sup>51</sup> C Knight, *Approaches to the Evolution of Language* (ed Hurford, Studdert-Kennedy, Knight), p76.

Thus, in theory, any of the phrase structures given above can be applied to each of the sentences. And yet we know from the meaning of the final D+N exactly what structure applies in each case. We do not know the syntactic structure from identifying the words as parts of speech, we know it purely from the contextual association of the words involved. Meaning has generated syntax!

But where has this contextual meaning come from? Let us look at the Aj+N meanings first. We may well have heard of a *fruit fly* or, if not, we can envisage such a creature. It is a likely possibility from what we know of the nature of fruit and the nature of flies. a *time fly*, however, is not a likely creature: The adjective has no obvious collocation of meaning with the noun. So we are likely to see *fruit flies* as a noun phrase, while *time flies* is likely to be seen as something else. However, the collocation of *fruit flies* and *time flies* actually weakens our acceptance of the usual meaning and introduces the possibility of other forms.

We have seen that *time flies* can have two likely meanings - at least, they are more likely than the Aj+N meaning. These are the N+V and the V+N combinations. In English the N+V combination is much more likely - it fits in with the Subject/Verb/Object order common in English, while the V+N order only fits the command form in English. However, both forms are possible, and it is not until we reach the noun within the adpositional phrase that we can unravel the meaning, by reference to their likely actions. It is intrinsic to the nature of an arrow that it flies, but it is unlikely to be useful as a timing device; whereas naturalists do not fly intrinsically, but they do tend to perform actions like timing flies. Cohen and Stewart describe these areas of probable reality as “spaces” in which the realities are explored and defined, and link them to the human use of analogy<sup>52</sup>.

Of course, the likely meaning is not necessarily the intended meaning, and it may be that there are time-travelling flies with an affinity to naturalists. But would this meaning be seen without further explication or context? It is unlikely.

So far the assumption has been that the constructs are sentences. This is not necessarily the case, there need not be a verb in the construction. If *like* acts as a comparator between two noun phrases then we have Aj+N+P+D+N, which is a perfectly reasonable construction. However, our interpretation of meaning gives this as the least likely of the combinations. The human mind seems to have a preference for constructions with identifiable actions.

So what does this say to us about grammar? It tells us that, in English, words can have multiple functions, and the selection of function can vastly change the meaning of a sentence. It also tells us that we choose between different possible meanings by selecting the most likely and, having found a solution, we are happy to stop analysing. This selection process relies on knowledge of probable relationships between the units of meaning in the utterance; so grammar can grow as much out of meaning as meaning grows out of

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<sup>52</sup> Jack Cohen and Ian Stewart, *The Collapse of Chaos*, pp175-177.

grammar, and to see one as the progenitor of the other is to miss an important relationship.

## 4.2. What does a Word Represent?

A word is a shorthand descriptor of reality but real reality is not what we experience as real. Instead our perception divides what we experience into a series of arbitrary objects. However, since these arbitrary divisions are themselves still too many to allow us to analyse them properly, we take what we perceive and shoehorn it into a series of properties. These properties include simple things like colour, shape, brightness, edges for vision; hardness, smoothness and size for touch; and loudness, pitch, tone and white noise for hearing.

It is possible to describe reality totally in terms of these properties, but it is highly wasteful. Instead we have words for collections of these properties (e.g. cuboid consisting of many thin sheets joined down one side only = book). It is much quicker to have an agreed sound for an agreed object or action than to have to describe it; and speed was essential in so many early human activities, such as hunting. In fact, it could be argued that the words for the properties were created after the words for objects. You can discuss how *big* and *fierce* and *brown* the stag was while sitting around the fire and eating it. “Stag there” is enough to warn your fellow hunters of the presence of the object and, by implication, the intention to hunt it and the desire for them to assist. Indeed, the direct association of sound with a particular event or object is the method of communication used by many other animals<sup>53</sup>.

A word represents an object, and it also represents that object’s particular set of properties. A word is an analogy for a set of mentally-defined properties, which are analogies for a socially agreed object, which in turn is an analogy for a set of real-world properties. This is where the power of metaphor comes from. When we say *people are sheep* we are not associating them with the animals that the word represents, we are associating them with some of the mentally-defined properties that contribute to the word *sheep* (docility, perceived stupidity, herding). We are not associating the people with the socially-agreed object or the real-world properties of that object.

Jaynes<sup>54</sup>, who sees metaphor as the basis of language, divides the process of metaphor into four parts: the metaphier (the device used to create the metaphor); the paraphiers (the associated images generated by the metaphier); the paraphrands (the paraphiers as applied back to the original metaphor); and the metaphrand (the effect the metaphor is supposed to create in the listener). So in *Coke - it’s the real thing*, *real* is the metaphier, *solidity*, *truth* and *reliability* are some of the paraphiers of this, giving paraphrands to create a metaphrand of *product trustworthiness* for Coke. But, as every word is merely a symbol of reality, this

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<sup>53</sup> Jack Bradbury & Sandra Vehrencamp, *Principles of Animal Communication*, ch 13.

<sup>54</sup> Julian Jaynes, *The Origin of Consciousness in the Breakdown of the Bicameral Mind*, ch 2.

process of metaphor occurs with every word we utter.

Every word thus represents a class of objects, which more or less correspond to the properties, which in turn lead to the object concept, which is represented by the word. It sounds circular, and that is because it is. Every word is built into a concept tree of definitions, which we can discover by trying to analyse the meaning of the word. When we think of a word a series of visual and other sensory memories spring to mind. Sometimes these are full pictures, but usually they are incomplete images of properties (some of these images may themselves be words). These then lead on to further properties, and so on until our mind loses interest or the concept tree gets too large. At that point we decide on the meaning and fix it. The fixing process is exploited whenever we produce a pun. The intention is to bias the receiver's mind towards one lexemic relationship, only to reveal a second (hopefully unexpected) relationship. As in:

“My boyfriend went to Hawaii.”  
 “Honolulu?”  
 “No, hon a hairplane.”

It is likely that a concept tree often starts from concepts only vaguely perceived. This means that they are not immediately identified as properties; instead they are barely acknowledged in the conscious mind and *their* properties taken instead. As one of the contributory properties of the property is often the original object concept, this can lead to feedback loops which can cause the tautology of "a table? It's... well, it's a table isn't it." The mental process would go something like this:

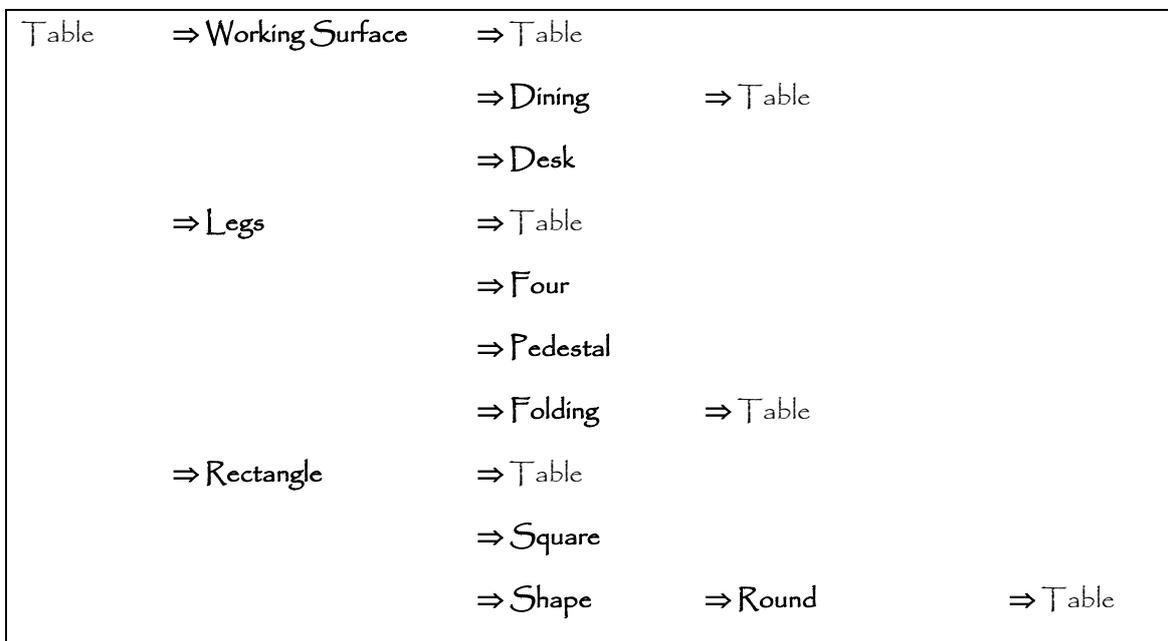


Diagram 5 - How a Concept Tree Works

Every contributory concept has as one of its contributory concepts the concept *table*, so a feedback loop is created that "a table is a table is a table."

Words form a potentially infinite structure which, while not itself real, represents a model of reality held

in the human mind. Words are not images but they tag images both received and retrieved from memory. They are distinct entities but allow for complex interrelationships which in turn allow for metaphor. And this metaphor in turn allows us to appreciate abstractions from reality as realities themselves. We can visualise depression as *feeling down*. We can see time as *before* (in front of me) and *after* (behind me). Colours can be *warm, vibrant, flat*. These are all forms of deixis or analogy – in fact the term *analogy* is almost a synonym for *metaphor*.

It is the power of metaphor which creates the versatility of language. Where we have a component grammar construct of Instigator/Action/Recipient, we can plug a whole series of different Instigators, Actions and Recipients into the roles. The component grammar visible in one signal suddenly becomes available for use in a whole series of other signals – Houston, we have a language.

## 5. Grammar Revisited

### 5.1. Where is Grammar found?

It is time to take another look at the component definition of grammar, with regard to the importance of lexis to humans. To reiterate:

Grammar is the relationship in a message between the Action, the Instigator of the action and the Recipient of the action, allowing for expression of temporal deixis, other deixis, and limited connectivity.

Note *the relationship in a message*: grammar is related to all levels of signalling, all types of message. It is not limited to specific signals or messages. Grammar is not just a function of language it is a function of communication.

We can detect the component grammar of communication directly in language:

- |                   |   |
|-------------------|---|
| ➤ Instigator      | Subject   |
| ➤ Action          | Verb  |
| ➤ Recipient       | Object  |
| ➤ Other deixis    | All over the place – spatial expressions, contexts, descriptors |
| ➤ Temporal deixis | Verb tenses, temporally defined words                           |
| ➤ Connectivity    | Logical operators, conjunctions, intonation, punctuation.       |

However, these correspondences do not map exactly onto traditional grammar structures. Instigator and Recipient are mostly nouns, but can be adjectives or adverbs; Actions are mostly verbs, but include some adpositions and adverbs; connectives include weakening statements, such as *are you sure*, and negators. Component grammar is concerned with establishing semantic roles in the message, traditional grammar is concerned with lexical roles. But, as lexis is reliant on semantic content for function, the two grammars are not unrelated.

The ubiquity of deixis throughout language (and communication) is unremarkable, as much of communication is involved in placing objects onto a mental “stage” for the Receiver to visualise. Setting the scene is a major part of language, and it is most visible in the deaf sign languages, where the Sender actually creates a virtual stage in front of them<sup>55</sup>.

As well as the obvious placement words, deixis includes such things as comparators (the bigger box), colours (the red book), shape (the round window), and any other adjectival or adverbial that differentiates one object or action from another. All of these place the object in space or context in relation to other

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<sup>55</sup> JG Kyle & B Woll, Sign Language, ch 7.

objects. However, deixis can be grouped in different ways. Pinker<sup>56</sup> creates the class of Forces to describe the difference between the adjectival and adverbial functions of deixis.

Without language a large part of spatial deixis in communication is accomplished by pointing. However, alarm calls often contain their own deixis. This is necessary so that the calling animal does not need to reveal their own position by movement, and because line-of-sight is not always available. Vervet monkeys have separate calls for danger from the air and danger from the ground, which cause a response of climbing either down or up the trees. In this case deixis is intrinsic to the message; without it the message is useless.

Temporal deixis is less common. Usually it is not needed as events occur in the present and have to be communicated in the present. However, the process of learning implies an internal time sense even if it is not communicated. When a chimp teaches her child how to pick up termites with a twig there is the expectation in both parent and child that the event being demonstrated is likely to recur in the future. In addition, the mother is calling upon her knowledge of past events to direct her current communication.

To put it simply, conscious memory implies a simple concept of the past; and teaching implies an expectation of continuity into the future. On this basis many animals have a time sense which is implicit to their view of reality. But whether or not they are able to use this time sense in communication remains unproven.

## 5.2. Grammar and Words

The functions of component grammar can be used with and without language, and language has little or no effect on the way they work. So what effect can words possibly have on grammar?

The answer lies in the abstract and metaphorical nature of words – words are symbols as well as icons and indexes. In reality a *swimming fish* and a *grilled fish* are very different objects: at the very least one is an active object and the other is passive. But in language we can recognise the two objects as sharing the common class of *fish*. They share a series of contributory properties of the object concept *fish*, although neither object has a total agreement with all the properties. *Swimming fish* has a much greater correspondence than *grilled fish* to the concept *animal*, while *grilled fish* has a greater correspondence to the concept *food*. Words are not defined solely by themselves but are modified by the other words and nonverbals that accompany them. They are versatile tags and can be used in several different grammatical constructs; most notably in English they can be used interchangeably in the concepts of Instigator and Recipient.

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<sup>56</sup> Steven Pinker, *How the Mind Works*, ch 2.

In addition, analogy and metaphor mean that actions can be seen as objects or deixis, objects can be seen as actions or deixis, and deixis can be seen as actions or objects. Everything is interchangeable. Anger is a deixis of mood, but we can *feel anger*, or we can *anger others*; or *anger can be* a dangerous emotion.

The downside of this versatility is that we have to identify what our words are doing in each case where they are used. It is often simplest to do this with intonation (or punctuation when writing): *Now* spoken with a falling tone is an instruction, with a rising tone it is a question. But often in English we use simple word position to determine grammatical function, such as subject and object: *the cat ate the fish* is very different to *the fish ate the cat*. Other languages use inflections: In Latin *Puella* is girl as Instigator, *Puellam* is girl as Recipient. English used to be an inflected language as German still is; we still have some inflections, especially the pronouns, but these are relict.

A good example of inflection and word order affecting meaning are the phrases *Three baked pies* and *One baked pies*. In the first phrase the noun *pies* is modified by the adjectives *three* and *baked*. But in the second phrase we have a dissonance between *pies* (the plural form) and *one*, which cannot be an adjective of a plural noun. An alternative form of *one* is as a subject pronoun. But this means that *baked* cannot be an adjective either, because pronoun-adjective-noun is not a recognisable English word order. The alternative form of *baked* is as a past tense verb. The change in meaning between the two phrases is drastic.

We have already seen that words can create grammar: word order or word form is subject to rules; but words also create rules in their use. One of these is the incremental power of deixis. Take the phrase *The red book on the top shelf in the bookcase*. We have identified the book we want by colour, by location and in relation to other objects. If there happen to be two red books on the top shelf we can refine our selection as *the lefthand red book*. This uses further deixis to identify the required object, but it has also used *red book* as a shorthand for *the red book on the top shelf in the bookcase*. We can use shared memory to create anaphoric shorthand references, because words allow iterative connection without repetition, meaning that past messages have the potential to be part of a current message. We can even build on existing knowledge left by people long dead without having to repeat their discovery processes. More mundanely, we build our social relationships without the constant need to reinforce them with “social grooming”<sup>57</sup>.

Because words can fulfill several functions, part of the grammar of words is the description of their function: words can be divided into several classes. In his Universal Grammar Chomsky allows for only four categories of lexical items, nouns, verbs, adjectivals and adpositions<sup>58</sup>. But traditional grammar identifies at least eight classes of word:

➤ **Nouns** are Instigators and Recipients, but they also contain deixis of an emotional nature: *Help* and

<sup>57</sup> Robin Dunbar, *Grooming, Gossip and the Evolution of Language*, ch 9.

<sup>58</sup> Noam Chomsky, *Language and Problems of Knowledge*, p68.

*Aid* are officially synonyms, but they hold a subtle distinction; and *Mango* is officially a fruit, but it contains different connotations of taste and worth for different people.

- **Verbs** are Actions, but they also contain emotional deixis. You can *walk* or *creep* or *march*. The first is neutral, the second is furtive, the third is forceful. But they can all describe the same Action as viewed by different people.
- **Adjectives** refine our noun selection from the class meaning of the word: not just *the book* but *the lefthand red book*. They act as spatial, contextual and temporal deixis.
- **Pronouns** act as special shorthand nouns for the Sender and Receiver of a message. They also act as exophoric shorthand references to third parties.
- **Determiners** define the relation of a class word to the class itself. It can be a specific one of the class (the dog), a general one of a class (a dog), a subset of a class (some dogs, many dogs), or even the class itself (dogs). Determiners can also serve a deictic function (this dog, that dog).
- **Adverbs** are a ragbag of words, but they fall into two main groups: deictic qualifiers of verbs and deictic qualifiers of adjectives. The qualification can be spatial, contextual or temporal.
- **Adpositions** are deictic qualifiers which link two objects together to create a new object: *the cake in the oven* links *the cake* to *the oven*. *The day before yesterday* links *day* to *yesterday* to create a new concept of two days ago. Adpositions also create indirect objects: *I'm taking my cat to the vet* makes *the vet* an indirect object to the direct object of *my cat*. Adpositions are one of the most powerful parts of traditional grammar, allowing infinite association of objects to create new objects: *The hat on the cat in the house of the man with the hopes of the world on his shoulders*.
- **Conjunctions** are like adpositions, but writ large. They act between phrases and clauses, creating new ideas from the juxtaposition of existing ones: *I like coffee and tea*; *I went to the kitchen but forgot to put on the kettle*. Like adpositions, conjunctions have a powerful effect upon grammar.

Another way that words create their own grammar is the passive voice of verbs. This has the apparent effect of turning the Recipient into the Instigator: *They bought flowers* becomes *Flowers were bought*, and the object of the first sentence becomes the subject of the second. However, this change is deceptive, we still recognise that the Action of buying is happening to the flowers and not being done by them. *Flowers* are still the Recipient, all that has happened is that the Instigator is unstated. This has led to the view that sentences have grammatical objects and logical objects. In active sentences they are the same, but in passives they are different.

However, it is important to remember that, while the capacity for language appears to be hardwired into our brains, the structure of language is not. We do not pre-own the grammar of words, it is learned as we learn the words. Pinker<sup>59</sup> has shown that the mind seems to deal with regular and irregular inflections differently: The mind first searches a lexicon of exceptions before applying the regular form. For instance, the plural of *child* (*children*) will be pulled out of the exception lexicon while the plural of *donkey* (*donkeys*) will be constructed by the learned English standard rule of “add -s”. But, as the structure has to be learned, it does not have to be the same in all people. For instance, a person who has

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<sup>59</sup> Steven Pinker, *Words and Rules*.

learned Latin may have a variant of the standard rule: “If the word ends in a, add –e, otherwise add –s”. So *formula* is rendered as *formulae*, and a nonsense word such as *tristana* may well be rendered as *tristanae*. This leads to dispute over whether the plural should be *formulae* or *formulas*, and creates phonetic transcription errors such as *formuli*<sup>60</sup>, perhaps related back to other Latin plurals (-us becomes -i). It appears that idiolect may be accompanied by idiosyntax.

Another example of this possible idiosyntax is demonstrated by morphemes. These are parts of words which exist as individual entities, and can be applied to many different words to affect their meaning. For instance, by adding *out-* to *-lying* we create a composite meaning. The negating effects of *un-* and *de-* are good examples of this. Unfortunately, good examples can deteriorate over time as language understanding changes. The original meaning of *awful* has mutated to the point that *aw-* and *-ful* can no longer be considered separate morphemes – the sum of the parts no longer adds up to the whole. This process of change is continuous, so many words are likely to be undergoing transformation at any one time; and, at any one time, different minds will consider a word as morphemically whole or separable. For instance, the word *afternoon* appears to be undergoing change at present, in that it is used to mean after lunch, or after a dividing point in the day unrelated to noon. This is part of the process of Grammaticalization, whereby words and structures in a language change over time, eventually creating apparent discontinuity between the old and the new.

So, while traditional grammar can be considered a statistical phenomenon, and general rules can be imputed from majority usage, it is not a definitive guide to language production. Modern linguists quite rightly condemn the imposition of a prescriptive set of rules on language users as counter-productive; but we should also recognise that the rules we use to study language usage are modalities, and not laws until proven to be so. Cameron describes the process of establishing language rules in use as Verbal Hygiene, to emphasise its importance as the necessary face of prescriptivism<sup>61</sup>.

### 5.3. Grammar beyond Words

The grammar created by lexis is so powerful that it can even exist without recognisable lexical units. If I say *the shing of grud mand drobly the hablob*, there appears to be meaning behind the sub-words used. There are only two recognisable words, *the* (twice) and *of*. But, because we recognise certain grammatical relationships we can make reasonable assumptions about the nature of the sub-words. *The* is always followed by a noun or adjective, but an adjective is not followed by *of*. So *shing* must be a noun. *The a of b* is a common construction in English, where *a* and *b* are both nouns, so it is very likely that *grud* is a noun, too, making a single noun phrase. At the other end of the sentence, *the* has to be followed by a noun phrase. As this consists of only one word, *hablob* has to be a noun. In English the initial noun phrase of a

<sup>60</sup> Used by a colleague in Haringey IS/IT department, even after being told of the conventional form.

<sup>61</sup> Deborah Cameron, Verbal Hygiene.

sentence forms the subject and is usually followed by a verb, so *mand drobly* is probably the verb phrase. This would make *mand* and *drobly* a verb and adverb. In theory each could be either – English word order in this case is not fixed – but the *-ly* ending of *drobly* is a common adverbial suffix. This means that *mand* is most likely the verb.

This is not the only way that the sentence could be analysed. We could consider *grud mand* as an adjective and noun, making *drobly* the verb. But the *-ly* ending is a powerful grammatical (and lexical) indicator which mitigates against this interpretation. A third analysis of *mand drobly* is that *mand* is an auxiliary verb and *drobly* is the lexical verb. But while the set of auxiliary verbs is large it is a closed set, and *mand* is not a member. This would be an unlikely choice of grammar (and meaning) for the lexis. In fact, the *-ly* ending is so powerful at indicating an adverb that we accept it as such, despite the fact it is in an unusual (some would say wrong) place in the construct.

This “nonsense translation” effect is possible in every language: a string of nonsense interspersed with a few key connective and deictic words (adpositions and conjunctions) can appear to make correct but untranslatable sentences. The power of grammar in the mind is so powerful that it tries to create meaning even when none is present. Think of the powerful visual images generated by:

‘Twas brillig, and the slithy toves  
Did gyre and gimble in the wabe.  
All mimsey were the borogroves,  
And the mome raths outgrabe.<sup>62</sup>

What does this show? First, it shows that humans seek meaning and language in sound or letter combinations. This is why the Yellowhammer’s song is bizarrely heard as *little bit of bread and no cheese*<sup>63</sup>, and many pet owners insist their animals are able to talk. Second, it shows that people do use rules to analyse new language constructs, rules they have evolved from their other contacts with language. But, as these rules are idiosyncratic, there is no guarantee that everyone will analyse a new construct in the same way; instead, they will select a syntax and often be blind to alternatives. This is the process that creates unintentional language gaffes, such as the WWII headline “Monty flies back to front”.

## 5.4. Phrase Structure Grammar

Phrase Structure Grammar was evolved by Chomsky as an attempt to analyse language according to a set of simple rules. We have seen that in English some types of word go together, and we have seen that word order and function are important. It should be possible to bring these ideas together into a single theory, and this is what Phrase Structure attempts. It is a top-down approach which allows us to see

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<sup>62</sup> Lewis Carroll, *Through the Looking Glass*, ch 1, Jabberwocky.

<sup>63</sup> *Book of British Birds*, p86.

English not just as words but as nested structures.

For instance, we know that determiners (D) and adjectives (A<sub>j</sub>) only occur with nouns, so we know that they form part of a noun phrase (NP). Similarly adverbs (A<sub>v</sub>) occur with adjectives, so they form part of an adjectival phrase (AP). Conjunctions join sentences or similarly typed words, so can be virtually ignored for the purpose of phrase analysis. Starting from the top, we know that a sentence (S) consists of a noun phrase and a predicate, which Chomsky called a verb phrase (VP); and the verb phrase consists of a verb (V), a direct object (NP) and an indirect object (adpositional phrase (PP), or adposition + noun phrase (P + NP)).

And that, basically, is that. Allowance must be made for iteration (repetition of forms within forms – another use of conjunctions), but otherwise English phraseology has been summed up in a few simple formulae:

- S = NP+VP
- NP = D+AP+N
- AP = A<sub>v</sub>+A<sub>j</sub>
- VP = V+NP+A<sub>v</sub>+PP
- PP = P+NP

However, English has the ability to create idioms out of commonly used phrases, and one of these idiomatic forms is the phrasal verb. In this form the adposition becomes detached from the noun phrase and attached to the verb. Sometimes a phrasal verb is easily identifiable, as when two adpositions occur together. In *I'm going up in a balloon*, *up* attaches to the verb *go*, while *in* attaches to the noun phrase *a balloon*. But at other times it is not so clearcut, as in *I'm going up the stairs*. Does *up* attach to the verb or the noun? The simple answer must be that it depends who is making the choice – which idiosyntax is judging the construct. Sometimes the adpositional phrase is unclear, although its presence is indisputable. For instance, what is the difference between the dialect constructs *I'll tell her it* and *I'll tell it her*? Both mean the same thing; both have the same person being told and the same thing being told. Do we assume the first meaning is *tell her about it*, while the second is *tell it to her*? Or do we assume that *tell* is actually two lexemes (*relate it* and *inform her*), which have become intertwined because of their equivalent phonology? Or do we take the view that language structure is unrelated to meaning structure?

These choices creates difficulties for Phrase Structure analysis. Take the common learning sentence, *the cat sat on the mat*. This can be analysed as:

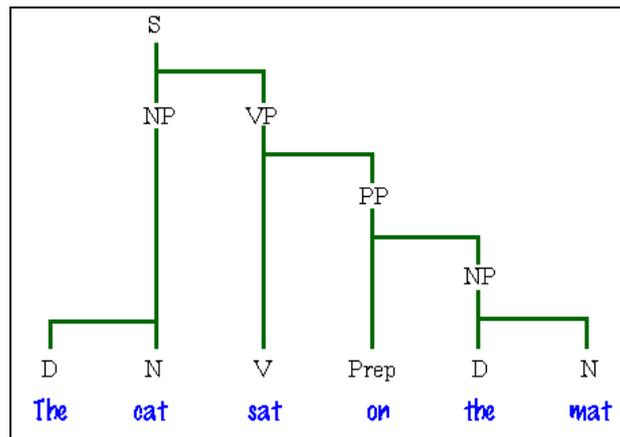


Diagram 6 - Phrase Structure Analysis – Traditional

or:

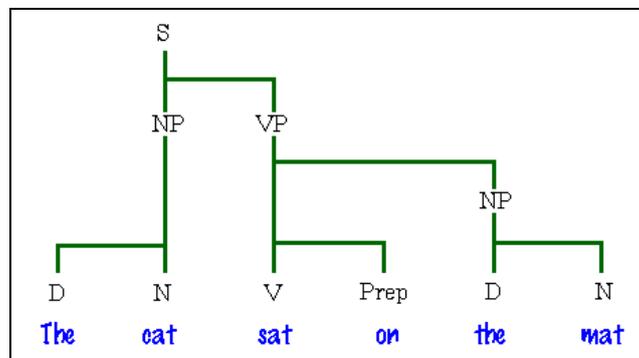


Diagram 7 - Phrase Structure Analysis – Phrasal Verb

If we could identify whether *on* stays attached to *sat* or *the mat* in other structures then we could decide on the intent of this construct. Unfortunately, analysis of variant forms does not help.

**Question form:**

*What did the cat sit on?*

*On what did the cat sit?*

Both are considered valid today, although the first ends in an adposition (prescriptively forbidden by the Reverend Robert Lowth) and the second sounds archaic.

**Passive form:**

*The mat was sat on by the cat*

*On the mat was sat the cat*

These are different constructions with subtly different meanings - *the mat* is emphasised in the first, and *the cat* in the second. The first has a direct subject and no direct object (standard passive), while the second has a direct object and no direct subject (intransitive passive). This is to be expected from the two possible original constructs. However, as both constructs are valid they do not help us in deciding how to analyse *the cat sat on the mat*.

**Added adverb:**

*The cat sat quietly on the mat*

*\*The cat sat on quietly the mat*

This appears to be a differentiator, but it is caused by a general relationship between a verb and a direct object, and not a function of the adposition. The relationship is that an adverb is rarely placed between a verb and direct object, as in:

*\*Fred hit hard his sister*

An adverb can, however, come between an intransitive verb and its indirect object, as in the first construct.

**Verb conjunction**

*The cat sat and mewed on the mat*

*The cat sat on and mewed on the mat*

The second is less likely, but has to be used where the conjunction changes: *the cat sat on and looked over the mat*. But, once again, both constructs are valid.

**Noun conjunction**

*The cat sat on the mat and on the floor*

*The cat sat on the mat and the floor*

Both are acceptable, although the first may contain an aspect of temporal deixis, indicating that the actions may be serial where the second actions could be simultaneous. But this differentiator is very weak, and the two constructs are largely the same.

It seems that both of the phrase structures given above are correct, and it is possible for different structures to be in the minds of the sender and receiver without compromising the message. To label one of the structures as definitive would be prescriptive, as the mental structure has no significant effect on the meaning of the message.

What this shows is that care must be taken when assessing models of language. Models are extractions from reality; often they are summaries, or “most cases” analyses: they do not reflect the full range of language constructions possible in the full range of human minds<sup>64</sup>.

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<sup>64</sup> See *The Balancing Act*, Klavans & Resnik, for more detailed discussion of the statistical nature of comprehension, especially Stephen Abney, ch1.

## 6. A New Model of Language

### 6.1. Signals Revisited

As Chomsky points out, Grammar and Lexis are the two bases on which language stands. Virtually all communication contains component grammar, and communication is endemic through nature. But simple communication does not require the complex mental baggage of words – indeed, it works better without it. Language, on the other hand, does require words, and the relationships between words require extra grammar to control the lexis. There seem to be two different types of grammar at work in language.

The vast majority of nonhuman signals are deictic. The simplest signals can be summed up as:

- **Level 1**      I am here
- **Level 2**      I am feeling
- **Level 3**      I recognise you
- **Level 4**      Notice it

The first two signals have the first person as the object, the third has the second person, and the fourth has the third person.

More complex signals involve a complex grammatical relationship between first second and third cases, and time and place. We would express the bee dance as *I found food 300 metres away towards the sun at midday, and there is lots of it*. It involves Action, Instigator, Recipient and deixis (equivalent to verbs, simple nouns and adjectival phrases) - and a possible temporal-deixis relationship that we still do not fully comprehend.

It can be argued that what is happening in these signals is not a function of grammar. But then, what is grammar? Something is going on that allows events and objects to be placed into a model of reality, and allows that model to be faithfully transmitted between minds. To exclude nonhuman communication from grammar we have to find a way of differentiating between the vervet monkey warning and the English phrase "Look out!" It is unlikely that a differential could be found which could not also be drawn between the English phrase and the French "Attention!"

Thus, in signals we find all the necessary requirements for grammar: identification of Instigator, Action and Recipient; deixis; and iteration. If we look at one of the most complex communication procedures that most animals indulge in (mating) we can identify all kinds of grammatical structures in the signals given. Mating procedures involve statements about the chooser and the chosen; they can involve displays with third parties as well as between chooser and chosen; and they involve connective logical transfers (I'm a good mate because my tail is magnificent, which means I feed well, which means I survive well, which is what you want for your offspring). These logical transfers may happen at the instinctive level,

but they represent conclusions drawn from unrelated statements and, more importantly, they are triggered by complex messages passed from sender to receiver.

Yet there is definitely a difference between human language and other communication. Humans use arbitrary symbols to represent reality, and those symbols are themselves reusable to represent different realities. Words can represent anything we wish, as in the current antonymic use of *wicked*, or *wonderful* when uttered sarcastically. A message involving words changes the rules by which the Receiver decodes the message, and introduces a vastly greater level of metamessaging into our communication.

The metaphoric power of words allow us to represent temporal deixis by analogy with spatial deixis, and to construct speculative models of reality. We can fantasise and attempt prediction of the future; we can dream and plan. Jaynes<sup>65</sup> even says that much of what we think of as our consciousness is a product of language, and not a precursor of it.

## 6.2. Chomsky's Universal Grammar

For decades Chomsky has maintained that there is within humans a propensity towards language, and that this propensity is innate. He also postulates that the linguistic signal produced has only an indirect relationship with the message intended in the mind of the Sender, and the message goes through a set of transformations to change it from thought into a signal.

Chomsky's theory is based around two human abilities both of which, he argues, must be inherent to our nature.

- The ability to learn language is not itself learned, it is innate. Chomsky labelled this ability the *Language Acquisition Device*, or LAD. Children do not learn their mother tongue by example, most of the rules of the language are already expressed in the LAD. Only the vocabulary and the surface structure of the language need to be learned.
- The innate rules of *all* languages are the same, as different children learn different mother tongues with equal facility. There is no significant difference between the LADs of different children, any more than there is a significant difference in seeing, hearing or smelling. This universality is created by Universal Grammar, as all humans have the same basic linguistic grammar.

From these two theses Chomsky built his model of universal syntax. The rules generated by the LAD he labelled *Deep Structure*, and the rules generated by the surface grammar of language he called *Surface Structure*. However, there are two other components to human language: the production of language by sound (writing is just an iconic representation of sound), and the message within the utterance. The first

of these Chomsky called the *Phonetic Interpretation*, and the second he labelled *Semantic Interpretation*.

Chomsky then went on to divide the Deep Structure into two components: the grammar rules, or *Phrase Structure*, and the *Lexicon*. He also placed a mechanism between the Deep Structure rules and the Surface Structure rules to translate between them, and he called this the *Transformational Rules*. Finally he placed rules between the Surface Structure and the Phonetic and Semantic Interpretations, calling them the *Phonological Rules* and the *Semantic Rules*. This gives the structure in the Standard Theory diagram.

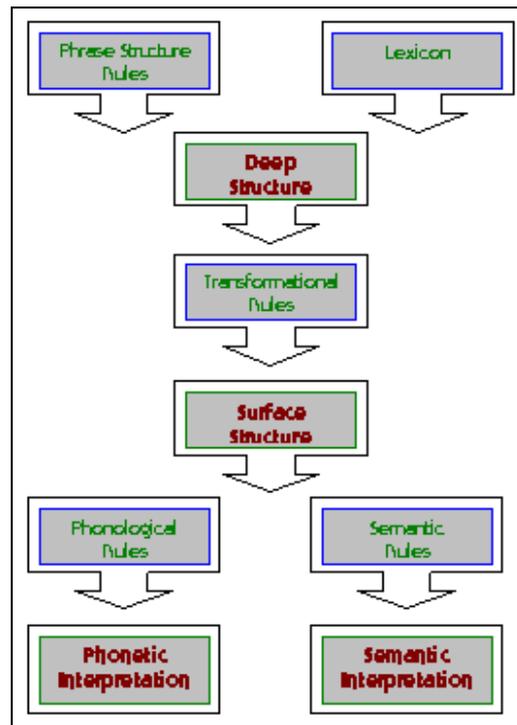


Diagram 8 - Chomsky's Standard Theory of Grammar

From the diagram it appears that grammar structures precede and determine the Semantic Interpretation: the production of grammar precedes the production of meaning! This is clearly silly, and Chomsky himself has pointed out that his model is not procedural, it does not say that a occurs then b. It is structural: meaning will always precede grammatical construction. But the production of a Semantic Interpretation depends on Surface Structure, which in turn depends on Deep Structure. Indeed, to see the Standard Theory of Grammar in a procedural way is to introduce mental calculation into it, and Chomsky's whole thesis is built upon the essential instinctiveness of language.

Chomsky posits that a large proportion of our grammar is dictated by our internal Universal Grammar engine. When we say *the man with the big nose has a dog* we are actually going through a process of sentence building which is mostly innate. To overcome the problem that the French would say *nez gros* (nose big) and the Germans would say *ein hund habe* (a dog has) he posits that in learning a language we discover certain word-type orders (adjective before or after noun, verb after subject or object, etc) which

<sup>65</sup> Julian Jaynes, *The Origin of Consciousness in the Breakdown of the Bicameral Mind*, ch 3.

set "switches" in our Universal Grammar engine. These switches then dictate not just their own relationships but other relationships in our comprehension of language.

But what about:

- Really this is the best way
- This really is the best way
- This is really the best way
- This is the best way really

Are we saying that there is no rule (no switch) in English for the placement of the adverb? But what about other languages with more strict adverbial placement? Has the switch somehow got left on neutral for English-speakers? And what about the officially wrong (but used) form *This is the really best way*, where the adverb appears to have been pressed into service as an adjective? Also there is the problem of adverbs that change meaning depending on placement: *He simply did it* does not have the same meaning as *He did it simply*.

English is full of poetic phrases which break our rules. Many of them are archaic references, like *Walk upon England's mountains green* instead of *green mountains*; or foreign imports, like *Eminence Grise*. Why do these forms survive in the face of an "innate" need to correct them? And why do we continue to create new word orders? A recent addition to our language is the construct *For What?* meaning *What do you want it for?* If this was a simple ellipsis then we would use the form *What for?*, which is fully acceptable and has been around for years.

Chomsky's Deep Grammar is not just innate but universal, which means that a single mechanism must be at work in all humans. As the mechanism is the same it means that everyone's understanding of language is the same, and the rules by which we convert thought to utterance should follow a well-trodden path. This, in turn, implies that the similarities in the Surface Grammars of our various languages should be much greater than the differences. Is this really the case? It appears from the vast number of ways we can express the same message even in a single language that something learned, even personal, is going on.

The fact is that a lot of human communication does not appear to follow a full set of Surface Grammar rules, yet the message in the communication is clearly received. Take the following telephone conversation (the telephone has the advantage for linguists of voiding all non-vocal communication, so creating a model easier to analyse):

- A: Hello.  
 B: Sorry... uh... Philip?  
 A: Philip's out. Should be back... uh... half-hour? Want to give him a message?  
 B: Uh... when's he back? Uh... I'll ring... tell him I rung.  
 A: Try again, say, oh, an hour?

B: OK. Tell him I rung. Bye.<sup>66</sup>

B's second utterance is an interesting logic jump. B has responded to the question about leaving a message by ignoring it and, after a false start, presents two alternative actions for A to follow. A chooses the first alternative, which B acquiesces in, but reiterates the second option. At the end of the conversation the expectations placed on the two parties are clear: A is to tell Philip about the phone call while B is to ring back in about one hour.

Chomsky would tell us that a deep grammar has been constructing the utterances while a surface grammar has been mangled in the production process. Yet messages have been successfully transferred where Surface Grammar is not a significant factor in the message. So the question must be asked, what is the significance of Surface Grammar in communication, if any? Can there be language without Surface Grammar? And, if it is not needed, why does it exist? What does it give to language that is not already given by Deep Grammar?

It is clear that there are some universals in human languages: Nouns and Verbs, and the Subject-Verb-Object construction (although not necessarily in that order). These definitely point towards some form of universal basic structure. And then there is the LAD, sitting at the source of Chomsky's theory of Grammar. These are difficult things to refute, and indicate that Chomsky's theories are soundly based.

But what if the deep roots of grammar lie outside language, in an earlier state of communication? Chomsky seems to take the view that grammar is a product of language, and developed alongside it. Somehow we changed from creatures with no grammar to creatures with a complete and rich grammar, able to express everything we could ever want - and not want - to say. But it seems likely that component grammar had to have existed before language to give lexis a base on which to build. A second level of grammar then evolved from the lexis itself, which extended the strategies available in language exponentially – possibly infinitely.

It seems that component grammar is not just a human attribute, it has evolved in the brain and with the brain as a function of communication. The difference between human and other animal grammars is therefore likely to be qualitative and not absolute. Most animals appear to have mastered simpler levels of signal, and more complex levels of signal are far from uncommon. They seem to be used in loose social structures, and by species which train their young; and where specialist roles are adopted then the ability to signal deictic and temporal relationships becomes extremely useful.

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<sup>66</sup> Personal record of a telephone conversation.

### 6.3. From Universal Grammar to Component Grammar

When looking at models of words and grammar working together in language we see a growing sophistication, leading up to Chomsky's transformational model (diagram 8). However, the Chomskyan model reflects a sophisticated view of language which relies on a complex set of assumptions. It may be better to return to a simpler view of language, and work upwards from there. It is clear that language is divisible into words and rules, lexis and grammar, the relationship of which is most simply shown in the diagram below:

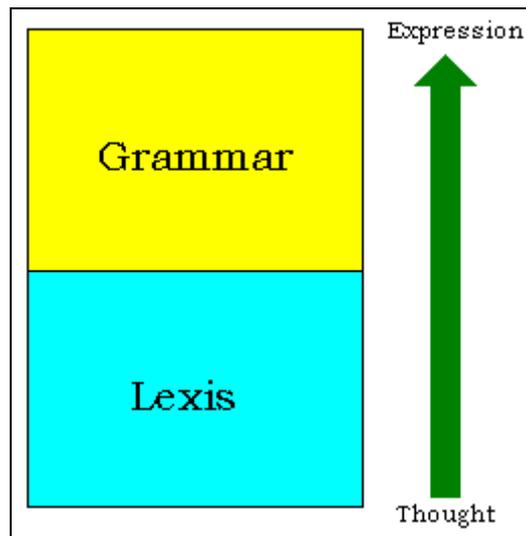


Diagram 9 - The Simplest Model of Language

This is the traditional view of the process of language production. A set of words are chosen to match a particular thought, the words are modified and arranged by the introduction of grammar, and a formed utterance emerges as communication. The problem with this model is that language becomes a totally learned experience. Lexis, we know, has to be learned – languages use different words for the same items; a genetically inspired lexicon would be virtually the same in every language. In fact, of their nature, words have to be learned: they are arbitrary symbols and analogies which do not retain the same values in a single lifetime, let alone in a single species. But if lexis has to be learned then it is likely that the grammar reliant on that lexis also has to be learned: a fixed grammar cannot deal with an infinitely variable lexis without imposing absolute strictures upon it. And it is evolutionarily unlikely that a costly mechanism such as the use of symbols should evolve without having an expressible purpose.

So, if grammar has to be learned, we should see it varying between languages – and this is what we see in the real world. However, there seems to be an underlying commonality of function between all languages which tends to indicate a common engine driving them all. In every language we see things doing things to other things; we see these events being limited by temporal, spatial and contextual constraints; and we see the events being related to other things or events. Where does this commonality come from?

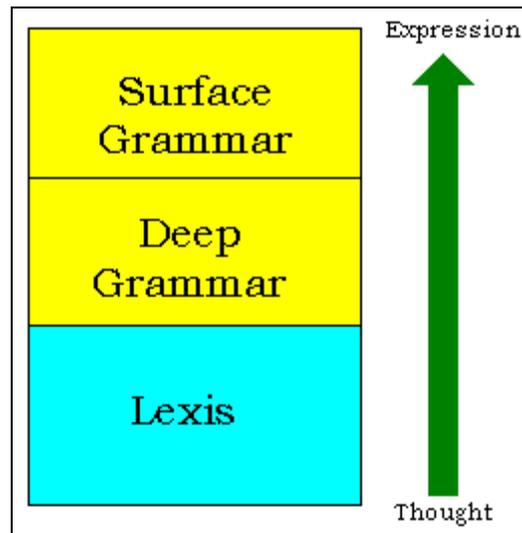


Diagram 10 - Differentiation of General and Language-specific Grammars

In diagram 10 we see grammar subdivided into Surface and Deep Grammar. This allows for one set of rules (Deep Grammar) to be common to all humanity while a second set of rules (Surface Grammar) correspond to idiosyncratic usage. Deep Grammar makes language a potentially communicable device between all humans; while Surface Grammar explains the large variations between languages. The implication is that we name everything we wish to formulate into a message, then we identify how the named things work together, and finally we encode the resultant model into a formed utterance. However, this diagram has one flaw: Deep Grammar sits on top of the infinite variability of lexis and, as a fixed set of rules, it must act as a brake upon that variability. We have a layer of universal fixed rules fitting between two layers of idiosyncratic variable rules, and controlling the whole process.

While the previous model appears superficially similar to Chomsky's Transformational model (diagram 8), there is one important difference between the two: the Transformational model is an identity model, it identifies components without necessarily indicating an ordered process; the model above is a process model, indicating the order in which things occur. However, the Transformational model does recognise that the effect of Lexis upon Deep Structure must be moderated in some way, and it does this with the Phrase Structure rules. If the Transformational model was expressed as a process it would look something like this:

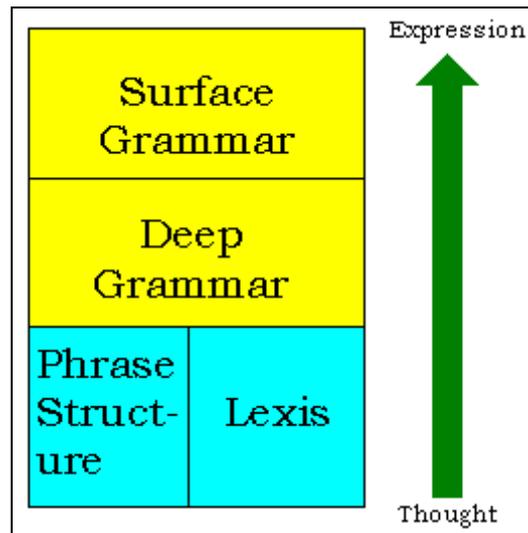


Diagram 11 - Chomsky's Transformational Model as a Process

Here we see Phrase Structure rules and Lexis being moderated into an I-language<sup>67</sup> (Internal Language) by Deep Grammar, and then transformed by Surface Grammar into an utterance. Presumably the I-language form, if it could be expressed, would be grammatically similar for all humans, although the lexis itself would vary. But this does leave the question: what use Surface Grammar? It would appear only to obfuscate the message, which sounds counterintuitive. In addition, this model still does not address the issue of a fixed Deep Structure limiting a variable Lexis; and, as discussed earlier, the descriptions of Deep Grammar and Phrase Structure remain elusive, despite determined efforts by linguists.

In diagram 11 we see the separation of lexis and grammar, theoretically the two defining features of any language. We also see the division of grammar into general and specific rules. The two forms of grammar are placed together and seen to function together, but is this necessarily the case? It would seem more intuitive to place Lexis and Surface Grammar (the two variable items) together in any process, probably at the top of the diagram where they are closest to expression. We can order these two elements uncontroversially, with grammar on top of lexis – this is the structure in all the models above – and place the remaining two elements (Deep Grammar and Phrase Structure) at the bottom of the diagram. But, in this case, the question arises whether there is a need to differentiate between Deep Grammar and Phrase Structure. Could a single form encompass them both?

<sup>67</sup> Noam Chomsky, *The Minimalist Program*, pp16-17.

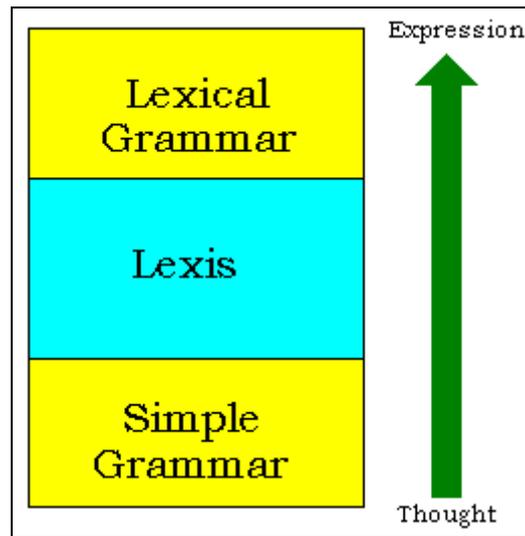


Diagram 12 - Lexis Within Grammar

Here we see the result of the reordering, with Lexis sitting between two layers of grammar. The upper layer of grammar is learned, variable, and idiosyncratic, the same conditions that apply to lexis. It is reliant upon lexis for its form, and has therefore been labelled Lexical grammar. The lower layer is instinctive, fixed, and species-invariant. It is the way in which the human mind divides up the world to allow for nomination and symbolic representation, and it has been called Simple grammar to reflect its basic nature. This three-part model meshes well with Hirsh-Pasek and Golinkoff's Coalition Model of Language Comprehension. In this, a child's early language learning is divided into three phases: extraction and acoustic packaging; segmentation and linguistic mapping; and complex syntactic analysis<sup>68</sup>.

Phase	Approx Age	Dominant Process	Form of Representation (1)	Form of Representation (2)	Language Comprehension	Language Production
I: Extraction and acoustic packaging	0-9 months	Internalization	Acoustic correlates of linguistic structure	Image schemas (not propositional)	Some words	Few, if any, words
II: Segmentation and linguistic mapping	9-24 months	Internalization and interpretation	Words, some early grammar	Propositions; cuts becoming language dependent	Syntactic, when redundant cues from context, semantics and prosody coincide	Prototypical transitive and intransitive sentences, often incomplete
III: Complex syntactic analysis	24-36 months	Interpretation	Heirarchical representation of linguistic structure	Propositions; language dependent in nature	Syntactic, even when redundant cues fail to coincide; can compute interclausal relations	Complete sentences, variety of structures

Diagram 13 – Hirsh-Pasek &amp; Golinkoff's Coalition Model of Language Comprehension

One advantage of the model (diagram 12) is that it allows for an evolutionary development of simple forms of communication into language. The development path has no need for sudden evolutionary change (as is required by the Transformational Grammar model), and may go something like this:

Internal event	Communication Event
Knowledge of simple cause and effect	Herd relationships
Model-building from that knowledge	
<b>SIMPLE GRAMMAR</b>	Training of young
Identification of events and individuals	Social grouping
Nomination and Icons	Alliances of individuals
Expression of spatial relationships (deixis)	
Expression of contextual relationships (deixis)	
Concept grouping and Indexes	Macchiavellian behaviour
<b>LEXIS and Symbols</b>	Human Society
Expression of temporal relationships (deixis)	
Expression of event relationships (connectivity)	
<b>LEXICAL GRAMMAR</b>	

Diagram 14 – Speculative Evolutionary Development Path using Component Grammar Model

It is possible to argue that many of the features in the list occur in other species. Most mammals would appear to be able to use Simple grammar as a non-communication process: maze-solving in rats is not a natural process, but they seem able to use their evolutionary models to solve new problems. In monkeys we see solutions to novel problems being taught to others in the tribe. In primates we see much of their life-knowledge being acquired through training, and we also see the ability to grasp and use the basic concepts of human communication, although not full language. In fact, the only relevant difference between us and our close relatives would appear to be our ability to use symbols to represent the world. But what an ability! It enables us to develop analogies, which allow us to build models to speculate upon the nature of the World and not just its events. Basically, it allows us to solve problems we do not yet have.

Identifying the symbolism of lexis as the human differentiator has an added advantage. It could be argued that the developments after lexis are realisations and not adaptations, memetic and not genetic. Of course, this model does not address the need or willingness of humans to share their knowledge, which would appear to be a product of socialisation.

However, the model transformations are not quite complete. One final change can be made to the model, as follows:

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<sup>68</sup> Kathy Hirsh-Pasek & Roberta Michnick Golinkoff, *The Origins of Grammar*, ch7.

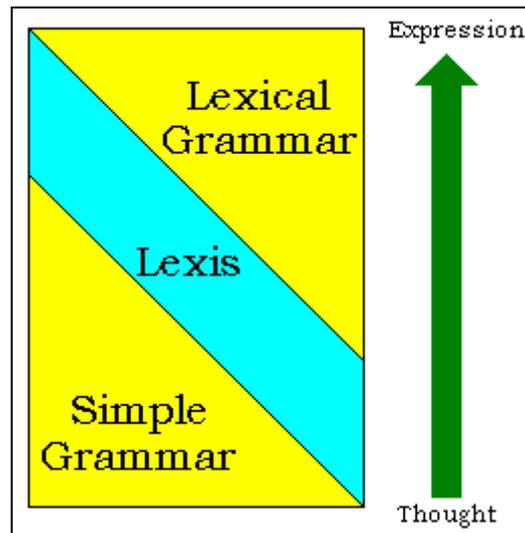


Diagram 15 - Lexis Within Grammar as a Gradation

It appears that the only transformation here is the slanting of the lexical box. But the significance of the slant is that it places the model in a continuum, as the following diagram demonstrates:

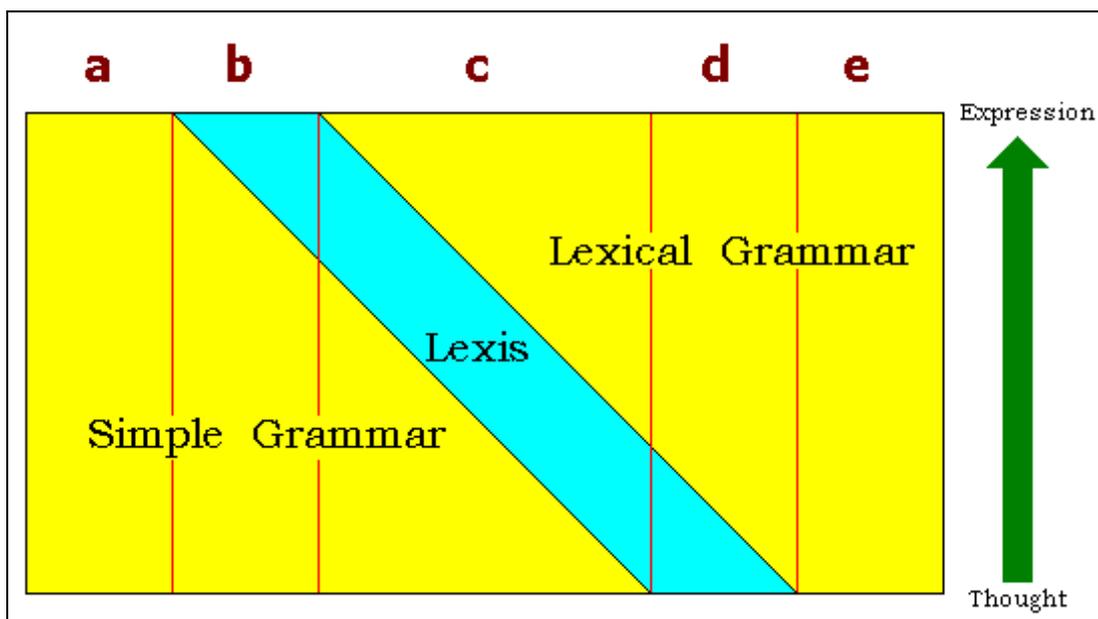


Diagram 16 - The Component Grammar Process Model

#### 6.4. Component Grammar Divisions

The argument presented by the above diagram is that grammar comes in two flavours: Simple and Lexical. Simple grammar is the understanding of who is doing what to who, with what, where, etc.; it is a prerequisite of communication and is present in virtually all messages, human or not. Lexical grammar is a product of the way words work, which means that it is a product of the human attribute of language; it is

the imposition of structure on selected words by amending those words or adding new words. Grammar is not just about the process of adjusting language (lexical grammar), it is also the expression of interrelationships of things in the message (simple grammar).

Language is a strange thing. Not only do we use it for communication, we use the power of its metaphor for many other mental processes. Much of our reasoned logic (as opposed to our “common sense”) uses grammatically-based constructs: equality, inclusion, exclusion, grouping, all are functions of grammar, mostly expressed lexically in connective words and adpositions.

In answer to the question "Are you related to Fred?", the responses "Yes, he is my father" and "Yes, I am his son" are synonymous. This is because the phrases *my father* and *his son* are two ends of a logic construct, and when one end is explicated the other is automatically implied. Similarly the comparator "I am taller than yesterday" implies that I was shorter yesterday than I am today. It also implies that there was a day before today that I can access for comparison.

Simple grammar has several features anchoring it in the real world. It uses real objects and actions, and establishes real relationships. The set of realities it uses is limited, as follows:

- **Instigators**                *me, you, it.*
- **Recipients**                including *me, you, it, food, friend, foe;*
- **Actions**                    like *come, go, move, hide;*
- And a very few emphatics and descriptives.

A notable feature of simple grammar is that it does not need nomination, and the few Actions that need to be communicated can be indicated by tone of voice and physical signals. The objects involved can be pointed at. With real objects the stage is fixed, the relationships are stable. The function of an object is holistically included within the object, so the Instigator and Recipient relationships are already established. But once lexis is used the established relationships break down, and a new level of grammar is required.

Lexis means icons, indexes and symbols – that is, words; and words are at one or more removes from reality. The word *apple* (when used to label an apple) is not an apple, it is a tag for a real object that, *in the mind of the message sender*, has sufficient correspondences with the attributes of a real apple. This is important, because the word contains no automatic agreement between sender and receiver about what the word represents. Words are concepts about reality, and those concepts do not necessarily correspond with the functions of the reality. For us, Newton was hit on the head by an apple, but in reality he was hit on the head by a hit-on-the-head-thing. If he then picked up the hit-on-the-head-thing and bit into it, it would have become a food-thing, and so on.

When using words, reality ceases to be fixed, and Instigators and Recipients become interchangeable. For

example, take the three concepts *Janet*, *John* and *hit*. These can be combined in four ways: *Janet hits John*, *John hits Janet*, *Janet and John hit*, *Janet and John are hit*. *Janet* and *John* can both be the Instigators or Recipients in the Action of hitting, so we need some way to indicate who is doing what to whom. In English we do this with word order and auxiliary words. So these rule structures are features of English lexical grammar.

Lexical grammar is therefore purely a product of lexis, of words. By naming things we abstract them from their direct deictic relationship with reality, and divorce them from their associated real actions. This nature of words gives them tremendous power - we can use them to indicate absent and even non-existent things - but it comes at the cost of a complex grammar to re-establish the lost relationships.

It also seems likely that simple grammar is innate and not acquired. If it is innate then it must have correspondences across all human languages. Thus the same forms (noun, verb, qualifier) can be seen across all human languages - and their component equivalents can be found in nonhuman communication, too. The set of component grammar functions is small and closed, whereas lexical grammar has all kinds of non-universal forms that can be found in one language and not another.

The correspondence between Chomsky's Deep and Surface Grammars, and the simple and lexical grammars described above, is more than coincidental. However, Chomsky's model sees a complete structure of Deep Grammar underlying a complete structure of Surface Grammar. The component grammar model sees simple grammar underlying a lexical layer, on top of which the lexical grammar rests. The lexical layer represents the actual vocabulary of words, the object concepts behind the words, and the relationships between them.

In diagram 16 above, the slanting lexical layer means that it neither totally overlies simple grammar nor totally underlies lexical grammar. This gives five relationships in the model between grammar and lexis, labelled by the letters a to e.

- ***Simple grammar alone***. This is non-language communication, as used by nonhumans and humans alike (frowns, smiles, subvocalisations, etc.) This involves the communication of relationships without the use of symbols.
- ***Simple grammar through a lexical layer***. This consists of simple word form messages without apparent grammatical content but with clear meaning (such as *You! Here! Now!*).
- ***Simple grammar through a lexical layer, with lexical grammar overlaid***. This is where the majority of human linguistic communication occurs. To take a simple form, the expression of Instigator/Action/Recipient is expressed through an English lexical layer as Subject/Verb/Object using words, as in *Janet ignores John*.
- ***Lexical grammar with an underlying lexical layer***. This is where the process of hypothesising occurs, where ideas unrelated to reality come from. This is also the area where metaphor is generated, as words are processed through lexical grammar to take on new meanings and,

occasionally, new grammatical functions.

- **Lexical grammar by itself.** This is the area of grammatical nonsense, and is not a good message conveyor. We see this happening in nonsense poetry (*'Twas brillig, and the slithy toves did gyre and gimble in the wabe...*); in the medical condition of Wernicke's aphasia; and, more mundanely, when we hear a foreign language we do not understand. We know that language is going on, but we have no way of converting it, via a lexical layer, into a clear knowledge of who is doing what to whom.

The structure of any model affects the mental analogy it creates. Many models use a box-and-line structure, implying separate structures linked by a communication function. The implication of these models is that the boxes do not interact except via the lines: around the boxes are solid walls, and between them is a void. The choice of a block diagram for the component grammar model was deliberate, to create the impression of two vectors at work, moving vertically from thought to expression (or vice versa for the Receiver), and horizontally from meaningful nonlinguistic utterances to meaningless linguistic constructs. However, the lines on the diagram should be seen as fuzzy, even those between the grammars and lexis.

Two examples can be used to demonstrate this fuzziness. The first is the power of collocation in language: words can take on meanings from the context they are in, from the words they are collocated with, and from the grammatical structures they occupy. For instance, the word *dead* has a particular meaning when said in a disco: *it's dead, let's go*. The same utterance said after a dog has been hit by a car has another meaning and other metamessages – context has altered the lexical value. *Dead* has different meanings when collocated with *tired* and *battery* – lexical collocation has altered the semantic value. And *dead* as an adverb, as in *dead on six o'clock*, has a different meaning to *dead* as an adjective, as in *dead at six o'clock*. The meaning of a word is dictated by context, which is arguably the area of simple grammar; by collocation, arguably the area of lexis; and by lexical grammar.

The second example is the definition of what constitutes a word, or a lexeme. A lexeme can consist of a group of words together (idioms): *well, I'd go to the foot of our stairs* is an expression of surprise. It has nothing to do with stairs, physical movement, nor even future intention. It has no greater meaning than *oh!*, which is a subvocalisation and not usually considered a lexeme at all. The content is lexical, but the message is pure simple grammar. At the other end of the scale from idioms there are morphemes: parts of words that carry lexical value but which act like lexical grammar inflections. The *un-* of *unproductive* negates the meaning of the source word, and can be replaced by the full word *not*. But English rules tell us that *not clement* is *inclement*, not *unclement*. Are morphemes a product of lexis or lexical grammar? Pinker's box-and-line approach requires a separate box for morphology<sup>69</sup>, but a fuzzy approach would see it as able to borrow from both lexical grammar and lexis without requiring a separate existence.

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<sup>69</sup> Steven Pinker, *Words and Rules*, p23.

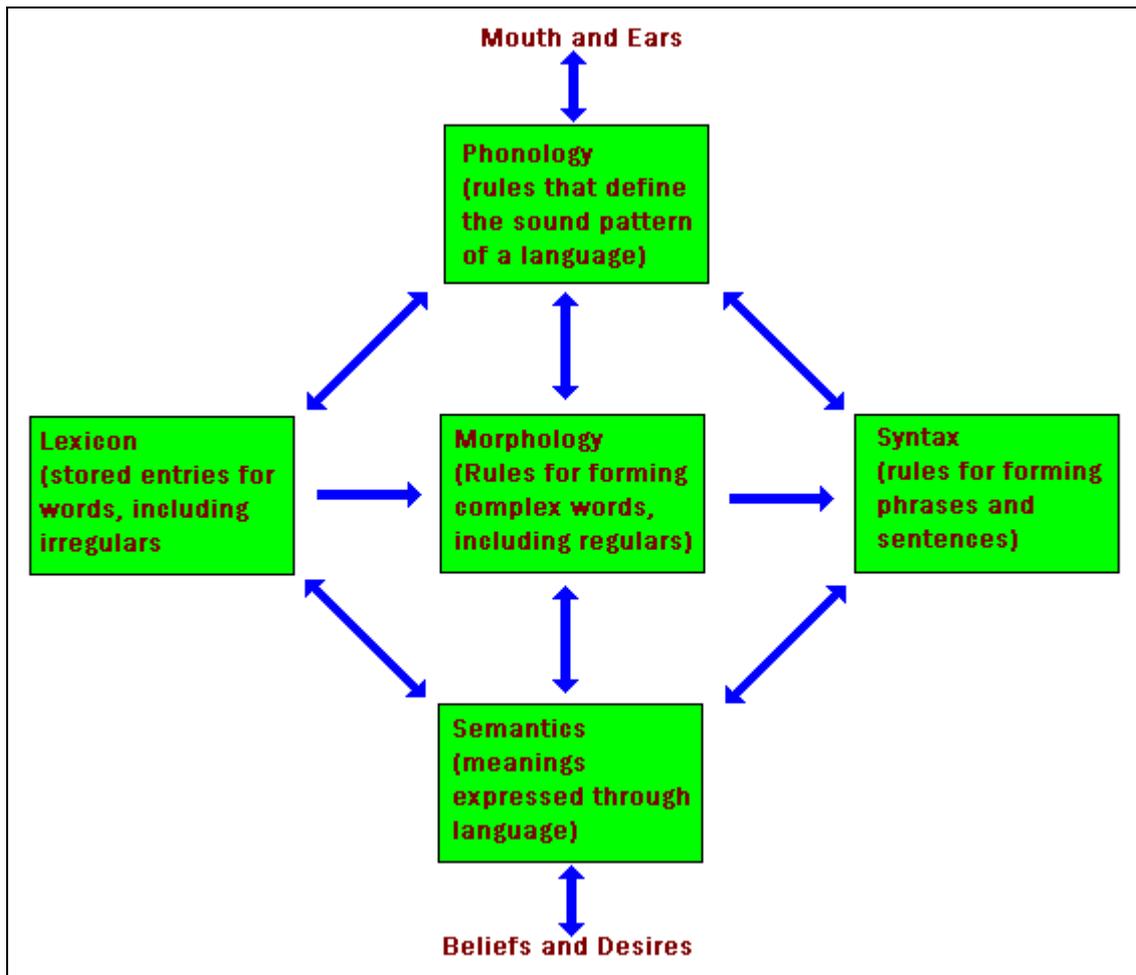


Diagram 17 - Pinker's Model of the Anatomy of Language

## 6.5. Component Grammar in the Mind

Any theory of language has to have a firm grounding in theory of mind. This grounding can take the form of a physical explanation, as expressed by Pinker, in which studies of the physical brain play a large part<sup>70</sup>; or it can be metaphysical, as expressed by Wilson<sup>71</sup>; or it can be behaviour-based, as expressed by Mithen<sup>72</sup>.

While a physical grounding may appear preferable in that it gives solid reality to theory, two things mitigate against this in language. First, language is not a single function in the brain and, although there appear to be common areas important to language in most people's brains, there is no fixed place identifiable where language will always lie. Second, language does not display the characteristics of a modular system developed for a specific purpose; it is amorphous and intimately involved in general

<sup>70</sup> Steven Pinker, *How the Mind Works*, ch3.

<sup>71</sup> Edward O Wilson, *Consilience*, ch6.

<sup>72</sup> Steven Mithen, *The Prehistory of the Mind*, ch7.

mental processes; its functionality lies not in doing a few tasks well, but in enabling a whole range of other tasks. If it is just a mental process for communication then it is heavily overengineered, something that evolution should not allow to happen; as it has happened it is reasonable to assume that what appears overengineered in a single function is probably used in other functions.

The metaphysical theory of mind has both the advantage and disadvantage of a holistic approach. It expresses language as a part of the general structure of the human mind, but it tends to gloss over the special features of language which need to be specified and separated in a linguistic theory. In many ways language exhibits the characteristics of a chaotic system: it is non-linear, being an averaged approximation generated from many human minds; it is ordered but non-periodic, it has rules which are arbitrary in their choice but not in their application; and it is attracted to certain structures, but not to a single structure<sup>73</sup>. This ordered chaos does not fit well in a smoothed holistic model.

The behavioural theory of mind places greatest importance on identified behaviours, and models a theory of mind from these by a process of reverse-engineering. This behavioural approach should not be confused with behaviourism espoused by Pavlov or Skinner; this almost seems to be a theory of non-mind, in that it attempts to explain all behaviour in terms of conditioned response. However, the theories of Skinner do highlight an important problem with the behavioural approach: it creates models, and models are only as good as their initial assumptions and structural description. A model must always be tested against the reality it describes, to identify its limits.

## 6.6. The Component Grammar Survey

From June to August 1999 a survey was conducted to assess the nature of idiosyncratic choice in language, and to aid in the generation of a mental model for component grammar. The question addressed was: Is idiosyncrasy in language just a matter of word choice, or are there differing sets of rules being applied to generate messages? Does idiosyntax exist?

Over all, the survey identified that there is certainly a statistical norm of behaviour, but it also showed several areas where syntactic behaviour is a matter of choice. Most of these non-standard behaviours were individually uncommon, but non-standard behaviour also proved to be quite widespread in total. The behaviours were not limited to a few individuals, instead many people showed a standard response to most questions but a personal response to one or two. The most widespread idiosyncrasies were present in section 2 of the survey, which allowed an open-ended response strategy. So, for reasons of space, only sections 1 and 2 will be considered here.

The purpose of section one of the survey was to give some demographic bases for analysis of the data.

The classic breakdown by age and sex was allowed for, and an attempt was made to identify any effects caused by inexperience in English. Only eight L2 English speakers answered the survey, however, and this did not provide a statistically significant sample. A general measure of educational experience was also included.

The second section was intended to identify vectors of meaning and grammatical form, and was worded as follows:

<i>Please give the opposite meaning (if any) of the following:</i>	
1. The old black bull	_____
2. Hoping for a new dream	_____
3. The Northern lights	_____
4. Above and beyond all duty	_____
5. Moving in ever-decreasing circles	_____
6. The great white hope	_____
7. Once upon a time	_____
8. Total direct communication	_____
9. The love of his life	_____
10. Quietly at home with the children	_____

Diagram 18 – Survey Section 2 Questions

The phrases chosen were a mixture of common idioms, less common idioms and non-idiomatic constructs. The most common idiom is *once upon a time*, while the most unidiomatic are *total direct communication* and *quietly at home with the children*. The phrases are also a mixture of abstractions and concretions, and a selection of different grammatical forms. 1, 3, 6, 8 and 9 are noun phrases and the rest adverbials; 3, 5, 6, 7 and 9 are idiomatic, 1 and 4 could be considered semi-idiomatic, while 2, 8 and 10 are relatively novel constructs. The question was deliberately phrased to allow interpretation. *Opposite meaning* would seem to be a simple concept, thus respondents would be encouraged to consider the phrases to be reversed rather than the process of reversal.

Ideally this survey needed to be carried out on a demographically selected sample of about 500 people, to ensure that all the sample groups identified by section one would be sufficiently filled. In the circumstances it was decided to try for 100 responses, but to analyse whatever had been provided by 31<sup>st</sup> August 1999. This analysis is therefore based on a total of 102 responses only. This is sufficient to provide a three-way cohort split of 95% accuracy, and a four-way split of 90% accuracy. As much of the analysis involves simple comparisons this accuracy is sufficient.

The collected data came from several sources. Responses were sought from friends, both face-to-face and

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<sup>73</sup> James Gleick, *Chaos*, ch11.

via email (about 20), from work colleagues (about 10), from work colleagues of friends (about 10), and from members of a community choir (about 10). In addition, notices inviting participation were placed on several bulletin boards on the Internet, getting about 50 responses. This last provided a surprisingly homogenous sample of mainly middle-aged and educated respondents, although the gender distribution was even. While the work-colleagues, friends and community choir members were not involved in education or linguistic studies, messages accompanying the internet responses indicated that up to 25 of the respondents were directly involved in language or education professionally.

The educational levels of the respondents were analysed somewhat arbitrarily into three groups: Up to 16 (In British terms, up to and including O levels), up to 18 (In British terms, up to and including A levels) and graduate level. The results showed a very strong bias in the sample towards higher levels of education, but further analyses showed no significant response differences based on education level.

Educational Level	Number
Up to 16	7
Up to 18	16
Over 18	76
Unknown	3

Diagram 19 – Education levels of respondents

Age was divided into five ranges of 15 years each. However, no attempt was made to canvas the lowest range, and no responses were received in the highest range. The responses were therefore concentrated into three bands from 16 to 60.

Age	Male	Female	Other	Notes
0 – 15	0	0	0	Age range not canvassed
16 - 30	11	13	0	
31 - 45	31	23	1	
46 - 60	10	11	0	
61 +	0	0	0	No responses were received in this range
??	0	2	0	

Diagram 20 – Respondents by age and gender

In analysing this survey a check was made for large variations in response based on age, gender or education. None were identified, so the sample has been treated as mainly homogenous.

The data received for section 2 appeared to be of two types: constructs where the words were replaced individually in the phrase; and constructs where the whole phrase was replaced. These two behaviours have been labelled **Word Replacement (WR)** and **Phrase Replacement (PR)**. Some of the phrases used in PR have even changed grammatical form (e.g. the noun phrase *the love of his life* became a main clause

in *she hates it*). The identification of the two behaviours raised two related issues:

Were certain questions in the survey predisposed to produce WR or PR constructs?

Were certain individuals predisposed to produce WR or PR answers?

It turned out that questions 1 and 3 (*the old black bull* and *the Northern lights*) produced strong biases to WR behaviour, while questions 4 and 7 (*above and beyond all duty* and *once upon a time*) produced strong biases to PR behaviour. Questions 2 and 6 (*hoping for a new dream* and *the great white hope*) produced weak biases to WR behaviour, and question 9 (*the love of his life*) produced a weak bias to PR behaviour.

In order to judge the behaviour used, the following rules were applied:

Word replacement is judged to have taken place where:

- At least two words have been replaced by terms sharing the same grammatical function, or are unchanged.
- The response consists of at least two words.
- The grammatical function of the whole phrase has not been affected.

Phrase replacement is judged to have taken place in all other circumstances.

For instance, *the Southern Cross* as a reversal of *the Northern lights* would be classed a phrase replacement: while *Southern* is a word reversal of *Northern*, *Cross* is not a reversal (or non-reversal) of *lights*; in addition, *the Southern Cross* is an identifiable celestial phenomenon, a single sememe. Of course, this still leaves some constructs where the choice of PR or WR behaviour is somewhat of a value judgement, and several of these occur in the question 5 responses.

Next, the responses were analysed to see if individuals showed preference for one behaviour or the other. For the purpose of this analysis, one behaviour was deemed to be dominant if the respondent made at least 4 more responses on one side over the other, e.g. if a respondent answered 9 questions, 2 with WR and 7 with PR then PR is considered to be the dominant behaviour. The people who dominate on one behaviour or another have been labelled **Word Replacers (WRs)** and **Phrase Replacers (PRs)**, while people who adopt both behaviours have been labelled **Mixed Replacers (MRs)**.

To test the significance of respondent preferential behaviour a series of hypotheses were checked against the data. The first hypothesis was that people who had made no response to question 1 (referred to as the Red group and predicted to be PRs) would respond to question 7; and those who had made no response to question 7 (referred to as the Green group and predicted to be WRs) would respond to question 1. The Red and Green groups consisted of 12 people each, and it was found that the accuracy of the prediction was 100%; however, the probability of this happening by chance is about 50%, so it indicated only that further tests should be made. In addition, only 6 of the Red group were PRs according to the behaviour rules given above, and only 7 of the Green group were WRs. One Green group member actually turned

out to be a PR.

The Red and Green groups were assessed to see which other questions they did not answer, and to see whether a pattern emerged. It was found that the Green group left fewer questions unanswered over all, with questions 3 and 6 getting the lowest responses from the Red group. This may indicate that a PR strategy gives less flexibility to respond to all questions than WR.

One prediction made regarding WRs and PRs was that PRs would be likely to see question 6 (*the great white hope*) as a single sememe and consider the phrase to have possible racist metamessages. In answering question 6 the Red group adopted three strategies:

refused to answer the question at all (8 (67%) did this);

refused to reverse the white into black (3 (25%) did this);

used the name of a black hero (1 (8%) did this).

A fourth strategy, of directly declaring the question racist, was use by one PR respondent outside the Red group.

The following table shows the response rates for the two groups to all the questions, compared to the overall survey responses.

Question	Red grp responses	Green grp responses	Response difference	Type of Question	PR/WR/Null responses on full survey
1	0% (0)	100% (12)	100%	WR	2 / 86 / 14
2	67% (8)	92% (11)	25%	Weak WR	27 / 62 / 13
3	25% (3)	67% (8)	42%	WR	18 / 53 / 31
4	75% (9)	75% (9)	0%	PR	69 / 16 / 17
5	83% (10)	83% (10)	0%	Mixed	47 / 43 / 12
6	33% (4)	75% (9)	42%	Weak WR	23 / 44 / 35
7	100% (12)	0% (0)	100%	PR	81 / 7 / 14
8	75% (9)	83% (10)	8%	Mixed	41 / 46 / 15
9	75% (9)	83% (10)	8%	Weak PR	56 / 35 / 11
10	75% (9)	92% (11)	17%	Mixed	48 / 43 / 11
Average	61%	75%	14%	45 / 55	412 / 435 / 173
Percents					41 / 44 / 15

Diagram 21 – Red and green group responses

On analysing the actual responses given, there seemed to be a possible pragmatic difference between WR and PR behaviours: WRs seem willing to offer a grammatically or lexically unusual answer (e.g. *partial indirect incommunication*); there were no linguistically odd phrase replacements in the survey.

When the PR and WR behaviours were analysed in relation to gender and age, very slight biases were

detectable. Women seem more likely to phrase replace than men, men more likely to word replace than women; and older people tend to phrase replace, younger to word replace. However, these tendencies are very slight, and the numbers in the survey are not sufficient to prove this bias statistically. A table of the demographic behaviours is below (two non-responders have been treated as mixed responders).

Category	PRs	WRs	MRs	Total
Female	14 (54%)	10 (38%)	25 (50%)	49 (48%)
Male	11 (42%)	16 (62%)	25 (50%)	52 (51%)
Unknown	1 (4%)	0	0	1 (1%)
Total	26	26	50	102 (100%)
Age to 30	4 (15%)	6 (23%)	14(28%)	24 (23%)
Age to 45	13 (50%)	15 (58%)	27 (54%)	55 (54%)
Age to 60	9 (35%)	5 (19%)	7 (14%)	21 (21%)
Unknown	0	0	2 (4%)	2 (2%)
Total	26	26	50	102 (100%)

Diagram 22 – Demographic breakdown of PR and WR behaviours

It does appear from this survey that there is a preference in some individuals for phrase replacement or word replacement. In addition, it appears that the behaviours are idiosyncratic and not necessarily context-based.

As well as identifying phrase and word replacement strategies, section 2 was designed to identify the parts of each phrase which were chosen for opposition. For instance *the great white hope* could be rendered as *a small black despair*, but it seemed likely that only parts of the phrase would be reversed. The choices made should indicate to what degree the words were seen as thematic components, and a prediction was made that non-thematic components would not be reversed.

Throughout the responses few articles were reversed, and these are listed below:

The old black bull	⇒	Many young white cows
	⇒	Any young white cow
	⇒	A young white cow (x2)
The Northern lights	⇒	A Southern dark
The great white hope	⇒	An unimportant black despair
The love of his life	⇒	A fling
	⇒	Just a one-night stand
	⇒	A one-night stand
	⇒	A hate of her death
Once upon a time	⇒	All the time

Of these, five came from one person. It seems to be quite uncommon for the aspects of an article (definite versus indefinite, singular versus plural) to be seen as vectors. Because of this the main analysis ignored articles.

As well as the word replacement and phrase replacement strategies discussed above, there were occasional partial phrase replacements, as in *old bull* becoming *heifer*. However, these were not common.

A detailed analysis of two of the phrases follows. *The old black bull* and *once upon a time* have been used as they are the archetypical phrase replacement and word replacement constructs; but all of the phrases produced interesting responses.

### The old black bull

Excluding people who did not attempt this section, there were 12 null responses out of 100.

All but two who attempted this analysed it word-by-word. There were two whole phrase replacements: *Calf* and *Spring chicken*.

There were 18 different types of response, and one (*young white cow*) was chosen by a majority (55). This indicates a high level of agreement on the meaning and reversal of this construct, much higher than in any of the others.

The vectors used in the answers are as follows:

Old	⇒	Young	76
	⇒	New	4
	⇒	Heifer	2
	⇒	Spring	1
	⇒	Calf	1
	⇒	<i>Unreplaced</i>	1
	⇒	<i>Ignored</i>	1
Black	⇒	White	81
	⇒	<i>Unreplaced</i>	4
	⇒	<i>Ignored</i>	1
Bull	⇒	Cow	60
	⇒	Cows	1
	⇒	Calf	6
	⇒	Heifer	11
	⇒	Pig	1
	⇒	<i>Unreplaced</i>	7
	⇒	<i>Ignored</i>	0
Old+Bull	⇒	Calf	1
Old+Bull	⇒	Heifer	2

*Old to new* is an uncommon but valid vector, and may imply the bull is seen as a commodity and not a live animal. However, it can also be seen as a vector of *established* versus *newcomer*, with no implication of age at all. *Old to spring* is also uncommon: it has a seasonal aspect associated with animals used for meat. One of the phrase replacements also uses the word *Spring*.

*White* is the only vector associated with *black*, and was chosen by most respondents. The low number of non-reversals (5) indicates that this was non-controversial. (Unlike *the great white hope*).

*Bull* appears to have four vectors: gender (*cow, heifer*), age (*calf, heifer*), plurality (*cows*) and species (*pig*). Of these, the gender vector is by far the strongest. The relative weakness of the age vector may be caused by the fact that it has already been covered in *old/young*. The reassignment of animal nature was uncommon, occurring in only one case (*pig*); and only one person reversed the singular to a plural, indicating that these are unusual (although valid) choices.

In terms of what was not reversed, *old* was unreversed in only one case (*old white bull*), and ignored in one case (*white cow*). For *black*, there were four cases of non-reversal, and it was ignored once. *Bull* remained unreversed in 7 cases and, as it is the only noun, there were no cases of it being ignored. The high level of replacement indicates that all three terms were perceived as thematic in the construct.

Grammatically, the original construct is a noun phrase, and in every case a noun phrase was used to replace it.

### Once upon a time

There were 12 null responses, excluding the two who did not attempt this section.

Only 7 people used word replacement here, while 81 used whole phrase replacement. This phrase is obviously treated as a single sememe and, possibly, a single lexeme. 48 different constructs were used to reverse this phrase, and the most selected construct (*the end*) achieved 15 “votes”.

While 7 people is not statistically significant, the vectors have nonetheless been analysed. They are as follows:

Once	⇒	Sometime	3
	⇒	Someday	1
	⇒	Several times	1
	⇒	Many times	1
	⇒	Often	1
	⇒	<i>Unreplaced</i>	0
	⇒	<i>Ignored</i>	0
Upon	⇒	In	5

	⇒	Off	1
	⇒	<i>Unreplaced</i>	0
	⇒	<i>Ignored</i>	1
A time	⇒	The future	4
	⇒	The near future	1
	⇒	Every day	1
	⇒	?	1
	⇒	<i>Unreplaced</i>	0
	⇒	<i>Ignored</i>	0

The reversals of *once* show two vectors: identified versus unidentified (*sometime, someday*); and one versus many (*several times, many times, Often*). *Upon* also has two vectors: outside versus inside (*in*); and on versus *off*. It is interesting to note that, in context, *upon* means *at*, but this vector is not explored. This tends to indicate that the word replacement in these 7 cases was strong enough to overcome even the semantic significance of the phrase.

The reversals of *a time* show two vectors: past versus present (*every day*), and past versus *future*. A post-survey interview with the question-mark respondent indicated that he was trying to give a vector of certainty versus uncertainty, but he was not able to achieve the exact effect he wanted linguistically.

In the 81 phrase replacements a range of strategies are used. The first identifies the story-telling context and reverses the start of the story with the end (*and they all lived happily ever after, at the end, for ever and ever amen, happily ever after, happy ever after, the end, when all was said and done [26]*). The second strategy identifies that the event is in the past and reverses it with the present (*always the present, at present, currently, here and now, in this World today, nowadays, now, presently [16]*), or future (*in the future, in time to come, looking into the future, the future, tomorrow [9]*). The third strategy was to reverse the suspension of belief implied (*it never happened like this, never, never ever, never in a million years, there was never [13]*). The fourth strategy identifies the singularity of the event and reverses it with multiple events (*all the time, constantly, often, time and time again [4]*). The fifth strategy identifies the mythic aspect of the phrase and reverses it with the commonplace (*an everyday common occurrence, as usual, next Thursday, three pm yesterday afternoon [4]*). A sixth strategy identifies the fictional aspect and uses a factual reversal (*biographical experience, I'll tell you something which really happened, in fact, it really happened, see this?, tale with no beginning or end [6]*). A seventh strategy is to identify the fairytale nature and replace it with a darker fictional genre (*it was a dark and stormy night, last night in Detroit, nevermore [3]*).

Phrase replacement shows a wide range of reversal strategies when compared to the limited range of word replacement strategies. This may indicate that phrase replacement offers more choice: metaphor gives more range than antonyms.

The grammatical form of the construct is adverbial, although very specific, formal and idiomatic. It is replaced usually by an adverbial, but noun phrases are also common. Full sentences are also used (in one case incomplete). The constructs are given below:

22 noun phrases (*an everyday common occurrence, biographical experience, tale with no beginning or end, the end, the future, three pm yesterday afternoon, tomorrow*);

9 sentences (*and they all lived happily ever after, I'll tell you something which really happened, it never happened like this, it really happened, it was a dark and stormy night, see this?*);

1 incomplete sentence (*there was never*).

This survey revealed a series of strategies in use. Despite almost all of the respondents passing through a common educational experience, their linguistic “toolkits” appear to have many variations. Several conclusions can be drawn from the data:

- In English, themes tend to occur at the start of constructs and are the most reversed. Thematic content reduces from start to end of the construct, and the last part of the construct is usually least replaced. This matches with the prediction for English in Halliday’s Textual Metafunction.
- Vectors often take the form of *most-least-none*, with some people identifying *most-least* as the reversal and others identifying *most-none*.
- Grammatical form is usually retained, but in a few cases it has been subordinated to the needs of meaning.
- Certain grammatical forms (e.g. noun phrases) seem to be less liable to change than others (e.g. prepositional phrases).
- The number and range of vectors used in the responses indicate that there is a high degree of idiosyncrasy in word meaning.
- There is an indication of two approaches in the reversal of the phrases: word replacement and phrase replacement. This implies that the problem is approached simultaneously with more than one linguistic strategy. Individuals seem to have a preference for one or the other strategy, but most seem able to use both.

A model was needed to explain the two replacement behaviours. This would not be a process model but a mapping model of the way the strategies are chosen in the human mind. If it could relate back to the Component Grammar Process model then it would be an advantage, but this should not be a constraining feature on its design. The model also had to allow for both single strategies and a mixed strategy; it had to provide different routes from the same source to different responses; and it had to place the whole behavioural analysis within a linguistic setting. The task of section 2 (reversal) required a construct to be read, thought about and then expressed in writing, and the model should reflect this.

To aid in the model design, some of the survey respondents were interviewed to find why they had made their choices, and whether they were able to relate their choices to various designs of models. A selection of responses is given in Appendix II. Thanks to these responses, and tutorial discussion, the following model emerged as the most acceptable candidate:

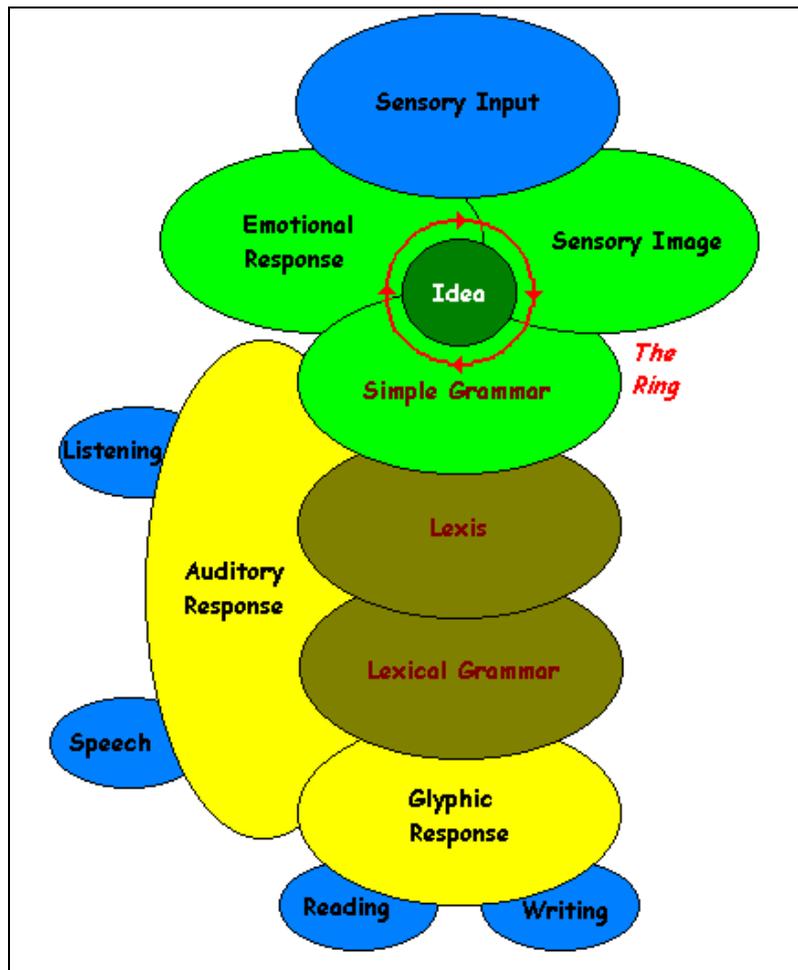


Diagram 23 - The Component Grammar Mental Model

Here we see language being generated from a mixture of emotions, sensory images and simple grammar constructs. The model should be seen as:

- an idea generating images, emotions and grammar elements at the same time;
- a process flow around “the Ring”, until a dominant structure emerges;
- the final construct being passed to the lexical grammar area via lexis for phrasing in language;
- The final construct can be passed for non-linguistic expression directly from simple grammar or lexis, but glyphic expression must pass through lexical grammar.

For some people, or in some instances, the lexical component will dominate. Or sometimes it will be the issue of who is doing what to who (simple grammar). Or it may even be a simple emotional response that needs to be vocalised. The same process works in reverse when moving from apprehension to comprehension. The importance of the emotional aspect of the model was emphasised by one of the interviewees, and fits with the views of Goleman<sup>74</sup> concerning emotion as a function of intelligence.

The thought process used in section two of the survey can be seen as a movement from reading to glyphic

response, through lexical grammar and lexis into “the ring”, eventually going into the black box of general thought (the Idea). Here the construct is reversed in various ways and submitted back to “the Ring”, where the dominant reversal form is chosen and coded. The code then passes back through lexis and lexical grammar to the glyphic response and writing.

However, the following caveats on the model should be stated. First, this is not a model of the mind, nor even a part of it; it is a way of understanding how component grammar may be activated to convert thought into language. It does not address the issue of how thoughts arise, nor does it identify what a thought may be. It is a transformation structure, and nothing else. Second, the lines separating the parts of the model are not fixed but fuzzy. Words have emotional content, and evoke sensory memories. They also contain simple grammar significances: people sit on chairs, chairs do not sit on people. Third, it is not intended to suggest that the modules in the model are real modules in the mind. They are logical divisions intended to describe and not to map the process.

## 6.7. Component Grammar in Communication

The primary purpose of language is communication: it is a device for transferring thoughts from one mind to another. The initial thought need not be a linguistic construct, but it has to be translated into language so that it can be transmitted, received, retranslated and understood.

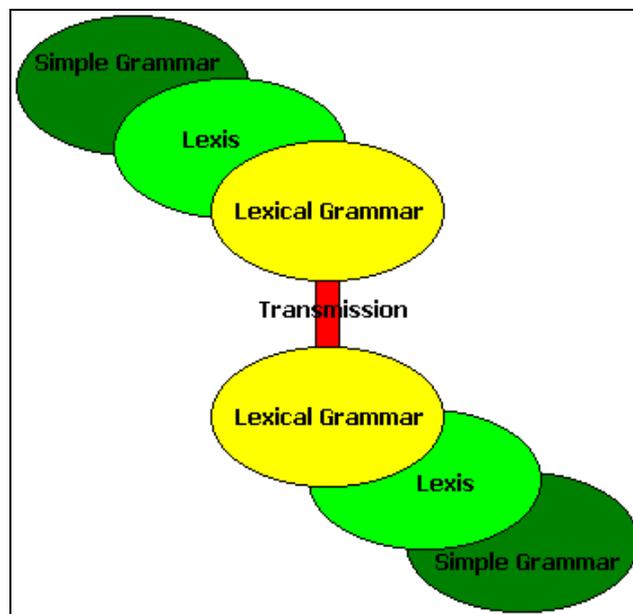


Diagram 24 - Component Grammar Communication model

While language appears to have existence in transmission, it actually has existence only within the minds

of sender and receiver. It would therefore appear intuitive that language must have a similar structure within the two minds in order for successful communication to take place. However, it is a large and uncertain step from similar structure to same structure. In diagram 24 we see the way a message is passed from one component grammar model to another. This shows that there are seven areas where the intent of a message can vary from the understanding of it.

- The wrong simple grammar construct can be chosen. While this seems unlikely, it does occur reasonably frequently. For instance, the addition of a codicil to a message can indicate that the original message contained a misleading or erroneous construct. These codicils are often expressed as alternatives or contradictions: *We'll miss the train; sorry, bus*. But as simple grammar errors are usually viewed through the veil of lexis it is hard to know whether the mistake was of nature or of word.
- The wrong words can be chosen: spoonerisms and malapropisms are the most memorable errors, generated either by subconscious error or conscious non-standard semantic values.
- The wrong lexical grammar can be chosen, such as tense constructs: "the sun shined all day". However, these mistakes are least likely to mangle a message, and usually just give it an odd flavour.
- The transmission channel itself can suffer interference, such as trying to converse in a disco.
- The receiver may have a different lexical grammar. To a speaker of Indian English "I am going to work" can be a continuing series of discrete events, and can be followed by "every day". To a speaker of British English it can only represent a single continuing event.
- The receiver may attach different semantic values to the words used in the message. As words are only socially agreed constructs it is difficult to identify whether the different meaning is because the sender or receiver has the non-standard semantic value.
- The receiver may analyse the message into a simple grammar construct which was not intended by the sender, the traditional area of cognitive dissonance.

With all these possibilities for error, and with different language models operating in sender and receiver, it would seem to be almost chance that successful communication happens at all. However, humans use a variety of tricks in their communication to overcome the problems.

- Redundancy. We repeat, reiterate and overqualify our messages.
- Multichannel communication. In speech we use voice tone, expression, gesture and body movement to supplement our message. Sometimes we can even pass different messages by different channels, such as in the use of irony and sarcasm. Interestingly, in these multichannel messages it is the language channel that usually conveys the least reliable message - in sarcasm the intent is for the words to mean the opposite of their semantic value. Multichannel communication is not easily identifiable in written communication, but conventions of rhetoric can sometimes fill the gap.
- Seeking back-channel communication. Many people nowadays pepper their speech with checking phrases like *OK?*, *y'see?* and *innit?*, which act as indicators to the listener to interrupt if it is not OK, they don't see, or it isn't it. This is unavailable in written communication.

- Props. People are willing to use props - diagrams, text, objects - to support the message.
- Simplification. If a sender detects or anticipates confusion in the receiver then they tend to "dumb down" the language of the message. Common words and simpler lexical grammar will be used, along with a simpler grammar breakdown of the concepts of the message. The concepts are usually then presented singly, often in Instigator / Recipient /Action order. For example: *Remember her friend, Alice? And Arthur, from the butchers? Well, they're cousins.*

These devices serve to ensure that cognition is consonant even where mental models differ. Just as two computers with completely different operating systems can communicate if they are able to negotiate a common protocol, so humans negotiate protocols for successful communication. These protocols are formal structures created by social compact; but, though their presence in language communication may be universal, their form is not. Each communication requires the generation of new protocols.

## 6.8. Working the Component Grammar Model

The component grammar Process model (diagram 16) consists of three layers: simple grammar, lexis and lexical grammar. These layers are individually unremarkable, and are easily identified features of communication. The power of the model comes from the synergistic relationships between these three layers. It is in these synergies that we can actually see the model at work.

The most important features of the model are the two vectors implied in it: the vertical and the horizontal. The vertical vector represents the process of moving from thought to utterance, while the horizontal vector shows increasing sophistication in language usage. These two vectors may have important implications in several areas of Linguistics.

Language is not a fixed thing: society changes and acceptable grammar changes with it. 40 years ago we *tried to do* things; many people today *try and do* things. Today's syntactic permissions are yesterday's forbiddens. But if language is not a fixed thing what does this say about Lexical Grammar? First, it implies there is no such thing as a single Lexical Grammar for any one language. Each person carries around their own version of the grammar of their language. Second, as Lexical Grammar is only produced by the existence of words, the frequency of usage of types of words determines the nature of the Lexical Grammar.

Or, to put it another way, the vocabulary that a person uses determines the grammar they use. This is most notable in poetry, where stylistic features can sometimes identify a poem's author as reliably as a signature. But it can also be seen at work in everyday speech. An important part of the process of speaking is cadence, which allows speech to be continuous and to signal changing relationships in a conversation. But cadence requires a fair amount of phatic addition to the relevant language of the

message. We add speech-phatics for politeness or to establish social roles, although these can well be considered part of the message. But there are other phatics - pause words, fillers, extenders - which seem only to add rhythm to the utterance<sup>75</sup>.

Cadence is so important to us that we do not necessarily pause when we run out of breath, we pause at certain stop points in a sentence. If we attempt a long and complex verbal utterance without sufficient breath we find ourselves wheezing through the final syllables with what breath we have left, rather than taking another breath and continuing more comfortably. The words we use both dictate and are dictated by the cadence of our speech. We will use words that meet the timing needs of what we want to say, or we will add words to maintain cadence. These words can be semi-relevant - an added adjective or adverb; they can be repetitious (*I'm really really tired*); or they can be non-relevant emphatics (the extensive use of swearwords). They all serve the purpose of preventing an utterance from grinding to an unnatural halt. However, both repetition and emphasis also demonstrate the constant devaluation of language in use. Novel phrases seem to have more impact than idioms, so as a phrase becomes common it also mutates in order to retain expressivity.

Another feature of adult human speech is multiple choice. We can select from many different ways of saying something. Almost every word has a synonym, and all words have a "synophrase" - a phrase that performs the same function as the word (dictionaries rely on this). But choice does not end there: some sentences with completely different constructions can mean the same thing. Take the active and passive constructs:

The cat scratched my hand  
My hand was scratched by the cat

But there are other constructs which carry the same message:

The scratches on my hand were done by the cat  
The cat inflicted scratches on my hand

The verb *scratch* has been converted to a noun and a new verb introduced, although the action involved is the same.

In each case we have *the cat* as Instigator, *scratch* as the Action, and *my hand* as the Recipient. Yet Lexical Grammar can express this in at least four ways. In addition the deixis in *my hand* can be replaced by *a hand belonging to me* - same deixis, different construct. And as if this were not enough, we can even use a different construct for the temporal deixis: *has scratched* can replace *scratched*, and *has been scratched* can replace *was scratched*. By combining all these variations we have more ways of blaming a cat than a cat has lives.

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<sup>75</sup> Theo Van Leeuwen, *Speech, Music, Sound*, ch3

These different constructs can be considered to have subtly different emphasis, but this leads us back to personal choice: the decision of how to emphasise a statement affects the lexical grammar used. Emphasis can even be achieved without resort to lexical grammar - in fact the most likely form of the message above is the construct *Damn cat!* while waving the injured limb in the face of the listener.

Of course, the psychological desire to be in the “big party” means that people will always be willing to spend time correcting the assumptions of others. In linguistics the problem starts when people begin to study their own internal lexical grammar and draw unwarranted conclusions about other people's lexical grammars. Thus we have language prescriptions such as not splitting an infinitive, and not beginning a sentence with a conjunction or ending with an adposition. But personal style is something we have to just put up with.

What is considered grammatical or ungrammatical is, for most people, directly related to what they find understandable. For instance, take:

The boy the girl the man helped hit cried

This is much quoted as a grammatically correct English construct, and we can see how it is supposed to work if we rearrange the sentence:

The man helped the girl who hit the boy who cried

But most people dismiss the first sentence as gobbledigook, because it cannot be analysed by their internal lexical grammar. The mind rebels and tells us that noun phrases do not follow noun phrases and verbs do not follow verbs. But that same mind is perfectly at ease with:

The boy the girl hit cried

The internal grammar allows a double iteration but not a triple.

Another example is the pronoun reference. If we say:

John scratched the knife and he was not happy

We know that the pronoun *he* refers to the subject *John*, because *John* is a person. Similarly if we say:

The knife scratched John and he was not happy

we know that the pronoun now refers to the object *John*. In both of these sentences there is nothing in the

grammar to indicate the pronoun reference, it is purely based on our knowledge of the words. But look at:

John scratched Mark and he was not happy

We have no way of knowing who was unhappy. The sentence has two meanings or, to reverse the logic, we have two different messages which are coded into the same combination of words. Of course we can correct these cases where the grammar rules let us down in various ways, but the way we correct the problems are individual, and reveal varying personal grammars.

Dialects are built upon these personal lexical grammars, such as the Cornish expression *how are you so?*, a probing response to an expression of personal malaise. Is *so* an adposition acting as a noun, or is *be so* an intransitive verb phrase? Do the Cornish really care either way?

Aitchison<sup>76</sup> claims that *Keith gave a headache to Helen* is ungrammatical, because we cannot give headaches to people, we can only give people headaches. But when the sentence was offered to 17 people in a straw poll, 11 failed to find anything wrong with the sentence. Are their internal grammars faulty? And, whether they considered the construct correct or not, everyone was able to offer a clear analysis of who was doing what to whom. If we replace *a headache* with the pronoun *it*, then saying *Keith gave it to Helen*, feels more comfortable than saying *Keith gave Helen it*. Is this, perhaps, grammatical hair-splitting? In the end we have to accept that, in this respect, Aitchison's internal grammar is different to some other people.

Is it possible to express component grammar as a text analysis tool? It is endemic to the message, and separation of the elements in language would appear to be difficult. However, Halliday's work on Functional Grammar show that methodologies relating lexemes to meaning are possible. Component grammar owes a lot to functional grammar, but functional grammar takes as its starting point an analysis of the utterance in four ways: the Experiential metafunction, the Interpersonal metafunction, the Textual metafunction and the Logical metafunction. These metafunctions operate virtually independently, and analyse the text in different ways for different purposes. They do not provide a single method to analyse meaning out of the message.

The analysis method that comes out of the constituents of component grammar is monolithic, but it is of very limited use as a text analysis tool. However, the fact that it is possible at all is evidence of the grounding of the theory. The constituents of component grammar are:

- Instigator
- Action
- Recipient
- Deixis (temporal and other)

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<sup>76</sup> Jean Aitchison, *The Articulate Mammal*, p162

➤ Connectivity

The first three of these are recognisable in the functional grammar Experiential metafunction as Instigator, Process and Goal, while Connectivity identifies with the Logical Metafunction. Deixis is less easily identified in Functional Grammar and tends to be ubiquitous. Let us look at a selection of sentences to identify the ways that component grammar works in textual analysis.

**Janet saw John**

This is probably one of the simplest constructions in the language. In traditional terms it divides into Subject/Verb/Object, and the component grammar model is no different:

Janet	saw	John
Instigator(I)	Action (A)	Recipient (R)
<i>Identity(Id)</i>	<i>Temporal Deixis (DT)</i>	<i>Id</i>

*Saw* serves two functions in the analysis, and this will prove to be a common feature in the component grammar model - single units of speech serve multiple functions. Another feature is the identity associated with both Recipient and Instigator. This acknowledges the essential similarity and exchangeability of the Instigator and Recipient. The division of the analysis into two lines follows the identification in 2.3 of the “real” components (Actor, Instigator, Recipient) and the “ephemeral” components (Deixis and Connectivity).

**I shaved today**

Another common form, this illustrates the reflexive in component grammar:

I	shaved	today
I/R	A	
<i>Id</i>	<i>DT</i>	<i>DT</i>

*I* acts as both Instigator and Recipient, but this need not be the case: in *I started today*, the Recipient of the action is exophoric to the construct, so would be identified with the Action. *Today* acts as a temporal limit on the action, giving it an earliest starting point of the beginning of today. *Shaved* gives the action a latest ending time of now, so the action is temporally bound at both start and end.

**The tests were completed without effort**

This is the intransitive form, and shows that the Instigator can be unstated. This does not mean that it does not exist, merely that it is not relevant to the message.

The	tests	were	completed	without	effort
R		A/I	A		
<i>Deixis (D)</i>	<i>Id</i>	<i>DT</i>	<i>DT</i>	<i>D</i>	<i>D</i>

The inclusion of the Instigator in *were* does not mean that *were* is itself the Instigator, but it is a prompt to the listener not to expect an identified Instigator. If later in the utterance the listener encounters the word *by* then it acts to "switch back on" the expectation of an identified Instigator.

The Deictic item *the* defines the tests referenced. It is part of the noun phrase (or Recipient phrase) in this construct. The deixis in *without* and *effort* defines the verb phrase (or Action phrase).

### **I know an old woman who swallowed a horse; she's dead, of course**

This is a complex sentence with two main clauses and a subordinate clause attached to the first main clause. It breaks down as follows:

I	know	an	old	woman	who	swallowed	a	horse;	she	's	dead,	of	course
I	A	R						--					
--									I/R	A			
--		I			A		R		--				
<i>Id</i>	<i>DT</i>	<i>D</i>	<i>D</i>	<i>Id</i>	<i>D</i>	<i>DT</i>	<i>D</i>	<i>Id</i>	<i>DT</i>	<i>DT</i>	<i>D</i>	<i>D</i>	

The subordinate clause (line 3) forms the Recipient of the first main clause. *Of course* acts to give certainty to the Action in the second main clause; it adds deixis of modality. *Who* acts to define *an old woman* as the thing *known*. Without *who*, the clause *I know an old woman swallowed a horse* defines the event *an old woman swallowed a horse* as the thing *known*.

### **I went to the cinema with my brother, Bill**

This sentence has an unusual structure in component grammar, and shows that there can sometimes be unusual results:

I	went	to	the	cinema	with	my	brother,	Bill
I	A		R		I			
<i>Id</i>	<i>DT</i>	<i>D</i>	<i>D</i>	<i>Id</i>	<i>Connective (C)</i>	<i>D</i>	<i>D</i>	<i>Id</i>

The connective function of *with* indicates that the following phrase is associated with either the Instigator or the Recipient. It is part of the problem in English that we cannot discern which it is without prior knowledge of the Action. In this case *Bill* is more likely to go to the cinema with me, rather than be in some way attached to the cinema. But some constructions are unfathomable: *the police are looking for a*

*man with one eye.*

The decision that *my brother* is deictic to *Bill* is arbitrary; it is just as reasonable to consider *Bill* as deictic of *my brother*. It is an example of a common message with different meanings - although in this case the difference is trivial.

### The boy the girl the man helped hit cried

This has already been mentioned as a grammatical sentence with an impenetrable meaning - does component grammar give us a clue as to why this should be?

The	boy	the	girl	the	man	helped	hit	cried	
I/R								A	
R		I					A	--	
--		R		I		A	--		
<i>D</i>	<i>Id</i>	<i>D</i>	<i>Id</i>	<i>D</i>	<i>Id</i>	<i>DT</i>	<i>DT</i>	<i>DT</i>	

The clue to the problem lies in the fact that the boy and the girl are both Instigator and Recipient, and these different roles come out of different levels of the utterance. The mind has to work out eleven relationships to understand - *the boy* is part of the Instigator once and Recipient twice, *the girl* is part of the Instigator twice and Recipient twice, *the man* is part of the Instigator three times and Recipient once. These eleven relationships are too many for short-term memory. Compare this to *the boy the girl hit cried*, which has only four relationships.

### John is eager/easy to please

John	is	eager	to	please
I	A			R

John	is	easy	to	please
I	A	R		

Why should two similar constructs that are so similar be analysed so differently? The answer has to lie in a difference between the words *eager* and *easy*, and it may be found by looking at other related constructs. We can ask *What is John eager to do* but not *\*What is John easy to do*, indicating that there is a grouping in the phrase *easy to please* which is missing from *eager to please*. Similarly if we replace *please* with *to be pleased* we find that the meaning of construct 1 changes, while construct 2 remains much the same (although *John is easy to be pleased* is definitely uncommon usage, which further indicates that *easy to please* is a group that does not like to be broken up). Of course, *John is eager to please* could also be analysed as a stative – John is in the state of eagerness to please – but the word *eager*

has an action element that *easy* lacks. This is best demonstrated by removing *to please* from the constructs: *John is eager* has a similar meaning to the first construct, but *John is easy* means something completely different: *easy* has had to take a new meaning. It therefore seems reasonable to group *easy to please* as a single unit, which places it as the Recipient of the Action. It also seems reasonable to place *eager* as part of the Action, leaving *please* as the Recipient – it is the way in which John's eagerness is manifested. The reason for comparing these two constructs comes from Chomsky: he used these two sentences to illustrate that meaning has no place in grammatical analysis. It therefore seemed necessary to tackle one of the "hard tasks" to illustrate that meaning is integral to a component grammar analysis.

From the above it seems that a set of rules can be generated to govern the process of component grammar analysis:

- Identify the main action, the part of the utterance which changes the state of the world. Ask the question: what is happening here?
- Identify the main Instigator, the part of the utterance which describes the person or thing that is changing the world. This is often obvious in English as the starting point of an utterance, although "bracketted off" structures may occur before it. Ask the question: who or what is the cause, without which the action would not have happened?
- Identify the thing, event or state that is the Recipient. Ask the question: who or what is the action being done to?
- What is left is deixis, connectivity or identity.

However, it is important to reiterate that the analyses produced in this way are only evidence of existence of components. In terms of textual features and linguistic devices the method is sterile.

## 7. Conclusions

### 7.1. What the Component Grammar Model is Not

This paper has attempted to cover a lot of ground, but it has been written within the restraint of a word count. This means that there are several areas which have been cursorily addressed or taken as givens:

- Temporality, tense, aspect, and modality have been largely ignored. These are elements of deixis contained within the English verb form, and they merit a discussion by themselves; the dynamics of the time of the action, the temporal viewpoint adopted by the sender and the actual temporal location of the sender offer an intricate set of relationships. Add to this the continuity of the action, the repetition of the action, and the probability of the action occurring, and there is enough subject matter for a separate dissertation.
- Genetics and memetics as instigators of language have been discussed cursorily, but little depth has been added to the subjects. Darwin, Dawkins, Blackmore et al have already covered this ground in much greater detail.
- How metamessages are generated has not been explored, along with how different mental models can create metmessage dissonance even though the main message is consonant. Metamessages have been discussed only as message carriers, the nature of the messages they carry has not been investigated.
- Traditional grammar, phrase structure grammar, morpheme and idiom analysis have been mentioned in specific cases, but they have largely been taken as givens, already understood by the reader.
- Analogy and metaphor cover a wide area, some would say they are integral to language. While these subjects have been discussed, this paper has only scratched the surface.

The paper has established component grammar in one descriptive form (section 2.3) and three model forms (diagrams 16, 23 and 24), but it is important to stress the limitations in these models. First, the component grammar models are an explanation of how language is generated, used and understood. While the principles of component grammar can be used to analyse texts, they do not provide a very illuminating discourse analysis tool, although they may have some use in structural semantics.

Second, the component grammar models do not address consciousness or thought, except in relation to language. Thought processes are treated as black box procedures which precede and follow the activities of the models, although cognition is of the essence of the models themselves. In this regard the component grammar models are based on a mechanistic allegory.

Third, despite the speculation in section 6.3, the component grammar models do not offer an explanation of the anthropological sources of language. While it is possible to very broadly map the levels of the model onto a possible anthropological development path, the correspondence remains unproven. The proof or disproof of this falls outside the ambit of this paper.

Finally, the component grammar model does not map directly onto physical structures within the brain. It is a theory of mind, an analogy of assumed mental processes. The modules described in the models are devices to explain the models, and are not intended to imply the existence of similar discrete modules in the mind.

## 7.2. What the Component Grammar Model Shows

This paper has attempted to establish the following:

- There are basic components to grammar, namely Action, Instigator, Recipient, Deixis and Connectivity.
- These grammatical components can be identified in many forms of communication, including that of nonhuman non-linguistic beings. The expression of these components in signals does not need to be cognitively inspired, it can be hormonally or genetically inspired.
- Language is a special form of communication, involving the manipulation of symbols. Symbols are socially agreed representations with very limited relation to the things they represent. As only humans appear to use symbols it seems likely that only humans have language.
- Language traditionally consists of lexis and grammar: symbols, and the rules to combine them into messages. But the components of grammar are also detectable without symbols, and in combined forms as well as simple identities. There seem to be two levels of grammar at work.
- The two levels of grammar seem to divide into one that precedes lexis and can operate without it (simple grammar); and one that can only operate through lexis (lexical grammar). Lexis seems to sit between the two types of grammar.
- While grammar consists of rules and lexis consists of symbols, the power of lexis is such that it carries rules within it. The division between lexis and grammar is therefore fuzzy, and this applies to both the lexis-lexical grammar interface and the lexis-simple grammar interface.
- Language can therefore be described as a series of overlapping and merging functions, in contrast to

the traditional models of modules separated in effect and linked only tenuously. This new structure fits more closely with the apparent neural network mechanisms of the brain than do modular structures, but it is not to be considered a model of the brain.

These ideas individually are not revolutionary. The division of grammar into two forms was identified by Chomsky, although his division of form was quantitatively different to the division given here<sup>77</sup>. The fuzziness of lexis and grammar was recognised by Derrida<sup>78</sup>, and the ubiquity of metaphor was discussed by Ricoeur<sup>79</sup>. The direction of this paper has been to identify ways in which existing ideas can be brought together and synthesised into a new set of relationships. It is hoped that these new relationships may prove a fertile ground for the creation of new views on language.

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<sup>77</sup> Noam Chomsky, Language and Problems of Knowledge, lecture 2.

<sup>78</sup> Jacques Derrida, Of Grammatology, Part I, ch2.

<sup>79</sup> Paul Ricoeur, The Rule of Metaphor, study 3.

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## Glossary of Terms

<b>Action</b>	The process in the <i>message</i> by which the <i>Instigator</i> is related to the <i>Recipient</i> . The activity indicated in the message.
<b>Actor</b>	See <i>Instigator</i> .
<b>Addressee</b>	See <i>Receiver</i> .
<b>Addresser</b>	See <i>Sender</i> .
<b>Adjective</b>	A <i>traditional grammar</i> word form. A word which gives <i>deixis</i> to <i>nouns</i> .
<b>Adposition</b>	A <i>traditional grammar</i> word form. A word which indicates a relationship between two <i>Identities</i> , or which combines the attributes of two <i>Identities</i> to name a third <i>Identity</i> . Can also act between two <i>Actions</i> , or between an <i>Action</i> and an <i>Identity</i> .
<b>Adverb</b>	A <i>traditional grammar</i> word form, or rather a group of word forms. In their two main roles adverbs give <i>deixis</i> to <i>verbs</i> and to <i>adjectives</i> .
<b>Agent</b>	See <i>Instigator</i> .
<b>Agent-plus-action</b>	Bickerton's name for the structure identifiable in nonhuman signals, roughly equating to the <i>subject</i> and <i>predicate</i> of a <i>sentence</i> construct in <i>language</i> .
<b>Algorithm</b>	A set of instructions or actions designed to convert one state of existence into another, e.g. a recipe.
<b>Amislan</b>	American Sign Language, one of the many sign languages used by the hearing impaired.
<b>Analog</b>	A device or process that measures or changes on an infinitely variable scale.
<b>Analogy</b>	The human ability to extrapolate from one situation or object to another, based upon perceived similarities. See also <i>metaphor</i> .
<b>Anaphor</b>	A <i>pronoun</i> referencing a previously defined <i>noun</i> ; a short <i>lexeme</i> which acts as a summary of a more complex <i>sememe</i> .
<b>Bardic Tradition</b>	A tradition in early societies where wisdom and stories were passed on orally, using song and poetry to aid memory.
<b>Behaviour, Macchiavellian</b>	A theory proposed by Byrne and Whiten, that primates use knowledge of the motivations of others to organise their societies.
<b>Behaviourism</b>	The approach to language acquisition espoused by B.F. Skinner, which proposed that all language is learned by example and repetition. Largely discredited by Chomsky and Piaget.
<b>Bipedalism</b>	The ability to use only two limbs for mobility, freeing the other limbs for other purposes. Seen as a prerequisite for tool use, which some believe to be the source of <i>symbol</i> usage.
<b>BSL</b>	British Sign Language. See also <i>Amislan</i> .
<b>Cadence</b>	A regular rhythm detectable in speech. Possibly used to govern the language constructs used, and therefore possibly a feature of grammar.
<b>Cataphor</b>	A <i>pronoun</i> referencing a <i>noun</i> not yet made explicit; a short <i>lexeme</i> which acts as a summary of a more complex but undefined <i>sememe</i> .
<b>Class</b>	Objects grouped together and considered to form a separately identifiable type, e.g. leaves, flowers, people. Most classes are universally accepted by humans, but they nonetheless represent an arbitrary grouping.
<b>Context</b>	The environment in which an utterance or <i>signal</i> is made. Context has an important effect on meaning.
<b>Code</b>	The rules by which <i>meaning</i> is coded into a <i>message</i> .
<b>Cognitive Consonance</b>	When the <i>message</i> understood by the <i>Receiver</i> matches the intentions of the <i>Sender</i> .
<b>Cognitive Dissonance</b>	When the message generated by the <i>Sender</i> is not the <i>message</i> understood by the <i>Receiver</i> . It can be caused by faults in the message or in the <i>signalling</i> process, or by differences of cognition between the <i>Sender</i> and <i>Receiver</i> .
<b>Cognitivism</b>	The approach to language acquisition espoused by Piaget, which proposed that language is learned as a set of examples extrapolated into rules.

<b>Communication</b>	The process of passing a <i>message</i> between a <i>sender</i> and a <i>receiver</i> by the use of a <i>signal</i> . Both sender and receiver are integral to this definition.
<b>Communication, Back-channel</b>	The process whereby the <i>Receiver</i> passes confirmatory messages back to the <i>Sender</i> . Not fully messages themselves, they act in a <i>phatic function</i> to enable the message channel.
<b>Communication, Multichannel</b>	<i>Communication</i> using several methods at once: e.g. a verbal component and a gesturing component. Most speech is actually multichannel.
<b>Concept Tree</b>	A model used to show how concepts link to related concepts, and often back to themselves. It is a process model and not a physical structure model.
<b>Conjunction</b>	A <i>traditional grammar</i> word form. A word that links <i>lexemes</i> or <i>sentences</i> of equivalent form. An important feature in the iterative process of language, as well as in the logical connection of ideas.
<b>Connectivity</b>	The process in language whereby events and ideas can be related. Connection can occur as a grouping function (e.g. between <i>identities</i> ), as a logical relationship or as a temporal relationship.
<b>Connotation</b>	The <i>meanings</i> in a <i>message</i> which are not explicit. Connotation can be intended or unintended.
<b>Deixis</b>	Differentiation between objects by identifying physical features, or placement in space or time. A major function of language, in the creation of identities.
<b>Deixis, Contextual</b>	Differentiation between objects by identifying physical features.
<b>Deixis, Spatial</b>	Differentiation between objects by identifying placement in space.
<b>Deixis, Temporal</b>	Differentiation between objects by identifying placement in time.
<b>Denotation</b>	The intended <i>meaning</i> in a <i>message</i> . Denotation must be intended, but it does not need to be understood as intended, and the intention can be genetic or hormonal.
<b>Determiner</b>	A <i>traditional grammar</i> word form. A word that identifies the nature of a <i>noun</i> or noun phrase as definite or indefinite, close or far, intimate or formal, etc.
<b>Dexterity</b>	The ability to use the limbs (especially the hands) to manipulate tools.
<b>Digital</b>	A device or process that measures or changes on a scale with discrete intervals. The most known digital process is binary, where only two states (on or off) are recognised.
<b>DNA</b>	Deoxyribose Nucleic Acid. The chemical structure on which our genetic make-up is based. DNA is often used as a shorthand description of the whole genetic process.
<b>Discourse</b>	The name for a series of exchanged messages; the communication process between individuals; a cultural communication environment; a conversation.
<b>E-Language</b>	External Language. Chomsky's term for the language discovered from utterances; see also <i>I-language</i> .
<b>Empiricism</b>	The most common approach to language acquisition nowadays, which attempts to study and describe language learning processes as they are. An attempt to remove preconception from language study.
<b>Eusociality</b>	The level of socialisation demonstrated by wasps, bees, ants and termites. Characterised by specialised classes of individuals, an unchanging social structure, and limited individual fertility. Communication ceases to be a matter of individual emphasis and becomes goal oriented.
<b>Evolution</b>	The changes in the <i>DNA</i> of a species which lead to changes in physical structure. This is continuous and random, but only changes that lead to greater fitness for survival tend to be propagated onward.
<b>Evolution, Darwinian</b>	Changes in the physical structure of a species caused by changes in the environment, and which make the species better able to survive in the new environment.
<b>Exophor</b>	A reference to a concept which is not defined within the utterance, text or discourse. To a certain extent, the importance of <i>symbols</i> means that every use of language can be considered exophoric.

<b>Expressivity</b>	A function of speech. The addition to an utterance of tone, volume, pitch or other phonetic features which serve to add <i>metamessages</i> to the main <i>message</i> .
<b>Function, Aesthetic</b>	The relation of a <i>message</i> to itself. See diagram 3, the Jakobson Function model.
<b>Function, Connative</b>	The actual information the <i>Receiver</i> gains from the <i>message</i> . See diagram 3, the Jakobson Function model.
<b>Function, Emotive</b>	The attitudes the <i>Sender</i> adds to the <i>message</i> about the <i>Referent</i> . See diagram 3, the Jakobson Function model.
<b>Function, Injunctive</b>	See <i>function, connative</i> .
<b>Function, Metalinguistic</b>	The signs and symbols used by the <i>Sender</i> to encode the <i>message</i> . See diagram 3, the Jakobson Function model.
<b>Function, Phatic</b>	The methods used by the <i>Sender</i> to engage the attention of the <i>Receiver</i> . See diagram 3, the Jakobson Function model.
<b>Function, Poetic</b>	See <i>function, aesthetic</i> .
<b>Function, Referential</b>	The information contained in the <i>message</i> about the <i>Referent</i> . See diagram 3, the Jakobson Function model.
<b>Gene</b>	A strand of <i>DNA</i> which produces a particular effect upon an organism. A gene is not definable by size or content, only by effect.
<b>Generalisation</b>	The process of making a general rule from a series of specific instances.
<b>Genetics</b>	The science of analysing <i>gene</i> function within <i>DNA</i> . More recently, the process of amending <i>DNA</i> artificially.
<b>Gestalt</b>	An <i>identity</i> produced by extrapolation from the features of other identities. E.g. the concept “apple” is a gestalt of individual apples.
<b>Grammar</b>	A set of rules which can be used to analyse a language message.
<b>Grammar, Component</b>	The relationship in messages between <i>Action</i> , <i>Instigator</i> and <i>Recipient</i> , allowing for expression of <i>deixis</i> and <i>connectivity</i> .
<b>Grammar, Deep</b>	See <i>Structure, Deep</i> .
<b>Grammar, Descriptive</b>	An analysis of how <i>language</i> actually works. However, this has been mitigated by the idea that languages exist as entities, and the rules of these entities must therefore be discoverable. The identification of statistical rules often leads to a prescription based on majority usage.
<b>Grammar, Functional</b>	The <i>grammar</i> identified by Michael Halliday. It places <i>meaning</i> at the centre of <i>language</i> and constructs a grammar to analyse that meaning.
<b>Grammar, Generative</b>	In Chomsky’s model, the <i>grammar</i> which determines the <i>deep structure</i> of language. The <i>universal grammar</i> of all languages.
<b>Grammar, Lexical</b>	In the <i>component grammar</i> model, the grammar which is determined by the nature of words themselves.
<b>Grammar, Mental</b>	From Pinker. The hypothetical <i>generative grammar</i> stored unconsciously in a person’s brain.
<b>Grammar, Pedagogical</b>	A book of <i>prescriptive grammar</i> rules.
<b>Grammar, Phrase Structure</b>	A text analysis tool which divides language constructs into phrasal units, further analysing these until individual <i>lexemes</i> are identified. See 5.4.
<b>Grammar, Prescriptive</b>	Based on the idea that <i>language</i> is a social function and not personal, it makes a division between acceptable <i>grammar</i> and non-acceptable. Linguists officially condemn this approach, but it is used every time an English paper is marked.
<b>Grammar, Reference</b>	A book describing <i>descriptive grammar</i> .
<b>Grammar, Simple</b>	In the <i>component grammar</i> model, the <i>grammar</i> which is determined by the content of the <i>message</i> .
<b>Grammar, Standard Theory of</b>	Chomsky’s model of the generation of language in discourse. See diagram 8.
<b>Grammar, Stylistic</b>	See <i>grammar, prescriptive</i> .
<b>Grammar, Surface</b>	See <i>Structure, Surface</i> .
<b>Grammar, Theoretical</b>	A study of the structures behind a <i>descriptive grammar</i> ; the study of the way <i>language</i> works in general terms.
<b>Grammar, Traditional</b>	The attitudes and methods that produce a <i>prescriptive grammar</i> .
<b>Grammar, Transformational</b>	See <i>grammar, standard theory of</i> .

<b>Grammar, Universal</b>	Chomsky's theory that the language faculty has an initial, genetically determined state.
<b>Grooming, Social</b>	The process by which social groups establish roles without resort to violence; a way of building alliances in a Machiavellian environment.
<b>I-Language</b>	Internal Language. Chomsky's term for the language held in the mind of the individual from which they generate <i>E-language</i> .
<b>Icon</b>	A sign which has a one-to-one correspondence with the thing it identifies, e.g. the word London is an icon representing the city.
<b>Identity</b>	In <i>Component Grammar</i> analysis, a word which identifies <i>Instigators</i> and <i>Recipients</i> , usually nouns.
<b>Idiolect</b>	A personal vocabulary.
<b>Idiom</b>	A set of words which form a single <i>lexeme</i> . A idea which is unrelated to the words used to describe it.
<b>Idiosyntax</b>	A personal <i>grammar</i> .
<b>Iff</b>	If and only if. A term from symbolic logic.
<b>Implicature</b>	See <i>Metamessage</i> .
<b>Index</b>	A sign which has a correspondence to a series of items, but which is used only for those items. E.g. the word apple is an index representing the group of apples.
<b>Inference</b>	See <i>Metamessage</i> .
<b>Inflection</b>	A change made to a word to indicate a different context, time or place; e.g. the adding of an "s" to form a plural in English.
<b>Information Transaction</b>	See <i>Discourse</i> .
<b>Instigator</b>	The performer of the <i>Action</i> in a <i>message</i> .
<b>Interpretation, Phonetic</b>	In Chomsky's <i>Standard Theory of Grammar</i> , the final expression of a thought in words.
<b>Interpretation, Semantic</b>	In Chomsky's <i>Standard Theory of Grammar</i> , the final expression of a thought as a <i>message</i> .
<b>Iteration</b>	Repetition with paraphrasing. Repetition of meaning without repeating the message exactly. Repetition of structure with changed meaning.
<b>Knowledge Acquisition</b>	The process of learning and memorising.
<b>Language</b>	The specific messaging code used by humans. It includes the rules whereby meaning is coded into or interpreted from the communication.
<b>Language Acquisition Device (LAD)</b>	Chomsky's name for the inherited human ability to learn a first language.
<b>Lexeme</b>	A unit of <i>meaning</i> ; a word; an independent <i>morpheme</i> ; an <i>idiom</i> . See also <i>sememe</i> .
<b>Lexicon</b>	A written lexis. A dictionary. In Chomsky's <i>Standard Theory of Grammar</i> , the set of <i>lexemes</i> held in a human mind.
<b>Lexis</b>	A vocabulary of a language.
<b>Linguistics</b>	The study of <i>language</i> as a communication phenomenon, as a discrete and identifiable <i>gestalt</i> , or as a structure of rules.
<b>Malapropism</b>	A word used outside of its agreed <i>meaning</i> but within the agreed meaning of a similar-sounding word; e.g. I must water the germanium. From David Sheridan's Mrs Malaprop.
<b>Meaning</b>	The reason for the <i>communication</i> . The intention of the <i>sender</i> and the interpretation of the <i>receiver</i> are both forms of <i>meaning</i> , although in a successful communication they are the same. Intention and interpretation need not be cognitively inspired, they can be genetically or hormonally inspired.
<b>Meme</b>	An idea, instruction or behaviour which is socially transmissible. The competition of ideas with each other creates a model where Darwin's evolutionary struggle can be applied symbolically to the struggle of ideas, and memes can be equated with <i>genes</i> as units of information and effect.
<b>Memory</b>	The ability of brains to record and recall events.

<b>Message</b>	The structure containing both the <i>intended meaning</i> generated by the <i>sender</i> and the <i>interpreted meaning</i> received by the <i>receiver</i> . Both sender and receiver are integral to this definition, and it includes both <i>Component message</i> (as defined in diagram 4) and <i>Metamessages</i> .
<b>Message, Semiotic</b>	The structure of information generated by the <i>Sender</i> and intended for the <i>Receiver</i> .
<b>Message, Jakobson</b>	The information carrier from <i>Addresser</i> to <i>Addressee</i> .
<b>Message, Component</b>	The intended information generated by the <i>Sender</i> to produce an effect on the <i>Receiver</i> . See diagram 4.
<b>Metafunction, Experiential</b>	In Halliday's model, the clause as a representation; construing a model of experience in a segmental way.
<b>Metafunction, Interpersonal</b>	In Halliday's model, the clause as an exchange; enacting social relationships prosodically.
<b>Metafunction, Logical</b>	In Halliday's model, the relationship between clauses; constructing logical relations iteratively.
<b>Metafunction, Textual</b>	In Halliday's model, the clause as a <i>message</i> ; creating relevance in context.
<b>Metamessage</b>	Subtexts which accompany the main meaning of a <i>message</i> . They can be intended or unintended. See diagram 4.
<b>Metaphier</b>	In Jaynes' model, the device used to create the <i>metaphor</i> .
<b>Metaphor</b>	A semantic transference effect, where the meaning of a word allows it to be associated with another identity.
<b>Metaphrand</b>	In Jaynes' model, the effect the <i>metaphor</i> is supposed to create in the listener.
<b>Monkeys, Vervet</b>	A species where the signalling methods and messages have been largely documented.
<b>Morpheme</b>	A word or part of a word which has an identifiable <i>meaning</i> , and which can exist as an individual semantic entity.
<b>Nativism</b>	A generic name given to the theories of Chomsky, that most language structure is innate and not learned.
<b>Nomination</b>	The naming of individuals, places and events; therefore the ability to identify individuals, places and events. See also <i>Icon</i> .
<b>Nonhuman</b>	A generic name for all beings other than humans.
<b>Noun</b>	A <i>traditional grammar</i> word form. A word that identifies a person, place or event. It acts as <i>Subject</i> or <i>Object</i> in a sentence and is usually identified with <i>Instigator</i> or <i>Recipient</i> .
<b>Noun Phrase</b>	A group of words which, when taken together, perform the same function in a <i>sentence</i> as a single <i>noun</i> .
<b>Nuance</b>	A <i>metamessage</i> which was unintended by the <i>Sender</i> .
<b>Object</b>	The part of a <i>sentence</i> that receives the action of the <i>verb</i> .
<b>Object Concept</b>	A mental flag which helps to identify individual <i>identities</i> ; e.g. roundness, sweetness, etc. Not usually an identity itself.
<b>Opposable Thumb</b>	A digit on the hand which can be moved to form a pincer with one or more of the other digits. It allows manipulation of quite small items, and is a prerequisite for effective tool use.
<b>Other Awareness</b>	Awareness that the self is not the only being with intentions and needs. A requirement before a species is able to use Machiavellian social reasoning.
<b>Paraphier</b>	In Jaynes' model, the associated images generated by the <i>metaphier</i> .
<b>Paraphrand</b>	In Jaynes' model, the <i>paraphiers</i> as applied back to the original <i>metaphor</i> .
<b>Performative</b>	An <i>utterance</i> which performs a task merely by being uttered; an utterance which does not just inform but is socially accepted as an event itself.
<b>Pragmatics</b>	The study of social meaning within <i>language</i> . The way that choice of words can affect the <i>Receiver's</i> perception and therefore <i>meaning</i> . See also <i>metamessage</i> .
<b>Predicate</b>	In <i>traditional grammar</i> , what is left in a <i>sentence</i> after the <i>subject</i> has been removed. The <i>verb</i> , direct <i>object</i> and indirect objects in a sentence.
<b>Preposition</b>	See <i>adposition</i> .

<b>Pronoun</b>	In <i>traditional grammar</i> , a word that stands in place of an <i>noun</i> . However, the nature of first and second person ( <i>Sender</i> reference and <i>Receiver</i> reference) differs from the nature of third person (other reference): the Sender and Receiver are known and do not need to be explicitly named, where the third person is an unknown and must be explicitly referenced to give the pronoun meaning. See <i>Anaphor</i> and <i>Cataphor</i> .
<b>Prop</b>	Any non-linguistic device which is used as part of a <i>message</i> . It can be a gesture to explicitly reference an <i>identity</i> without naming it; or a text, which can be quoted.
<b>Property</b>	The attributes of an object which differentiate it as an individual object to a human mind. Properties are shareable between objects.
<b>Reality</b>	What is really out there. Essentially unknowable to humans as we detect reality via our senses and mental processes.
<b>Receiver</b>	Any human or <i>nonhuman</i> who interprets a <i>message</i> from a <i>signal</i> .
<b>Recipient</b>	The person or thing upon which the <i>Action</i> in a <i>message</i> is performed.
<b>Redundancy</b>	Apparently unnecessary extras in a <i>message</i> which add nothing to the message itself, but create clarity and prevent <i>cognitive dissonance</i> between <i>sender</i> and <i>receiver</i> .
<b>Referent</b>	In the Jakobson model, the matter which the <i>message</i> is intended to address. The information to be passed in the message.
<b>Reflexive</b>	Where the <i>Instigator</i> and the <i>Recipient</i> in a <i>message</i> are the same person or object.
<b>Register</b>	A use of <i>language</i> , where the social context of the utterance affects the form of it.
<b>Relevance</b>	One of Grice's maxims, identified by Sperber and Wilson as the main maxim. People seek relevance in communication, regardless of whether the signal actually contained any.
<b>Replacement, Mixed</b>	The use of both <i>phrase replacement</i> and <i>word replacement</i> by a respondent to the survey (see 6.6).
<b>Replacement, Phrase</b>	A behaviour used in the survey (see 6.6), whereby the phrases to be reversed were reversed as single semantic units.
<b>Replacement, Word</b>	A behaviour used in the survey (see 6.6), whereby the words in the phrases to be reversed were reversed individually.
<b>Response, Auditory</b>	The function in the brain which is concerned with the apprehension and dissemination of spoken language.
<b>Response, Glyphic</b>	The function in the brain which is concerned with the apprehension and dissemination of written language.
<b>Response, Emotional</b>	The function in the brain which is concerned with the interpretation of emotional signals. Mostly a function of the amygdala in the brain.
<b>Rheme</b>	In Halliday's model, all of a language construct which is not concerned with the cause of the <i>message</i> . The <i>Action</i> , <i>Recipient</i> and <i>Deixis</i> in a message.
<b>Ring, the</b>	In the Component Grammar Mental Model (diagram 23), the process whereby an idea is refined in terms of image, emotional content and <i>lexis</i> before being passed through <i>simple grammar</i> to <i>lexical grammar</i> for expression.
<b>Rules, Phonological</b>	In Chomsky's <i>Standard Theory of Grammar</i> , the rules whereby a language construct is converted to a set of pronounced sounds.
<b>Rules, Phrase Structure</b>	In Chomsky's <i>Standard Theory of Grammar</i> , the rules that govern the relationships between <i>lexemes</i> to create the <i>deep structure</i> of language.
<b>Rules, Semantic</b>	In Chomsky's <i>Standard Theory of Grammar</i> , the rules that determine the semantic content of a <i>surface structure</i> construct to create the <i>semantic interpretation</i> .
<b>Rules, Transformational</b>	In Chomsky's <i>Standard Theory of Grammar</i> , the rules that convert a <i>deep structure</i> construct to a <i>surface structure</i> construct.
<b>Self-Awareness</b>	Awareness that the self is an entity separate from the rest of reality. Often the mirror test is used: if a creature identifies the object in the mirror as itself then it has self-awareness.
<b>Semantics</b>	The study of <i>signals</i> and <i>messages</i> as containers of <i>meaning</i> .

<b>Sememe</b>	A unit of <i>meaning</i> . Often identified with a <i>lexeme</i> , but not exactly the same. “The Bill” as a term for the Police is arguably two lexemes but one sememe.
<b>Semiotics</b>	The study of signs and messaging conventions, and their relationships to their referent objects.
<b>Sender</b>	The generator of a <i>signal</i> intended as a <i>communication</i> (i.e. containing a <i>message</i> ). Also called the signaller.
<b>Sensory Image</b>	A presentation to the brain by one or more senses of <i>properties</i> which define an <i>identity</i> to the mind.
<b>Sentence</b>	A conventional grouping of written words, containing a <i>subject</i> and <i>predicate</i> construction.
<b>Sign Language</b>	The languages used by deaf communities throughout the World to communicate without conventional speech. They group around two proto-languages, from French-based and British-based conventions.
<b>Signal</b>	A set of sounds or actions or scents or other indicators that are generated by a <i>sender</i> to encode a <i>meaning</i> into a <i>message</i> . The sender is integral to this definition, but not a receiver.
<b>Signified</b>	See <i>Referent</i> .
<b>Signifier</b>	See <i>Sender</i> .
<b>Social Contract</b>	A description of the interpersonal relationships and duties that build up in a cooperative society. The relationships are usually informal and unstated, but the duties are socially binding.
<b>Social Structure</b>	A formalised set of <i>social contracts</i> , establishing roles and duties.
<b>Socialisation</b>	The ability for a species to form <i>social contracts</i> . The process by which a species becomes able to form social contracts.
<b>Spoonerism</b>	A speech error where individual <i>phonemes</i> or syllables are swapped in a message, e.g. wire fool instead of firewall. Named after William Spooner, who produced many of these in his lifetime.
<b>Strategy</b>	Used in this paper to describe a linguistic expression choice. Especially applied to the Survey in 6.6, where phrase replacement and word replacement strategies are identified.
<b>Structure, Deep</b>	In Chomsky’s <i>Standard Theory of Grammar</i> , the basic formant of language constructs. The same for all individuals and all languages.
<b>Structure, Surface</b>	In Chomsky’s <i>Standard Theory of Grammar</i> , the detailed formant of language constructs. Differs in different languages.
<b>Subject</b>	In <i>Traditional grammar</i> , the part of a <i>sentence</i> identified as the <i>instigator</i> of the <i>action</i> in the sentence.
<b>Symbol</b>	A word or sign that can represent not just an object or the properties of the object (see <i>icon</i> ), nor just a class of similar objects sharing some properties (see <i>index</i> ), but objects or properties only obliquely related to the original object.
<b>Syntax</b>	The rules by which <i>lexemes</i> can be combined to create viable <i>messages</i> . Often used as a synonym for <i>grammar</i> .
<b>Theme</b>	In Halliday’s model, that part of a language construct which is the cause of the <i>message</i> . The <i>Instigator</i> in a message.
<b>Thread</b>	A term used on the Internet to describe a linked series of emails. If an email is sent to more than one person then it is possible to receive multiple replies. If these are then responded to by multiple people then a complex weave of messages can be set in motion. However, each individual email can be traced back to its origin through its thread.
<b>Tool</b>	Any object used to achieve an end. In humans, tools were originally any object that came to hand to carry out the task. Later they were crafted to make them more suited to the task. Finally they were built from scratch from materials apparently unrelated to the task to be achieved.
<b>Transactional Act</b>	In a <i>social contract</i> environment, an act designed to create obligation or duty in the receiver of the act. An act carried out to meet an obligation or duty.
<b>Verb</b>	In <i>traditional grammar</i> , the part of the sentence that allocates the <i>action</i> .
<b>Verb Phrase</b>	A set of words acting in place of a single <i>verb</i> .

<b>Verb, Phrasal</b>	A <i>verb</i> which has an <i>adposition</i> suffixed. Sometimes only idiosyntax can determine a phrasal verb from a verb plus indirect object.
<b>Vocabulary</b>	See <i>Lexis</i> .
<b>Word</b>	See <i>Lexeme</i> .
<b>Word, Content</b>	In <i>traditional grammar</i> , a word which allocates an <i>action</i> or an <i>identity</i> to a <i>message</i> . See also <i>function words</i> .
<b>Word, Function</b>	In <i>traditional grammar</i> , a word which does not allocate an <i>action</i> or <i>identity</i> to a <i>message</i> . Mostly identified with <i>deixis</i> and <i>connectivity</i> , or with <i>lexical grammar</i> construction.
<b>Yerkes Project</b>	A series of studies of cognition in the four great ape species. Named after the Yerkes Primate Research Facility (in turn named for the initial investigators in this field), it has come to be a general term for all ape cognition studies.

## Appendix I – Survey conducted June to August 1999

### English Language Survey

*The purpose of this survey is to identify attitudes to words in English. It is not a test, there are no right answers, we are only trying to identify your opinions about some aspects of English usage. Please answer all the questions you wish to. Please do not talk to others about your answers, we want to hear your opinions.*

#### Section 1

**Age:** \_\_\_\_\_

**Gender:** Male/Female

**Is English your first language:** Yes/No

**Educational level up to (including current study):**

O Level (age 16) / A level (age 18) / Degree level

#### Section 2

*Please give the opposite meaning (if any) of the following:*

<b>The old black bull</b>	_____
<b>Hoping for a new dream</b>	_____
<b>The Northern lights</b>	_____
<b>Above and beyond all duty</b>	_____
<b>Moving in ever-decreasing circles</b>	_____
<b>The great white hope</b>	_____
<b>Once upon a time</b>	_____
<b>Total direct communication</b>	_____
<b>The love of his life</b>	_____
<b>Quietly at home with the children</b>	_____

#### Section 3

*Action words are words that describe things happening, where object words just describe things. Please indicate the action words (if any) in the following:*

**To infinity and beyond**  
**Sealed with a kiss**  
**Seekers of the truth**

**Now or never**  
**Do pigs have wings?**  
**Beyond the blue horizon**  
**A failure of design**  
**Where next?**  
**Out of Africa**  
**The World is round**  
**Putting on the agony**  
**The quiet of the night**

#### Section 4

*Please indicate all the words that have a similar meaning to the first word on the line:*

<u>Friend</u>	Pal	Acquaintance	Relation	Workmate	Colleague
<u>Grey</u>	Misty	Dark	Blue	Cloudy	Green
<u>Oval</u>	Circle	Round	Long	Egg	Ellipse
<u>Normal</u>	Usual	Real	Acceptable	True	Unexceptional
<u>North</u>	Up	Cold	Top	Polar	Direction
<u>Language</u>	Linguistics	Speech	Grammar	Writing	Text
<u>Shoe</u>	Slipper	Boot	Sandal	Trainer	Moccasin
<u>Particle</u>	Piece	Section	Unit	Atom	Speck
<u>Attack</u>	Invasion	Hit	Defend	Destroy	Overcome
<u>Hope</u>	Desire	Want	Promise	Wish	Dream

#### Section 5

*Please insert the word you think goes best in the gap:*

**Smoking is unfair \_\_\_\_\_ other employees**

**I will try \_\_\_\_\_ do it today**

**Toadstools are not to be mistaken \_\_\_\_\_ mushrooms**

**We will remove the tooth \_\_\_\_\_ your next appointment**

**It stands alone and neither takes nor gives meaning \_\_\_\_\_ the argument**

**The bus company is sorry \_\_\_\_\_ any delay caused by the breakdown**

**She travelled on the train \_\_\_\_\_ York**

**Do not add or subtract the cost \_\_\_\_\_ the total**

## Appendix II – Email Discussion of the Component Grammar Mental model

From: Martin Edwardes [<mailto:martin.edwardes@lineone.net>]  
 Sent: Thursday, 08 July, 1999 15:47  
 The discussion of words and thought, "verbalisers" and "visualisers" has set me thinking, so I have come up with the following model. Please check it for me and see if it looks reasonable to you. Does it describe the way you think/vocalise? Or is it yet another pike of multi-coloured cack?  
 Thanks for your interest, I value your contributions.

### Thread 1

From: Scott Gomez <[pglyph@primenet.com](mailto:pglyph@primenet.com)>  
 Date: 09 July 1999 08:11  
 That makes sense to me. Why would you separate writing, though?

From: Martin Edwardes [<mailto:martin.edwardes@lineone.net>]  
 Sent: Thursday, 10 July, 1999 00:14  
 I've just got this feeling that generating marks on paper (Computer screen?) involves a different process than sound production. Although I think the inputs to writing must be the same as for speech.

### Thread 2

From: Caryl McKay <[cmmckay@sprint.ca](mailto:cmmckay@sprint.ca)>  
 Date: 09 July 1999 22:38  
 I found this quite challenging. It is an admirable effort to analyze or describe a process which is almost impossible to explain. I think, to a great extent, it reflects what some people here have been saying about the auditory/ visualizing perception of ideas.  
 I found that somehow the description of "listening" resonated with me. But I would add that some sounds, particularly those associated with music or poetry, don't give me a visual image, but I immediately perceive them emotionally or physically.  
 If your model is only referring to verbalized sound, I think I would still say there are certain words, phrases or sentences that I do not perceive intellectually or emotionally, but in the gut or in the chest. My response is physical - such as pain or excitement or arousal, with no pictures or words in my head at all. So certain words/ phrases or tones of voice have weight of themselves. This of course can lead me to totally misunderstand what is being said, since my perception has been short-circuited by my own preconceptions or ideas or feelings.

From: Martin Edwardes <[martin.edwardes@lineone.net](mailto:martin.edwardes@lineone.net)>  
 Date: Friday, July 09, 1999 8:24 PM  
 I'm going to have to think about that. Whether the stimulation is felt in the mind or the body, I would class it as an emotional response. This may not be valid, I will have to see what the psychologists say.

From: Caryl McKay <[cmmckay@sprint.ca](mailto:cmmckay@sprint.ca)>  
 Date: 10 July 1999 01:09  
 I see your point. Psychosomatic reactions do originate from the mind/emotions. But if my first reaction is physical, and I have somehow short-circuited those thoughts and feelings, is not the physical the actual first thing that happens?

### Thread 3

From: Rae Ackerman <[rae\\_ackerman@city.vancouver.bc.ca](mailto:rae_ackerman@city.vancouver.bc.ca)>  
 Date: 09 July 1999 02:25  
 The diagram doesn't do it for me in terms of how I understand the concept. No nice software at hand so try this, very linear representation.  
 Auditory Person  
 Stimulus applied to eardrum (words, music eg.)  
 emotional response or idea  
 turns it into words  
 writes or speaks or composes.  
 Visual Person  
 Stimulus applied to retina (light, colour, pictures, images etc.)  
 emotional response or idea  
 turns into words or pictures  
 speaks, writes or draws/paints/sculpts.

From: Martin Edwardes

Date: Friday, July 09, 1999 5:05PM

Your model has two problems from my point of view: There is no separation of emotional response and idea, and Jan indicated that, for her, there is; And there is no mechanism for the actual storage of inputs - they pass from input to output. Many ideas have no external input to generate their verbal output - such as "I fancy an ice cream". The stimulus may be heat or hunger, but it is my stimulus. And the ideation of an ice cream from the stimulus is also idiosyncratic - it could have been "I fancy a nice, cool tomato". No external stimulus determined my choice of foodstuff.

However, you have indicated a visual input channel, and a non-language auditory channel. In my model these probably feeds directly into the visual image (read identified experience(?); then through to emotion, ideation and syntax; then to lexical selection (if words are actually needed). I think these will have to be added to the model.

From: Rae Ackerman <rae\_ackerman@city.vancouver.bc.ca>

Date: 10 July 1999 00:51

I agree with what you added. I was seeking to separate your model into 2 different ways of experiencing stimulus leading to communication. This is what I understood the concept of "some people are (primarily) auditory and some people are (primarily) visual" to be about.

There is absolutely a need to add to this, the means of "original thought", assuming there is such a thing, free from external stimulus.

#### Thread 4

From: Gil Woodstrom [mailto:Samiel@email.msn.com]

Sent: Saturday, July 10, 1999 7:13 PM

OK, here's my response.

For some reason I "think" that what you're doing might be ass-backwards?

The thinking thing that happens in our brains is a response rather than a generation. We are prompted to think by visuals, emotions and sounds. Words to express this came later, so I agree that language (and writing) is a separate issue.

If it was my diagram I would put visuals, emotions and sounds in the middle and the various ways of thinking feeding off those.

From: David Heeding <david\_heeding@email.msn.com>

Date: 11 July 1999 02:45

**I think all of the time by blocking out external input. I think those inputs are stored information - memories if you will. It's true that I can't think without information - nothing to think about. But it's not just a reflexive action. And even where it might appear to be, the prompting input is probably a small minority of the information used in the process.**

**No, wait, lets approach this differently. What you describe sounds to me like cues to thinking. (Which may or may not prompt immediate thought and may or may not be combined with other past and future cues to finally prompt thought.) I don't doubt that happens, but I'm not sure what it has to do with the model, which I take to be intended to make sense out of the relationship between thought and expression through language - spoken in this case.**

**Unfortunately I foolishly deleted the picture with my daily mail and can't remember now why there were multiple boxes at the bottom of the picture. But I think the the only input and output being examined is spoken word. (Plus the idea that expression can remain internal.) A considerable part of it is, I think, about decoding and encoding the language. In the case where somebody speaks to you, then those words are the prompt to thought in the same sense that you speak of other sensory input. The reverse doesn't really deal with the source of the idea - which could be anything from hunger pangs in your belly to remembering to do more work on an analysis of Gregorian chants that you've been spending months on. I'm not sure it's important what the source is.**

**Let me try it a different way again (and I'll ask Martin if I'm anywhere near the mark here), the way I see the model is that the center (at the top) is roughly akin to understanding. The swirl around it is the thinking process that creates understanding from outside input (in this case, spoken language) and, at the same time, the thinking process that takes understanding and transforms it into expression. In some cases there might be a feedback loop where existing understanding is thought about and then returned with greater understanding. Not really touched upon in the model, but I think implied by the thinking elements is that a store of remembered words, syntax, images (maybe senses would be better than images) and emotions are used in that thinking process. Sometimes that memory is brand new. And sometimes new memories are created through the process (such as a new word or a created image). All are part of the information store, but aren't understanding in themselves. To me it makes sense for the center to be as it is, because that's the part that embodies the person. The smell of a flower may be the prompt to a thought, but it needs to make its way to that center to have meaning, and then back out again to be described.**

From: Martin Edwardes

Sent: Thursday, July 11, 1999 9:32 AM

David, that is spot on to what I was trying to say.

## Thread 5

From: David Heeding <david\_heeding@email.msn.com>

Date: 10 July 1999 00:27

**It seems to reasonably encompass the various perceptions brought up here. (Actually, it's almost disappointing to see all the variations put together into a coherent system. I sort of preferred the idea of an indecipherable chaos.) I'm not sure why the lexical does not feed the image on the listening side. And am curious why writing must be considered separately - and so emphatically so. But neither question is especially important to the validity of the model as a whole.**

**Now then, is there anything about the model that is striking to you?**

From: Martin Edwardes [mailto:martin.edwardes@lineone.net]

Sent: Saturday, July 10, 1999 8:05 AM

It looks like a little man with his hands on his hips?

C'mon, spill. I'm too close to spot the obvious.

From: David Heeding <david\_heeding@email.msn.com>

Date: 10 July 1999 18:41

**No, no. I was serious. (If you want to ask the little man out for a date or something, that's your affair.) I was wondering what you had gotten out of the effort.**

From: Martin Edwardes [mailto:martin.edwardes@lineone.net]

Sent: Saturday, July 10, 1999 5:21 PM

Surprisingly, although it isn't obvious from the model, it has vindicated my Simple grammar/Lexis/Lexical grammar model. The other thing is that I would really like to do it in three dimensions to show the way everything interconnects around the idea. But it seems to work as a 2-d. I suppose another thing is the regular shape - but I like balanced diagrams.

From: David Heeding <david\_heeding@email.msn.com>

Date: 11 July 1999 02:56

**Sigh. Just when I think I'm grasping this, I of course don't know what you're talking about. What's the simple grammar/Lexis/Lexical/grammar model?**

From: Martin Edwardes [mailto:martin.edwardes@lineone.net]

Sent: Sunday, July 11, 1999 5:52 AM

Subject: Re: Please check for stupidity

There's no reason why you should know about the SG/L/LG model, since it is another of my weird ideas. The idea is that grammar actually comes in two parts: an understanding of who is doing what to who, with what, where, etc. (simple grammar); and the imposition of structure on selected words by amending those words or adding new words (lexical grammar). Grammar is not just about the process of adjusting language (lexical grammar), it is also the expression of interrelationships of things in the message (simple grammar). A brief summary of how I see it working is below:

[Diagram 16 – The Component Grammar Process Model]

I would suggest a model as in the diagram above, with the Lexical layer neither totally overlying Simple Grammar, nor totally underlying Lexical Grammar. This gives us five relationships between the message, grammar and lexis.

(a) *Simple Grammar alone*. This is non-language communication, as used by animals and humans alike (frowns, smiles, subvocalisations, etc.).

(b) *Simple Grammar through a Lexical Layer*. This consists of simple word form messages without apparent grammatical content but with clear meaning (such as *You! Here! Now!*).

(c) *Simple Grammar through a Lexical Layer, with Lexical Grammar overlaid*. This is where the majority of human linguistic communication occurs. To take a simple form, the expression of Instigator/Action/Recipient is expressed through an English lexical layer as Subject/Verb/Object using words, as in *Janet ignores John*.

(d) *Lexical Grammar with an underlying Lexical Layer*. This is where the process of hypothecation occurs, where ideas unrelated to reality come from. The aesthetic function of signalling may well be expressed at this point. But this is perhaps the least simple of the five areas to describe, and I would willingly accept an argument that this relationship does not actually exist.

(e) *Lexical Grammar by itself*. This gives grammatical nonsense, and is not a good message conveyor. We see this happening in nonsense poetry (*'Twas brillig, and the slithy toves did gyre and gimble in the wabe...*); in the medical condition of Wernicke's aphasia; and, more mundanely, when we hear a foreign language we do not understand.

And now you begin to see why I'm calling it the Great Linguistics Picture Book.

From: David Heeding <david\_heeding@email.msn.com>

Date: 11 July 1999 14:26

**Ok. And how do you see this model vindicated by the other?**

**Do you suppose D) is where puns are born?**

**I'll have to think about D) & E) some more. I'm not sure that they're not really the same - whether the lexical layer can have any more meaning than slithy tove without the underlying simple grammar.**

**Yet I think there has to be a lot of activity at the border of C & D at least. What you call**

hypothecation (is that really a word?) I think needs to be accounted for. At least it does from my point of view of language serving the thinking process.

I used to use graphs a lot in seminars myself. And I remember a peril with them. While they might be effective in illustrating a relationship I was trying to describe, I found myself arguing the graph a lot rather than the actual relationship. People insisted on expanding upon perceived implications of the picture that had little to do with the concept that was supposed to be depicted. The same kind of problem one often has with analogies. But I like the pictures anyway. There is nothing quite so daunting as a treatise of nothing but words.

## Thread 6

From: Gil Woodstrom <[Samiel@email.msn.com](mailto:Samiel@email.msn.com)>

Date: 11 July 1999 00:27

OK, here's my response. For some reason I "think" that what you're doing might be ass-backwards? The thinking thing that happens in our brains is a response rather than a generation. We are prompted to think by visuals, emotions and sounds. Words to express this came later, so I agree that language (and writing) is a separate issue.

If it was my diagram I would put visuals, emotions and sounds in the middle and the various ways of thinking feeding off those.

From: Martin Edwardes

Sent: Sunday, July 11, 1999 4:29 AM

Are you saying that our thinking is a random thing, generated by visuals, emotions and sounds? And that, without these stimuli, thought doesn't happen? I agree that words can come later, but I also think that words can be the instigators of thought (otherwise, how does listening to someone speaking work?).

My model is specifically a model of speech generation and understanding. I don't really see it as a general model of cognition. What you are describing I would see as going on in that box in the middle, where ideas are generated, but that isn't the area I'm trying to explain.

From: Gil Woodstrom

Date: Sunday, July 11, 1999 9:00AM

Yeah, I just read Steven's email and realized that I was on the wrong track entirely. Let me have another think...

From: Rae Ackerman [rae\\_ackerman@city.vancouver.bc.ca](mailto:rae_ackerman@city.vancouver.bc.ca)>

Date: 13 July 1999 02:40

Yep. I think I will back off too and see what develops.

From: Martin Edwardes [<mailto:martin.edwardes@lineone.net>]

Sent: Thursday, July 15, 1999 2:50 PM

This is what has developed. I think I have got everyone's views in.

From: David Heeding <[david\\_heeding@email.msn.com](mailto:david_heeding@email.msn.com)>

Date: 20 July 1999 01:11

I had to think about this a bit because I'm not as familiar and comfortable with the concepts of simple grammar and lexical grammar as you are. You covered a lot of angles and I mostly like it. The only question I have concerns, I think, the lexical grammar box. It seems a tad removed from the feedback loop to and from the idea. Not to be too proprietary about the proposition I made a while back, but I thought part of what triggered this was the idea of language serving as a tool of thinking and partly constructed for that purpose. That's not evident to me here. Perhaps that's not part of what this diagram is for, I don't know.

From: Martin Edwardes [<mailto:martin.edwardes@lineone.net>]

Sent: July 20, 1999 22:02

The model is more to show language as a product of thought, and as a conveyor of meaning between people. It's an attempt to show how language comes from and goes to thought and acts as a conduit of meaning.

I suppose an analogy would be language and thought as two cities with a connecting railway of meaning (grammar and lexis) between them. I'm interested in how the citizens move around in Language, and how and why they catch the train to or from Thought. But I have no interest in what people do in Thought. It may be that the only way to get between different parts of Thought is to go to Language and then back to Thought. That interests me, but only in the way they change trains in Language. I will know there is some kind of barrier in Thought, but the nature of or reason for that barrier is outside of my purview.

The lexical grammar box is deliberately removed from the idea, it is a translation of simple grammar (read "identification of what's happening" if that makes it clearer), words (shorthand descriptions), and the emotions that the idea has generated. For some people I suspect it is activated early as part of the idea feedback cycle, for others it is only activated towards the end of the feedback cycle. But it is needed to pull all the other factors together to produce viable language utterances.

To tell someone "the ballroom in the town hall has caught fire" you need the grammatical structures represented by "the" (one specific ballroom, one specific town hall), "in" (the ballroom is contained within the town hall), and "has caught" (the action of catching fire has already happened and been completed, although the action of being on fire is possibly implied as continuing). This last can be contrasted with "is on fire", where the action of being afire is current and ongoing. Also "has caught" implies that the fire is happening to the ballroom and not vice versa. These sorts of linguistic meaning effects are too subtle to be part of simple grammar, and are clearly not just lexically based. Note that any image of the scene will involve fire, the ballroom and the town hall; but it is very unlikely to involve "in" or temporality. In "the fire in the town hall has

caught the ballroom" the fire started outside the ballroom and moved in, but the image of the ballroom in the town hall being on fire would be pretty much the same.

Once again, I'm not sure whether I'm talking hokum. To a large extent, Simple/Lexical grammar is the question that my MA is about.

### From Thread 7

From: [jan\\_norwood@msn.com](mailto:jan_norwood@msn.com)

Date: Sunday, July 04, 1999 9:00PM

Marie,

After reading it aloud, not just once but 20 times, I'm afraid I did not get it, although I really tried. I did not get it on the bus, I did not get it in a truss. I did not get it in my room, I did not get it with a broom.

Interesting it is this linguistics you toy with if I'm understanding what you say. Do words have meaning in and of themselves or only as a function of the agenda, purpose or context/experience of the speaker?

I have great difficulty expressing my thought in words. At times I am totally unable to express my thoughts at all because I have to translate them first into words, they come into being full blown often with no immediate superimposition of the concepts they describe. In the area of perception, sometimes I see things that are ordinary things and first see them only as how the visual input delivers before I recognize that I am seeing (for example) a toilet and know it in terms of it's function. Van Gogh's chair painting makes me think he did that too. It is weird and treacherous to have to keep translating my sensum into some words that others will understand. To do this, I have to put things in the context of the listener as best I can, and always requires that I blow past my own thought of "chair" and recall all the functions chairs have. And I generally tried to avoid these kinds of things all together.

The word chair evokes a mental image of the chair I sat in at my mother's table or the oversize "big chairs" that my father always had. I think the nature of the beast is that language can only serve as a means to express any given speaker's POI. Or his purpose or what not. Although mummeries peoples seem possessed of enough commonality OD experience a chair as a place to sit.

Does this makes any sense at all.

Oh, and one final thing. I never I don't not think in words, It's kind of tough, since I first have to identify the feeling or thought

Is the medium the message, or is and what does that mean?

Clarea

From: Rae Ackerman

Date: July 07, 1999 16:40

You suggest an additional "type" - so we may have people who are auditory, people who are visual and people who are, what? conceptual/emotional? Makes a lot of sense to me. I wonder what other primary means of perception might exist? Sensory? Temporal? Spiritual?

## Appendix III - Synopsis of MA Dissertation

This dissertation forms the whole of the work for assessment in the award of the MA. The objective of the course of study was to investigate the nature of grammar in language when analysed on the basis of components. To do this the components of grammar first had to be identified and classified by type. While the first three (Action, Instigator, Recipient) are well documented in various forms by many authors, the last two (Deixis and Connectivity) were less obvious. These components had to be tested against real language structures to ensure that they provided a complete and useful set.

With this working set of components, it became clear that they could be found in general communication and not just language. It was necessary to produce both a communication model for the components, and a semiotic model linking the components with established language models. The question of the Chomskyan language model also had to be addressed, as it places language outside of general communication. It was necessary to reintegrate it, and for this purpose the symbolic nature of words was used as a bridge between the simple grammar of components and the complex grammar created by language.

Finally, it became clear that the pictorial structure of a model affects its apprehension both structurally (what it consists of) and processively (how it works). It became necessary to review all models in this light, and to raise caveats about the modelling process. However, several useful, unexpected relationships came out of this review.

This MA required information to be gathered not just from areas of Linguistics study but also the areas of Anthropology and Zoology. Philosophy, especially the philosophy of communication, also had to be reviewed. This required extensive reading, and several Linguistics courses were undertaken to provide inspiration and new directions of study.