The World of Language

A Carrollinian Canvas

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Acknowledgements

This book is the result of a collective effort, parcelled out over some length of time. Particularly when I was floundering at the start of it all, but at later stages as well, exploratory conversations with Cecile le Roux helped me in many ways to get a clearer idea of what I was trying to do. Several versions of the text were read by Walter Winckler, who with characteristic acuity suggested lots of improvements in both content and presentation. If the final version is readable at all, much of the credit for this should go his way. The physical production of the working-paper version, including notably the word processing, was taken care of with superb skill by Christine Smit. And technical flaws of various kinds that had marred the earlier versions of the text were weeded out by Theresa Biberauer. To all these colleagues, I would like to express my sincere thanks. For their sustained and unstinting support. And for putting up with me with great good humour.

As I sat reading and rereading the Alice stories, my wife Hanna would often catch me laughing out loud. (Now and then I may even have ventured, who knows, to take a turn in one of those unlikely exchanges that Lewis Carroll so excels at entangling his characters in.) Hanna, though, with true understanding not once commented (openly) that my doings put her in mind of the Hatter's eccentricities.

R.P.B.

Of Scopes: Micro- and Macro-

> *'All this time the Guard was looking at [Alice], first through a telescope, then through a microscope, and then through an opera-glass'.*
>
> [Lewis Carroll, *Through the Looking-Glass and What Alice Found There*, p.218]

This book paints a picture of the world of language as a whole: a picture showing clearly both what its large-scale features are and how they hang together. 'But what makes that sort of picture special?', you might wonder. 'Surely producing a picture of this sort is part of linguists' stock-in-trade?' In terms of what many linguists profess to be doing, yes indeed. In terms of how they routinely spend their days, though, certainly not. Ordinary linguists, you see, have been bent on taking the world of language apart, rather than on picturing it as a whole. And, in the spirit of the trade, they have been looking at ever smaller bits of this world. In fact, many linguists have become so glued to their microscopes that they completely forget to step back once in a while to view the whole from a suitable distance. As a result, there are many technical texts that picture the microtexture of the world of language in all its fine-grained splendour. One can indeed rightly marvel at the detail in which many microscopic analyses reveal this world's finer fibres. One also misses something, however: some picture of the general architecture and dynamics of the world of language as a whole.

How are we to get some glimpse of the large-scale features of the world of language? Do we need some magical inversion that will turn those microscopic analyses into a large-scale atlas? Perhaps not neccessarily a magical one. Perhaps instead we can take a lead from the cosmologists, a fraternity of scholars eminently experienced in the study of enormous places. Scientific cosmology, after all, has a goal very similar to the one that interests us: to portray the universe as a whole, showing what its large-scale features are and showing how these hang together. To get this job done, observational astronomers and theoretical cosmologists work together, with the astronomers gathering

observational clues about the universe, and the cosmologists piecing these clues together and interpreting them in revealing ways.

The instruments of observational astronomers, of course, are of no use to linguists. (Nor would the Guard's opera-glass do the trick!) The world of language is largely hidden even from the technologized eye. No instrument or sense organ, however souped up, can tell us much about this world. We have to 'look for' our basic data in a different way. And this is where good microscopic analyses of the world of language are indispensable. They do not provide us with readily invertible pictures of its large-scale features, true enough; they do however offer us microlinguistic clues to these features. By using these clues in the right way, we can make claims about the large-scale features of the world of language that are firmly, if indirectly, grounded in empirical fact.

The microlinguistic clues in question have to be properly interpreted, of course, just as astronomical observations have to be interpreted by theoretical cosmologists. It is only by interpreting the clues that theoretical cosmologists can hope to come up with a picture of the universe as a whole. The pictures they draw of the universe take the form of conceptual models. Conceptual modelling, the means by which the pictures are drawn, may be likened to a 'macroscope'. If you do not know what a macroscope is, you can imagine it easily enough: an instrument, the counterpart of a microscope, that enables the mind's eye to 'see' how the large-scale features of something really complex interlink to form the basic architecture and dynamics of the whole.

It is one thing to have a fair idea of what a macroscope can show you. Trying one's hand at twiddling its knobs, though, is a different matter altogether. Which means that macroscopic pictures run the risk of being badly blurred in some areas and downright wrong in others. Seasoned cosmologists know from experience that macroscopic pictures of big places are never accurate the first time round. It is this knowledge that

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prompted John Wheeler, a famous member of their fraternity, to declare: 'Our whole problem is to make the mistakes as fast as possible' (quoted by Karl Popper in THES, 24 July 1992, p. 15).

To make sure that the picture of the world of language presented below is sufficiently focused, I have tapped Noam Chomsky's formidable resources. An extraordinary linguist, he excels both at making detailed microscopic analyses of the finer fibres of this world. And at using microlinguistic clues in staking out its large-scale features, which makes his work a rich source of macroscopic insights as well. The picture that I offer of the general architecture and dynamics of this vast linguistic place is not narrowly Chomskyan, however. It includes various large-scale linguistic features that lie outside Chomsky's immediate concerns. Moreover, Chomskyan ideas are as far as possible not presented in their original undiluted form, in which many readers may find them discouragingly 'technical'. I have used notes for referring readers to technical work by Chomsky and a wide variety of other scholars that underpin my picture. These references have been selected, moreover, as pointers to 'further reading'.

Sharpness of focus, however, is only one of the two basic requirements for a good picture of the world of language: the right style of painting is another. The picture needs to be painted in a style that will tempt newcomers to have their first good look at the world of language. And to induce others to look afresh at a world which they may feel has no woods but only trees. A canvas covered in the conventional way with technicalities is guaranteed to fall short of this requirement of style. That is why I have enlisted the aid of Lewis Carroll, a past master at painting new worlds in a delightfully refreshing way.[1] And, as a back-up, I have engaged Carroll's latter-day understudy, Gilbert Adair.[2]

Macroscopic. Focused. Painted with a Carrollinian brush. These are properties that my picture of the world of language will have, I hope. It won't be a 'full picture', though.

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Comprehensiveness is in fact way beyond its reach. Such a picture presupposes far more knowledge of the large-scale features of this world than I have at present. And for picturing such an enormous domain 'in full' a single canvas is in any event not enough.

1 A Grand Survey

'Of course the first thing to do was to make a grand survey of the country [Alice] was going to travel through' [TLG 215]

What do you make of a world where people can shut up or open out like telescopes by taking mysterious substances? Or of one where it takes all the running that you can do to stay in the same place? The first of these is Wonderland, of course, the world that Alice tumbled into down a rabbit-hole. The second of these worlds she got into by passing through a looking glass. Of the many famous make-believe worlds, few, if any, are so crammed with things enchanting as the worlds that Alice visited.

But truth is stranger than fiction, as the saying goes. And, indeed, some real worlds may intrigue us even more than the dreamworlds created by Lewis Carroll. One such is the real world of human language. Real people acquire languages without consciously learning them. In using the languages they know, they are endlessly creative. What they mean will often differ vastly from what they are actually saying; yet they are fully understood. And, faced by severe need, real people can create new languages almost overnight. And so on, and so forth.

Still more fascinating, however, are the intricate mechanisms that give rise to these phenomena. On this score Wonderland and Looking Glass Country are no match for the real world of language. A little girl growing in a wink to be two miles high, a caterpillar with folded arms smoking a long hookah, a baby turning into a pig, and a cat that disappears, leaving only its smile behind, engrossing as they may be, are quite shallow phenomena. That is, they are not products of the workings of hidden mechanisms --- of invisible things, processes, and so on --- that would allow one to make sense of them in some systematic way.

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The hidden mechanisms, in turn, are as they are and work as they work because the world of language as a whole has certain large-scale features. These features of this world determine both its general architecture and its dynamics. To begin to understand the world of language at all adequately, one has to come to grips with this architecture and these dynamics. The chapters that follow present a conceptual picture of the large-scale features that characterize the world of language as a whole.

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Finding your bearings in a new world can be an unsettling business. This, Alice discovered soon enough in Looking Glass Country where, in order to get to a place, she had to walk away from it. And where she found, to her amazement, that people lived backwards in time, remembering best the things that happened the week after next. There is a lot to be said, after all, for not entering new territory by tumbling into it head over heels! So let's break off our descent into the world of language for a while and first survey its large-scale features from a distance. This will be all the easier, once we have settled a point of terminology.

I have used the phrase 'the world of language' as a sort of terminological crutch to get us this far. (Though the idea of using a crutch for falling down a hole may smack of Carrollinian paradox!) But this phrase is a trifle unwieldy, as crutches often are. So in some contexts, we will use the more compact phrase 'linguistic reality' as a synonym for 'the world of language'. The term 'reality' means, to put it plainly, 'all those things that exist'.

What, then, are the large-scale or macro(scopic) features that characterize linguistic reality, collectively determining its general architecture and dynamics? The following are central among these features:

(F1) Linguistic reality is (multi-)**layered**. The four basic layers of linguistic reality are those comprising language products, language behaviour, language capacities, and language itself.

(F2) Linguistic reality is (multi-)**dimensional**. These dimensions include those of function, form, structure, use, substance, diversity, diachrony, phylogeny, ontogeny, and physical bases.

(F3) Linguistic reality is (poly-)**systemic**. For example, a person's faculty for language consists of two basic systems: the capacity for (acquiring) language and the (acquired) knowledge of language. Knowledge of language, in turn, is made up of such subsystems as grammatical competence, pragmatic competence and a conceptual system.

(F4) Linguistic reality is (multi-)**domainal**. The domains to which linguistic things, events and processes belong include the material, the mental/biological, the social and possibly the abstract.

(F5) Linguistic reality is **dynamic**. Various kinds of events, processes, changes, and so on constantly occur within this reality.

(F6) Linguistic reality is (multiply) **interconnected**. The various ingredients of linguistic reality are interlinked in specific ways; as a whole, linguistic reality is in turn interconnected with other, nonlinguistic, realities.

(F7) Linguistic reality is **lawful**. It is governed by various kinds of laws, principles, constraints, rules, maxims, norms and so on.

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The first four features, (F1)-(F4), reflect the major ways in which linguistic reality is structured; the final three features, (F5)-(F7), reflect pervasive properties of much of what this reality contains. In regard to basic architecture, then, we metaphorically picture **linguistic reality** as a place organized in terms of interconnected layers, dimensions, systems and domains in which linguistic things, events and processes hang together in lawful ways.

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In exploring a particular large-scale feature of linguistic reality, we will be guided by three main questions:

(Q1) How is the feature concretely manifested or instantiated by specific linguistic things, processes, and so on?

(Q2) What is the general nature of the feature?

(Q3) How is this feature interlinked with others?

These questions sound a lot more straightforward, it is true, than the Mad Hatter's famous riddle 'Why is a raven like a writing-desk?' Good answers to them are not there for the picking, though: linguistic reality is a vast and complex domain, and has not been staked out systematically from a macroscopic perspective. Which means that any current answers to questions (Q1)-(Q3) are of necessity restricted in scope and depth. And, above all, that these answers cannot but be tentative. Nevertheless, it will become clear that linguists can deal with these questions in an insightful way. Indeed, linguists are much better off than the Hatter and his companions, who were completely nonplussed by the 'raven' riddle:

> '"Have you guessed the riddle yet?" the Hatter said, turning to Alice again.
> "No, I give it up," Alice replied. "What's the answer?"

"I haven't the slightest idea", said the Hatter.

"Nor I," said the March Hare.

Alice sighed wearily. "I think you might do something better with the time," she said, "than wasting it in asking riddles that have no answers."' [*AIW* 97]

Which brings us to how this book is organized. First off, let me ask you, can you imagine a kind of world that is all surface with nothing underneath? Not even Lewis Carroll tried his hand, or rather imagination, at conjuring up such a place. Building a conceptual model of linguistic reality, fortunately, does not require such mental acrobatics. For fundamental among the large-scale features of linguistic reality is that it is made up of various layers. So what we will do below is to go over --- or rather through! --- the four main layers of linguistic reality: that of language products in chapter 2, that of language behaviour in chapter 3, that of language capacities in chapter 4, and that of language itself in chapter 5. By focusing on these layers one after another, we will automatically get instantiations of large-scale features (F2)-(F7) in the sights of our macroscope. In chapter 6, we conclude our inspection of the world of language by considering two of the possible ways in which language may have evolved in our species.

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2 Its Uttered Crust

> *'The Queen turned crimson with fury, and, after glaring at [Alice] for a moment like a wild beast, began screaming, "Off with her head! Off with ---"' [AIW 109]*

During the Mad Teaparty in Wonderland, Alice and the Hatter talked at some length about what their watches could and could not do. Here is a snatch of their curious conversation:

> ... 'Does *your* watch tell you what year it is?' [asked the Hatter.]
>
> 'Of course not,' Alice replied very readily: 'but that's because it stays the same year for such a long time together.'
>
> 'Which is just the case with *mine*,' said the Hatter.
>
> Alice felt dreadfully puzzled. The Hatter's remark seemed to her to have no sort of meaning in it, and yet, it was certainly English.' [*AIW* 96-97]

This passage by Lewis Carroll is made up of written utterances. Some of these he uses to represent, in writing, utterances spoken by Alice or the Hatter. Others he uses to describe Alice's judgements about some of the Hatter's utterances or about the meaning of those utterances. Alice judges, for instance, that the Hatter's utterance *Which is just the case with mine* has no meaning but is certainly (good) English. The quoted passage furnishes examples, in fact, of the two basic kinds of products of the use of language: utterances and people's judgements about utterances. As **language products**, such utterances and judgements are the ingredients of the **crust** or **surface layer** of linguistic reality. Let us look at these two kinds of ingredients in turn.

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2.1 Linguistic utterances

(Of sighing Gnats, vanishing Cats and tippling Rats)

Utterances --- or linguistic utterances --- are what people produce by speaking, writing, and signing. Here are some more examples of utterances (they will be used a little later to illustrate some general points):

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1a Alice sighed out of frustration.
b The Gnat sighed itself out of existence.
c The Gnat sighed itself.
d The Gnat sighed existence.

2a The Cat vanished, leaving its grin behind.
b The Cat, leaving behind its grin, vanished.
c The Rat vanished, leaving its gin behind.
d Vanished, the Cat licked up its grin.

3a Have you pricked your finger?
b I haven't pricked it yet.
c I haven't licked it yet.
d Fingers are for flicking, toes for clicking!

4a Were you ever punished, Alice?
b Do you insist on an answer, your Majesty?
c It is none of the business of a nosey old witch!

We will take it that an utterance is a product of a bit of action by someone, and not the bit of action itself. In doing so, we will not follow scholars who have used the term *utterance* in an ambiguous way to denote both products and bits of action or acts.[1] But

let us inspect utterances a little closer, focusing first on their signal and then on their meaning.

2.1.1 Utterance signals

(In which the Queen of Hearts utters a sentence)

An utterance has an observable aspect, a **signal**, which is produced by means of speaking, writing or signing. The signal of a **spoken utterance** is phonic in substance: it is a stretch of speech sound preceded and followed by silences. Stretches of speech sound exist fleetingly as disturbances or vibrations in the air that can be heard by humans.[2] The sound of spoken utterances is produced by people in the **vocal tract**, a system of three hollow areas or cavities: the nose, the mouth and the pharynx (that is, the part of the throat above the voice box). Not all the kinds of sound that can be produced in the vocal tract, however, are (normally) used for realizing spoken utterances. These include the kinds made by Alice sucking in her breath in surprise, by the White King nervously clearing his throat, by the scared Knave's teeth chattering uncontrollably and by the Duchess's baby alternately sneezing and howling (without a moment's pause). When the baby 'grunted' something to Alice a while later, she promptly rebuked it:

> 'Don't grunt ... that's not at all a proper way of expressing yourself.' [*AIW* 86]

Speech sound clearly does not equal vocal tract sound, not even in Carrollinian dream worlds.

But let us turn to the silences flanking the signals of utterances. The nature of these silences can be easily misunderstood, as is illustrated by a particular exchange in the dream world created by Gilbert Adair beyond the needle's eye. It started with Jill - who was still in the foul mood caused by her tumble down the hill - screaming at Alice:

> 'Heard one [silence], heard them all! This new silence of yours is exactly the same - word for word, I swear - as the last!' [*TNE* 95]

And it continued with Alice protesting rather confusedly:

> 'The words I spoke - I mean, that I *didn't* speak - during this silence were quite different from those of the silence before.' [*TNE* 95]

Though sounding a bit more coherent than Alice, Jill nevertheless had it all wrong. To see why, let us dwell for a moment on the nature of the kind of silences about which Alice and Jill were at odds with each other.

At first blush, silence seems to be no more than a kind of nothingness: the absence of sound. But the **linguistic silences** --- also called **pauses** --- that precede, interrupt or follow utterances are very real things indeed in terms of what they can do. By putting linguistic silences or pauses in their speech people can 'punctuate' it, in fact, thus organizing their verbal interaction or conversation in certain ways. A silence, for example, can signal a point in a conversation at which someone who has not been speaking can get a turn at doing so. People can use silences, moreover, to 'say' or mean a variety of things. For example, by remaining silent or pausing, one can 'say' such things as 'You have me in a corner there', 'What you say is completely ridiculous', 'I won't cooperate with you', 'I refuse your request', 'I have to agree with you on that', 'I am now threatening you', 'I am now being respectful', and so on. Interestingly, in different 'languages' or cultures, the 'same' silence can mean different things. For example, if a woman kept silent in response to a question like 'Will you marry me' then she would be saying 'Yes' in Japanese, 'No' in Igbo, and 'I'm not sure' in English. So, Jill's sentiments notwithstanding, linguistic silences or pauses are

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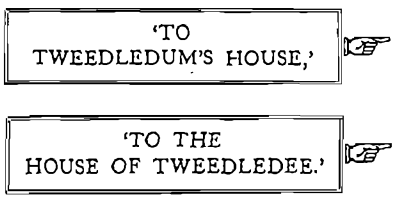
important linguistic things, a distinct kind of ingredient of the most directly given layer of linguistic reality.[3]

The signal of **written utterances** is graphic in nature, existing as marks on some kind of surface. The marks are typically deposits of some sort of stuff: ink, carbon, graphite, and so on. And the kinds of surfaces vary widely as the following curious Carrollinian finger-posts show:



As very young children learn to their frustration, not just any series of scratches or scrawls will count as a written signal. Only conventional arrangements of marks drawn from writing systems and other systems of graphic expression will pass the test.[4]

As produced in a natural way by the deaf, the signals of **signed utterances** are visible too. Also called **signs**, such utterance signals consist of hand configurations and hand movements made by signers at a place on or in a space near the upper part of the body. The signs produced in this way are generally accompanied by modulating movements of the signer's shoulders, head, lips and/or brows. The make-up of signs is governed by the conventions or rules of a sign language --- British Sign Language, American Sign Language and Chinese Sign Language being typical examples.[5] The following utterance in American Sign Language gives a rough idea of how such signs look:

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But imagine now the Cat winking conspiratorially at Alice, the Duchess clicking her fingers to summon the Cook, the Knave of Hearts clasping his hands to beg the Queen's mercy, Tweedledum angrily shaking his fist at Tweedledee. Are these characters producing signs in a Carrollinian Sign Language? No, they are not making signs but rather **gestures** of a conventional sort. Such gestures are indeed used to communicate a limited number of basic ideas, feelings, desires and so on. But they are used in a far less systematic and comprehensive way than signs are. Though some gestures have acquired a fixed meaning in certain cultures, the use of gestures is not governed by a system of conventions or rules comparable to a sign language. Unlike signs, gestures are not considered to be (the signals of) linguistic utterances and are not ingredients of linguistic reality. Nevertheless, gestures play an important role in the communicative behaviour of people, a point that will be fleshed out in par. 3.2.4 below.[6]

In considering the nature of utterance signals and in distinguishing among spoken, written and signed utterances, I have skirted various difficulties that are not relevant to our present concerns.[7] There is one distinction, however, that is important to a macroscopic picture of linguistic reality: the distinction between utterances and sentences. To see what this distinction is about, let us look at a bit of distinctly unregal behaviour in which the Queen of Hearts indulged during a curious game of croquet played in Wonderland. The game was a chaotic affair with live hedgehogs serving as

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balls and flamingoes doing duty as mallets, whilst soldiers stood on their hands and feet to make the arches. The unruly conduct of the players --- all playing at once, quarreling all the while --- was too much for the Queen, a bloodthirsty soul if ever there was one:

> '... in a very short time the Queen was in a furious passion, and went stamping about, and shouting "Off with his head!" or "Off with her head!" about once a minute.' [*AIW* 112]

Suppose that the murderous monarch shouted twenty-five times in all 'Off with his head!'. Suppose, that is, that she produced twenty-five utterances that can be represented as 'Off with his head!'. The signals of no two of these utterances would have been identical. Each would have been unique in regard to such acoustic properties as pitch, quality, intensity, and duration. This we know from experimental phonetic investigation of speech. Each of the utterances could, moreover, have referred to a different candidate for beheading. But, despite such differences, Alice and her companions would have intuitively judged the twenty-five utterances to be 'the same'.

How is one to reconcile this judgement of sameness and the existence of the differences listed above? To do just this, various linguists have adopted a distinction between utterances and sentences. And they have assumed that one and the same sentence can be realized by various utterances that differ from one another in regard to properties such as those mentioned above. Returning to the hard-hearted Queen of Hearts, these linguists would say that she uttered one and the same sentence twenty-five times and that, in doing so, she produced twenty-five unique utterances of it.[8]

Unlike utterances, **sentences** are not considered to be stretches of speech sound, strings of (written) marks on surfaces or series of hand-movements. Sentences, rather, are taken to be nonphysical entities that can be uttered or physically realized more than once. And because they are not directly given, sentences do not form part of the

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outward layer of linguistic reality. As we proceed, we will see that leading linguists hold different opinions on exactly what kind of nonphysical things sentences are and on where exactly sentences fit into linguistic reality. Some leading linguists, it will become clear in par. 5.5 below, do not consider sentences to be real components of the world of language at all.

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2.1.2 Utterance meanings

(Of a substance preserved under a bell jar in the Museum)

Faced with the Hatter's question 'Does *your* watch tell you what year it is?', Alice tried to do the normal thing: to figure out its meaning. And she succeeded in this, as is clear from her reply 'Of course not ... but that's because it stays the same year for such a long time.' The meanings that people assign to utterance signals they hear or see form a second kind of ingredient of the most directly given layer of linguistic reality. Such utterance meanings result, in other words, from something that people do; so, in terms of origin, they too are products.

But what is the nature of the meanings people assign to utterances they hear or see? Fortunately, this is not a question about the nature of meaning in general. Meaning in general, you see, is a notoriously slippery sort of stuff, as was gravely pointed out to Alice by Gilbert Adair's Grampus, an elderly whale-like creature clad in a dusty black professor's gown and mortar-board:

> 'Meaning, my dear, is a rare and precious substance... so precious that, if my opinion were asked bout it, it [i.e., meaning] should be preserved under a bell jar in the Museum - on view to the Public, Tuesdays and Fridays at sixpence a time.' [*TNE* 79]

The Grampus, of course, echoes a sentiment of many a linguist and philosopher. So let us rather focus on the nature of the meanings assigned by people to specific utterance signals, meanings so ordinary and plentiful that no museum curator would dream of putting specimens of them on display.

The **meaning** of a specific utterance is conventionally taken to be the information conveyed by its signal. A variety of factors are taken to contribute to this information. The first is the **inherent meaning** of the sentence that was uttered. (Recall in this connection the distinction drawn above between an abstract sentence and the concrete utterances resulting from its use.) The meaning of a sentence, in turn, is determined by the meanings of its individual words and by the ways in which these words are interlinked. A couple of examples will help to clarify this point.

Shouted by the Queen to the Executioner, the utterance *Off with her head!* roughly means 'I order you to behead a certain female'. Suppose, however, that in a less murderous mood the Queen, using *her* to refer to Alice, uttered 5b or 5c.

5a Off with her head!
b Off with her hair!
c Head her off!

The sentence uttered as 5b differs from the one uttered as 5a in regard to only one word. Yet, the two utterances differ considerably in meaning, as Alice - given the choice between being beheaded and being subjected to an obligatory haircut - would surely have agreed to her relief. This dramatically illustrates the contribution made by the meaning of individual words to the meaning of an utterance. And if the Queen had said 5c rather than 5a or 5b, Alice would have been even better off. For 5c roughly means that someone (the Executioner) must cause a certain female (Alice) to change the direction in which she has been moving. There is obviously a vast difference in

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meaning between 5a (or 5b for that matter) on the one hand and 5c on the other hand. And this difference is not due to the fact that whereas 5a contains the word *with*, 5c does not. Rather, this difference in meaning is due to the fact that the words *head*, *her* and *off* are interlinked in 5c in a way quite unlike that in which the words *off*, *with*, *her* and *head* are interlinked in 5a. This is to say that (the sentences uttered as) 5a and 5c differ greatly in regard to form or structure. By contrast, (the sentences uttered as) 5a and 5b have the same form or structure. The **form** or **structure of a sentence** is the way its words hang together, to oversimplify a rather complex idea, which will be explicated in some detail in par. 5.3 below.

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The meaning of the utterances that precede and/or follow an utterance is the second factor that may contribute to the meaning of this utterance. Together, such surrounding utterances form the **linguistic context** or the **co-text** of the utterance. Suppose the Queen shrieked *Off with her head!* immediately after she had said 6.

6 I can't stand Alice's stupid questions any longer.

Uttered in the context of 6, *Off with her head!* conveys information differing in an important way from the information it conveys when spoken immediately after 7.

7 I can't eat the Cook's awful food any longer.

Clearly, the information conveyed by *her* differs significantly between the two contexts.

The third factor contributing to the meaning of an utterance comprises the features of the **non-linguistic context** in which it is produced. These include the time when, the place where, and the occasion on which the utterance is produced, the identity of the speaker and the addressee, the knowledge shared by them about the world, including

one another, and so on. Suppose, for example, the Executioner knew the Queen to be a rash person given to overstatement. He would not then understand the Queen's utterance of *Off with her head!* as ordering him to literally cut off someone's head. He would simply take it as an exaggerated expression of irritation by a person in a foul mood. By contrast, if *Off with her head!* were uttered by a cold-blooded monarch with a reputation for having dissident subjects beheaded as a matter of course, this utterance would have the Executioner sharpening his axe.

This brings us to the fourth factor contributing to the meaning of an utterance: the nature of the **speech act** performed - that is, the nature of what is done linguistically - by the person producing the utterance. For example, by producing an utterance, someone may make a statement, ask a question, express a request, give an order, make a promise, express an apology, utter a blessing or a curse, and so on. Suppose that *Off with her head!* were not produced by the enraged Queen. Suppose, rather, that the Executioner uttered it and that in doing so he said it with a rising intonation, i.e. with his voice going up toward the end. In writing, conventionally, an utterance of this kind is represented as follows:

8 *Off with her head?*

Spoken with a rising intonation, the utterance clearly does not mean 'I order you to behead a certain female'. Rather, the Executioner could be asking a question which means roughly 'Am I correct in understanding that you wish a certain female to be beheaded by me?'. Or, the Executioner could be making a statement conveying the information 'You must be mad/joking/..... to wish a certain female to be beheaded by me'. The meaning of an utterance, clearly, depends in part on the nature of the speech act performed by the person producing it.

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The meaning of an utterance, then, is the information conveyed by it. When we consider the purposes of language behaviour in par. 3.2.1 below, it will become clear that this information may belong to different kinds. For now, it is sufficient to note that the nature of the meaning of specific utterances is much less mysterious than the nature of meaning in general. Which, of course, is not to say that it will be easy to state what every specific utterance means. The Grampus, however, pushes the point a bit too far when he laments that 'the best meanings ca'n't ever be written down'.[9] [*TNE* 80]

2.2 Linguistic judgements

(Of an old Frog's English)

Recall that Alice judged The Hatter's utterance 'Which is just the case with *mine*' 'to have no sort of meaning in it' though 'it was certainly English'. Such judgements form a second basic kind of ingredient of the crust of linguistic reality. But what, in essence, are judgements of this sort? To get a grip on this question, we have to look at more examples, calling them 'linguistic judgements' from now on. So let us go back to the utterances in (1)-(4) above. A speaker-hearer of English may typically judge, for example, that (1a) is 'normal English'; that (1b) 'says something funny' but is 'good English' too; that (1c) and (1d) are 'not (good) English'. Turning to utterances (2a)-(2d), such a person may judge that (2a) and (2b) 'look rather different' but 'mean the same thing'; that (2a) and (2b) mean that the ('left-behind') grin cannot be that of anything/one else but the Cat; that (2c) 'looks a lot like' (2a) but 'has a different meaning'; and that (2d) 'makes no sense at all'. As for the utterances (3a)-(3d), such a person may judge that (3b) is a 'proper reply' to question (3a), but that (3c) isn't; that (3d), despite being 'good English', 'is not an (appropriate) answer' to (3a); and that (3d) is 'loony' as a response to (3a). Which brings us to (4a)-(4c): as a reply to question (4a), question (4b) may well be judged to have 'the right, respectful tone';

utterance (4c), by contrast, is likely to be considered 'not the proper way for a young girl to talk to a queen'.

Linguistic judgements such as the above express opinions that people have about the ways in which utterances of their language are formed, understood or used. Many such judgements simply say that particular utterances are considered to be good or bad, identical or distinct, similar or different and so on in regard to form, meaning or use. This characterization of linguistic judgements, obviously, requires some fleshing out. So let us reflect for a moment on the following questions: What are linguistic judgements rooted in? What makes judgements linguistic?

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As for the first question, people normally cannot give the real grounds for linguistic judgements such as the ones considered above. For example, they are normally unable to say why they judge an utterance such as *The gnat sighed existence* to be 'bad' or 'not English'. People make such linguistic judgements in a wink without recourse to reasoning or without using their senses. Judgements whose bases cannot be given are considered to express **intuitions**. Linguistic judgements of the sort considered above have accordingly also been called **linguistic intuitions**.[10]

To call a particular linguistic judgement 'intuitive' is not to say that it is necessarily correct: the linguistic intuitions expressed by such judgements are not by their very nature infallible. Nor are linguistic intuitions invariable: not all the people speaking the same language will have the same intuitions about 'the same' utterances. This holds even for some inhabitants of Looking-Glass Country, where Alice judged an old Frog's utterances to be in less then good order --- much to the dismay of the Frog, who insisted:

'I speaks English, doesn't I?' [*TLG* 328]

On different occasions, moreover, one and the same person may make conflicting judgements about 'the same' utterance, first judging it, for example, to be 'bad English' and later to be 'good English'. Here, we are not yet ready to explore the reasons why intuitive linguistic judgements can be false or why they can vary.[11]

What, then, makes the intuitive judgements which we have been looking at *linguistic* judgements? Alice often judged things said to her by her companions hard to believe, difficult to fathom, nonsensical, and the like. Consider, in this connection, the following utterances spoken by the White Queen, the White King and the Unicorn, respectively.

9a I'm just one hundred and one, five months and a day. [*TLG* 251]

b To be able to see Nobody! And at that distance too. Why it's as much as I can do to see real people by this light! [*TLG* 279]

c Hand it [= a Looking-Glass cake] round first, and cut it afterwards. [*TLG* 290]

Alice judged 9a quite hard to believe, 9b difficult to fathom, and 9c nonsensical. There are linguists, however, who will not see these judgements by Alice as *linguistic* judgements. In support of this view, they will argue that linguistic judgements have to be judgements about linguistic properties of utterances. And that neither the credibility, nor the truth nor the sensicality of what anyone says represents a linguistic property of the utterances in question.

Which brings us to a general point: not every judgement made intuitively in response to a given utterance represents a *linguistic* judgement about the utterance. Whether judgements about utterances do or do not constitute linguistic judgements about these

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utterances depends on certain assumptions made by linguists. These include assumptions about what are and what are not linguistic properties of utterances. These assumptions, in turn, reflect beliefs about the nature of the entities --- such as language and languages --- that form part of deeper layers of linguistic reality. Since linguists disagree about these beliefs, they also disagree about what the linguistic properties of utterances are. For example, many linguists agree that 'being good / being well-formed', 'sounding different from', 'rhyming with', 'differing in meaning from', 'having the same meaning as', 'having more than one meaning' are indeed linguistic properties of utterances. But there is disagreement among linguists about such properties as 'being (necessarily) true', 'making sense' and so on.[12]

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2.3 Texts and discourses

(In which the Sad Hatter acquires a faceless grin)

Linguistic utterances and linguistic judgements, then, are the basic ingredients of the outer layer of linguistic reality. But are they the only ingredients of this layer? To go into this question a little, let's consider the following four utterances:

10a The Cat vanished, leaving its grin behind.

b In Dreamland, you see, grins can fade but not disappear.

c This suited the Sad Hatter, who had long ago forgotten how to smile.

d He deftly sewed the faceless grin on to his hat, muttering absent-mindedly, 'Down with grinning cats, up with grinning hats'.

Taken together, these four utterances differ in an important way from, say, the four listed as 2a-d. The four utterances 10a-d are linked to each other in such a way that

any reader of them is likely to infer that their producer intends them to form a cohesive sequence or, as it is conventionally called, a **text**. Taken together, these utterances may plausibly be considered a fragment of a text intended by Lewis Carroll to be another Alice story (one never published, of course). The cohesiveness of this sequence of utterances is reflected, for example, by the fact that, to grasp the meaning of *This* in 10c, one has to 'go back' to the meaning of 10b and that, to grasp the meaning of *he* in 10d, one has to 'go back' to the meaning of *the Sad Hatter* in 10c.

The four utterances 2a-d, by contrast, are not linked to each other in a similarly cohesive way. In the absence of such cohesion, these utterances consequently do not form a text. As a collection, 2a-d does not represent a whole that is more than the sum of the individual utterances.

The general point is that, along with utterances and judgements, the outer layer of linguistic reality also contains texts. Made up of utterances, however, texts are compound or nonbasic ingredients of this layer. The utterances making up a text may of course be either written or spoken ones. To distinguish terminologically between spoken texts and written texts, linguists often refer to spoken ones as **discourses**.[13]

It must be stressed, in conclusion, that the cohesion linking the individual utterances of a text (or a discourse) is not something physical. For example, utterances 10c and 10d are linked by cohesion not because they happen to be neighbours in space or time. These two utterances are linked cohesively, one with the other, because the sentences underlying them are related by the linguistic link between *Sad Hatter* and *he*. So one can say that texts (and discourses) are not merely sequences of utterances but are also, ultimately, collections of sentences.[14]

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2.4 Crusthood

(On when not to trust one's eyes or ears)

And so we have passed through the crust of linguistic reality, its surface or outermost layer. The basic ingredients of the layer of language products, we have seen, are utterances - characterized by a signal and a meaning - and intuitive linguistic judgements. In addition, the outward layer contains cohesive collections of utterances, texts and discourses to be specific. You may have been wondering why this layer has been pictured as the 'outward' or 'surface' layer. Not because its ingredients are observable: utterance meanings and intuitive judgements are not. The answer is rather that this is the most directly given layer in the sense that one can get to its ingredients without having first to penetrate some other layer of linguistic entities.

It has to be borne in mind, though, that to be able to identify the utterances of a particular language as distinct from nonlinguistic noises, ink scrawls or hand movements, one has to know the language. This point is illustrated in a rather striking way by an experience of one Reverend Farrar who lived nearly a century ago. Not knowing the language of the Yamparico all that well, he found it quite difficult to distinguish their speech from 'the growling of a dog'.[15] This goes to show that even the most directly observable kind of ingredients of the crust of linguistic reality cannot be recognized for what they are by just anyone who has ears to hear and eyes to see.

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3 Its Behavioural Belt

> *'Alice thought to herself "Then there's no use in speaking." The voices didn't join in, this time, as she hadn't spoken, but, to her surprise, they all thought in chorus ... "Better say nothing at all. Language is worth a thousand pounds a word!"' [TLG 217]*

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In Carrollinian worlds, all sorts of creatures have the remarkable knack of appearing, as it were, from nowhere. For instance, soon after Alice had entered Needle's Eye World, she witnessed how kittens and puppies, followed by cats and dogs, fell out of the sky:

> 'Hundreds of cats and dogs .... were pouring down as far as she could see. Once they landed, they would all make a rush for lower ground, gathering there in huddles --- "or *puddles*, I suppose one ought to say" --- ....' [*TNE* 41]

In Needle's Eye World, one could accordingly say *It rained cats and dogs*, and mean it literally. But even in this curious place, one would have to be a lot madder than the Hatter to say *It rained linguistic utterances and intuitive judgements* and to mean that literally. For here, as in the real world of language, linguistic utterances and judgements cannot come from nowhere. Nor have they 'just been there' all the time, patiently waiting to be pressed into service. In both worlds, these linguistic things are created by someone acting in a certain way. This means that linguistic reality must have a second, deeper, layer: a layer consisting of what people do so as to produce utterances, to assign meanings to utterances --- 'comprehend' them (as we will say from now on) --- or to judge utterances intuitively. The actions they perform in producing, comprehending or intuitively judging utterances make up people's **language behaviour** (also called **linguistic** or **verbal behaviour**). And the language behaviour of people forms a second layer of linguistic reality, the **layer of language behaviour**.

But what is the general nature of the actions that make up language behaviour? What are the more salient properties of language behaviour? And what kinds of language behaviour are to be found in the second layer of linguistic reality? These are the general questions which we will turn to next. In so doing, we will refer to someone's producing, comprehending or intuitively judging an utterance as a **bit** or (more formally) an **act of language behaviour**.

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3.1 General nature

(In which Alice insults the Queen in silence)

The inhabitants of the various Carrollinian worlds turn out to be a quite vociferous lot: they often talk, converse, squabble, shout, cry and even mutter in a strikingly energetic way, using language with great gusto. Indeed, if one were to go by their actions, it would be tempting to conclude that language behaviour is a highly observable form of action. But this conclusion would be wrong. What, for example, can be seen or heard of the action involved in someone's comprehending the (Queen's) utterance *Off with her head!* or the utterance '*Sentence first - verdict afterwards*'. Likewise, what can be observed of the action involved in someone's intuitively judging the latter utterance to be good English, despite its saying something funny? What, for that matter, can be seen or heard of the action involved in the oral production of these two utterances? Apart from opening and closing mouths and moving lips, very little indeed. What can be heard represents the utterances --- that is, the products of the Queen's action --- and not the action itself. When people behave linguistically, what on the whole is observable is the product of their behaviour, not the action that makes up the behaviour. Language behaviour exists for most part as **unobservable action**.[1]

A piece of action, then, need not be observable to qualify as a bit of language behaviour. But can a piece of action manifest language behaviour if it does not feature

in the production, comprehension or intuitive judging of an observable utterance? To see the point of this question, consider the following - a scene, which, incidentally, does not form part of any Alice adventure:

> 'Alice was still quite upset by the Queen's unregal behaviour. "If I ever met her again", Alice thought, "I would say to her *A queen shouldn't behave like a witch*. And", Alice thought, "should the Queen turn purple again and scream in reply *How dare you call me a witch?! Off with her head*!, I would calmly say to her *Who's afraid of you? You're nothing but a silly old card*!"'

The italicized strings of words were not spoken aloud by Alice or the Queen. These strings, accordingly, were not observable. Yet, they have all the other, nonphysical, properties of observable utterances: they are 'good English' in regard to form; they have a clear, nonanomalous meaning; they are being used appropriately, and so on. What is more, in her mind, Alice could even have 'gone through the motions' of saying them, practising silently how to get the tone, emphases, pitches and so on of the first, fourth and fifth italicized strings just right for the particular occasion. Through her 'mind's ear', moreover, she could have heard the enraged Queen shrilly screaming the second and third italicized strings. This fictitious little Carrollinian scene serves to illustrate a general point: utterances can be produced in a **mental medium** as well as in a physical medium. As a matter of fact, people are all the time conducting conversations, arguments and so on 'in their heads', producing, comprehending and intuitively judging unobservable utterances in the process. The acts involved in this represent a kind of language behaviour called **internal** or **silent speech** by some.[2] The idea of an unobservable product of language behaviour is not a new one, of course: the meanings yielded by the comprehension of observable utterances are by their very nature unobservable entities in any event.

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Utterances produced 'in the mind' should not be confused with thoughts or with strings of words which are being used for representing thoughts. To see this, consider the following passage from *Through the Looking-Glass* (p.197).

> '"But oh!" thought Alice, suddenly jumping up, "if I don't make haste, I shall have to go back through the Looking-glass, before I've seen what the rest of the house is like. Let's have a look at the garden first!"'

The strings of words enclosed --- by Carroll --- in the two pairs of double inverted commas are being used --- by him, as the author --- to represent thoughts of Alice's. Neither these thoughts nor these strings of words are observable utterances produced by Alice. And not only such thoughts but also such strings of words are distinct from unobservable utterances produced in internal speech, utterances such as the italicized ones exchanged in the apocryphal altercation between Alice and the Queen. The italicized utterances, clearly, are not strings of words whose function it is to represent thoughts of Alice's or the Queen's.

The idea of 'silent speech' and that of 'strings of words being used for representing thoughts' are relatively simple ones in comparison with the idea of 'voices thinking in chorus'. This is a view which Alice is sure to support. Travelling on a strange train in Looking Glass Country, she discovered to her surprise that the 'voices' of the other passengers alternately spoke and 'thought' together. These 'voices', for example, 'thought in chorus...: "Better say nothing at all. Language is worth a thousand pounds a word." Alice --- and perhaps even Lewis Carroll too --- found it hard to come to grips with this kind of 'thinking':

> 'I hope you understand what *thinking in chorus* means --- for I must confess I don't.' [*TLG* 217]

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How is it possible for a group of people to 'think together' and to collectively 'utter' their thoughts without saying anything? And: How could anybody outside the group 'hear' things which haven't been said by the group? These are likely to have been among the questions that Alice had to grapple with. Whatever 'thinking in chorus' might involve, it is an activity confined to dream worlds, fortunately. Which will be our excuse for leaving to Alice the task of unravelling its mysterious nature.

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3.2 Specific properties

(*Of a twin-faced phenomenon*)

3.2.1 Purposiveness

(*In which there are Porpoises aplenty*)

Language behaviour, then, involves the production, comprehension and intuitive judging of utterances. But should every act by means of which an utterance is produced be considered a bit of language behaviour? Suppose that, for short spells, the Mad Hatter slipped into a really 'deep' form of madness. Suppose moreover that during such spells, The Hatter, apparently oblivious of his surroundings, produced utterances such as the following:

> The March Mouse has been of different colours in terms of black and white and I do not intend that futuramas of Alice's fixtures will ever be in the Hare's life again because I believe that all known Queens that would have its effect on me even the chemical reaction of tea acids are in the process of combustronability are blue to me.[3]

For what purpose are utterances such as these produced by seriously deranged people? Linguists would be hard-pressed to come up with a non-arbitrary answer. Some

psychiatrists have speculated that certain schizophrenics produce such utterances for cutting themselves off from society in order to be unique. But many linguists would claim that this is not a normal purpose of language behaviour. This would mean that by producing utterances of the sort in question, a deranged person would, strictly speaking, not be behaving linguistically. (Normal) language behaviour is a kind of **purposive or intentional action** by means of which the language user tries to achieve one or more conventional goals. What this means, then, is that we have pinned down a first specific property of language behaviour: **purposiveness.**[4]

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In being purposeful, the language behaviour of normal people resembles the 'travelling behaviour' of the whiting to which Alice was introduced by The Mock Turtle:

> '"No wise fish would go anywhere without a porpoise" [The Mock Turtle said].
> "Would't it, really?" said Alice, in a tone of great surprise.
> "Of course not," said the Mock Turtle.
> "Why, if a fish came to *me*, and told me he was going a journey, I should say 'With what porpoise?'"
> "Don't you mean 'purpose'?" said Alice.
> "I mean what I say," the Mock Turtle replied in an offended tone'. [*AIW* 137]

Which brings us inevitably to the question: What are the 'porpoises' of language behaviour?

Like people living in our ordinary world, Carrollinian characters in general are highly versatile users of language. Indeed, their verbal actions strikingly illustrate the diversity of the purposes that bits of language behaviour can have. So let us examine some of the bits of linguistic action in which Alice and her companions engaged.

To begin with, consider 1:

1 *'I can't explain myself, I'm afraid, Sir,* said Alice, *because I'm not myself, you see'.* [*AIW* 67]

The italicized utterance above is one which Alice used for conveying something --- an idea or a belief --- to a companion, the Caterpillar. Alice's piece of action illustrates what has been called the **representational purpose** of language behaviour: people produce utterances in order to convey factual information, report or record events, describe things and so on. Incidentally, the fact that Alice's utterance conveyed an idea which made little sense to the Caterpillar does not mean that Alice did not use her utterance for the purpose of representation.

The utterance italicized in 2, however, was used by Alice for a different purpose:

2 *'Oh, you wicked little thing!* cried Alice, catching up the kitten, and giving it a little kiss to make it understand it was in disgrace'. [*TLG* 176]

This utterance Alice did not use for conveying an idea or a belief to some other language user. Rather, by producing this utterance Alice expressed a feeling or emotion which she also did by kissing the kitten. Alice's uttering of the italicized string of words, accordingly, exemplifies what has been called the **expressive** or **emotive purpose** of language behaviour.

But what was Alice attempting to do by producing the utterance italicized in 3?

3 *'Here are the Red King and the Red Queen,* Alice said (in a whisper, for fear of frightening them), *and there are the White King and the White Queen sitting on the edge of the shovel - and here are two Castles walking arm in arm - I don't think they can hear me ...'* [*TLG* 187]

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Clearly, she was talking to herself. But for what purpose? Neither to convey a message to herself nor to express a feeling. The purpose of this bit of language behaviour by Alice is, rather, to help her clear her mind or to get a better mental picture of reality. The bit of language behaviour, thus, has what may be called a **cognitive** or an **intellectual purpose**. Talking to oneself, incidentally, is not to be confused with whatever it is that 'voices' do when they 'think in chorus'.

The utterances italicized in 4 were addressed by a somewhat upset Alice to herself as well:

4 *'You ought to be ashamed of yourself,* said Alice, *a great girl like you,* (she might well say this), *to go on crying in this way! Stop this moment, I tell you!'* [*AIW* 36]

But was Alice trying to clear her mind or to aid her thinking by uttering the strings of words in question? It does not seem to be the case. This utterance appears to have been produced for a different purpose: to enable Alice to get a grip on her feelings and to influence her nonlanguage behaviour --- to stem the flow of her tears. In producing this utterance, accordingly, Alice illustrates the so-called **regulatory purpose** of language behaviour. The same purpose is differently illustrated by the italicized utterances in 5.

5 'And [as Alice and the Queen were running] the Queen seemed to guess her thoughts, for she cried *Faster! Don't try to talk!'*. [*TLG.*209]

As the Queen's utterances show, people may also act linguistically in an attempt to directly influence or control other people's behaviour. True, Alice was already panting from running, and could not run much faster; that, however, does not change the purpose for which the Queen uttered the strings italicized in 5.

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One and the same bit of language behaviour can have more than one purpose, as is evidenced by the utterances italicized in 6.

6 *'In that case,* said the Dodo solemnly, rising to its feet, *I move that the meeting adjourn, for the immediate adoption of more energetic remedies -'.* [*AIW* 47]

Obviously, by uttering the italicized strings of words, the Dodo wished to influence the behaviour of other Wonderlanders: getting them to make an end to the meeting. But these utterances were used by the Dodo for another purpose as well: to reveal things about its personality (or its 'animality', if you wish). By speaking in a solemn tone of voice and by preferring long, learned words --- to simple, ordinary ones --- the Dodo was using language to reveal to his audience that he was a serious, and an intellectual, individual. That he succeeded in this is clear from the fact that he was brusquely told by the irritated Eaglet to 'Speak English!'. Through their language behaviour, people can indeed deliberately reveal various aspects of their personal identity: their ethnic origin, social class, sex, age, occupation, and so on. In this sense, then, language behaviour can serve a **personative purpose** as well.

Which brings us to the utterance italicized in 7.

7 *'Good-bye, till we meet again!* she [= Alice] said as cheerfully as she could [to Humpty Dumpty]'. [*TLG* 275]

The italicized utterance was not produced by Alice for any of the purposes considered above. Rather, she used it for a purpose that has been called 'social lubrication': oiling social relations, avoiding interpersonal friction, and so on. Social lubrication is an

instance of the **interactional** or **social purpose** of language behaviour. This purpose, in general terms, is keyed to establishing and maintaining (good) social relations.

Let us turn now to the utterance italicized in 8:

8 *'You're my prisoner!* the Knight cried, as he tumbled off his horse'. [*TLG* 294]

On the face of it, this utterance looks like the one in 5 above: both seem to be aimed at regulating Alice's behaviour. In fact, however, the two utterances differ significantly in purpose. The utterance italicized in 8 is one which the Knight produced in order to do something to Alice in a practical way: to take away her freedom. And if the Knight had the right authority and acted in the proper way, his mere crying *You're my prisoner!* would indeed have taken Alice's freedom away from her. (Fortunately for Alice, the Knight's tumble from his horse stripped him of the required authority.) Bits of language behaviour with the aid of which people do practical things or make practical things happen have an **instrumental purpose**. Christening babies, sentencing criminals (or luckless Wonderlanders), knighting subjects, pronouncing a man and a woman to be husband and wife - all these are further typical examples of what people can do in a practical way by producing utterances.

But let us move on to a purpose of language behaviour that is quite different from the above ones, the **aesthetic purpose**. People can behave linguistically in order to create things they or other people experience as pleasing in some sense. The verses prefacing *Alice in Wonderland* and those terminating *Through the Looking-Glass* are products of just such language behaviour by Lewis Carroll. The latter verses close as follows ('they' referring to children):

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9 *'In a Wonderland they lie,*
Dreaming as the days go by,
Dreaming as the summers die:

Ever drifting down the stream -
Lingering in the golden gleam -
Life, what is it but a dream?'

[*TLG* 345]

Akin to the aesthetic purpose of language behaviour, illustrated by 9, is its **ludic purpose**: people play games and have fun by behaving linguistically in certain ways. For example, to tell how Alice, to her own 'amazement', had got lost in a maze, Gilbert Adair playfully produced the following 'amazing' utterance:

10 Poor Alice! For if she'd only had a bird's-eye-view of the Maze,
she would have realised that by
turning right and right again
and yet again
three times in all,
then turning left
four times in a row, she would find
herself at the centre.

[*TNE* 112]

Producing utterances that are aesthetically pleasing or playful reflects, amongst other things, the use of one's imagination. The aesthetic and ludic purposes of language behaviour have, accordingly, been considered to be special cases of its **imaginative purpose**.

As illustrated by the opening lines of another Lewis Carroll poem, *Jabberwocky*, language behaviour has more purposes than those considered above:

11 *'T'was brillig, and the slithy toves*
Did gyre and gimble in the wabe:'

[*TLG* 270]

An expert at explaining 'all the poems that ever were invented --- and a good many that haven't been invented just yet', Humpty Dumpty told Alice the following about 'toves': being something like badgers, something like lizards and something like corkscrews, they make their nests under sundials and live on cheese.[5] The coining of the word *toves* illustrates how people can use language for the purpose of **naming** things --- real or fictitious --- so as to be able to think and talk about them.

Consider now Alice's account of the taste of a strange fluid: the fluid that came from a bottle labelled 'DRINK ME', and that made her shrink to only ten inches high:

> '... it had in fact a sort of mixed flavour of cherry-tart, custard, pine-apple, roast Turkey, toffy and hot buttered toast ...'
>
> [*AIW* 31]

The words *cherry-tart*, *custard* and so on in this utterance of Alice's may seem to name qualities of the stuff she drank. But they don't really. Alice, in producing this utterance, was not trying to make true claims or factual statements about objectively identifiable qualities of a certain liquid. Indeed, it does not even make sense to ask whether the strange fluid really tasted like cherry-tart and so on. Rather, Alice was using the words *cherry tart, custard, pine-apple* etc. for the purpose of indicating to others certain (taste) sensations that she experienced when drinking the strange fluid. And she used these words in an attempt to trigger in others the same or similar sensations. That is, Alice used these words to interact with others - potential listeners or readers - at the level of the senses. Language, accordingly, is used here for a purpose that may be called **sensory interaction**.

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Various interesting purposes of language behaviour have not been surveyed above: the purpose of coordinating people's movements to a common rhythm as they work or play together, of making people laugh, of injuring people spiritually, of robbing people of intangible possessions or qualities such as their power, their dignity or their very humanity. The list would be easy to extend. But doing so is unnecessary, since the main point should be clear: language behaviour is a species of multipurposive action.[6]

Before we proceed to a second specific property of language behaviour, note that the terms 'communication' and 'communicative' have not been used above for characterizing any of the purposes of such behaviour. At first blush, perhaps, this seems quite odd. Scholars of many different kinds, after all, believe that language is used for the purpose of 'communication' and that language behaviour is accordingly a kind of 'communicative' behaviour. But what are 'communication' and 'communicative' supposed to mean in this context? There lies the rub. These terms have been used in various senses, a practice that has caused a lot of confusion. In one of the narrowest senses, the term **communication** has been used to mean 'the intentional transmission of factual information by means of some established signalling-system'. The representational purpose of language behaviour would be 'communicative' in this narrow sense. In one of its widest senses, by contrast, 'communication' has been commonly used to mean 'the conveying of any kind of information'. In this elastic sense, the term applies to many of the purposes that have been ascribed to language behaviour. There is obviously a wide diversity of kinds of information that can be conveyed by utterances, a point which we will take up again shortly. It is because of the confusion that so easily arises from the variable use of 'communication' and 'communicative' that these terms have been avoided above.[7]

Recall that in par. 2.2 the meaning of an utterance was characterized as the information conveyed by its signal. From our review of the purposes of language behaviour it is

clear that utterances can state or otherwise convey various kinds of information: information about some factual state of affairs, about the speaker's feelings or emotions, about the speaker's social intentions, inclinations, relations, about the kind of person the speaker is, and so on. Extending this line of thinking in a natural way, many scholars distinguish among various kinds of meaning too, including factual (or descriptive) meaning, expressive (or emotive) meaning, social (or phatic) meaning, and so on.[8]

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3.2.2 Cooperativeness

(In which Alice converses with a cantankerous Caterpillar)

As is also evidenced by the Alice stories, much of language behaviour takes place in the so-called primordial or canonical setting of face-to-face conversation between two or more people. In this setting, language behaviour exhibits a second specific property: it is **cooperative**. But what does it mean to say that language behaviour is a kind of cooperative action? Basically two things, both of which can be characterized with reference to conversations between Alice and certain Wonderlanders.

In the course of the Mad Teaparty, a conversation took place about three little sisters who, according to the Dormouse, had lived at the bottom of a treacle (i.e., molasses) well. Consider the following fragment of this conversation:

> 'Why did they live at the bottom of a well?' [Alice asked]
>
> The Dormouse again took a minute or two to think about it, and then said, "It was a treacle-well."
>
> "There's no such thing!" Alice was beginning very angrily, but the Hatter and the March Hare went "Sh! Sh!" and the Dormouse sulkily remarked, "If you can't be civil, you'd better finish the story for yourself."

"No, please go on!" Alice said very humbly. "I won't interrupt you again. I dare say there may be *one*."

"One, indeed!" said the Dormouse indignantly. However, he consented to go on. "And so these three little sisters - they were learning to draw, you know -"

"What did they draw?" said Alice, quite forgetting her promise.

"Treacle," said the Dormouse, without considering at all this time.

"I want a clean cup," interrupted the Hatter: "let's all move one place on." [*AIW* 101-102]

This bit of conversation is interesting to us because of the poor language behaviour by Alice and the Hatter, who interrupted the Dormouse no less than three times. In not allowing the Dormouse to speak uninterruptedly, they acted in a distinctly uncooperative way. In a conversational setting, normal language behaviour is cooperative in that the participants neither all speak at once nor elbow their way into the discourse, rudely grabbing turns to speak 'anytime they like'. Rather, the participants take turns to speak in accordance with certain rules or conventions. So here is a first way in which language behaviour is cooperative: people generally obey **turn-allocation rules**, acting on signals given by the speaker to the effect either that his turn is over or, on the contrary, that he wishes to keep the floor. These cues --- called **turn-yielding cues** --- include rising or falling pitch at the end of a clause, pausing, 'drawling' of clause-final syllables and such nonverbal means as gazing and gesturing. And, in general, when participants do break any of the rules, they --- unlike Alice or the Hatter --- are not acting out of social hamhandedness, rudeness or madness; rather, they break the rule in a deliberate way to achieve specific conversational ends. These ends include steering the conversation in a different direction, bringing the speaker back to the matter in hand, scoring debating points, taking the wind completely out of the speaker's sails, and so on. Incidentally, the general rule broken by Alice and the Hatter reads roughly as follows:

> 'Don't butt in on a conversation if the present speaker has not signalled the end of his/her turn.'[9]

Which brings us to a second way in which language behaviour is cooperative in a conversational setting: having been granted a turn to speak, a participant must say the right kind of thing, and must say it in the right way. But what do 'the right kind of thing' and 'the right way' mean? Put differently: what are the standards of behaviour to which people must conform in this regard?

Much of the humour in the Alice stories is rooted in Dreamworlders' (sometimes studied) inability either to say or ask the right thing, or to do so in the right way. The conversation between Alice and the blue hookah-smoking Caterpillar, who turned out to be a particularly brusque character, is delightfully instructive in this regard.[10] In response to the Caterpillar's question

> 'Who are *You*?'

Alice replied rather shyly:

> 'I - I hardly know, Sir, just at present - at least I know who I *was* when I got up this morning, but I think I must have been changed several times since then.' [*AIW* 38]

As a reply to a simple request for identification, Alice's response is wrong in at least three ways: Firstly: it does not give the relevant information, thereby violating the rule of language behaviour known as the Maxim of Relation. Secondly: it gives too much information (of the wrong sort), thereby violating the Maxim of Quantity. Thirdly: what information it does give it gives in a confusing, obscuring way, thereby

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violating the Maxim of Manner. Predictably, the Caterpillar was unhappy with Alice's reply. And so she had to face his stern demand:

'What do you mean by that? Explain yourself!'

To which Alice responded:

'I can't explain *myself*, I'm afraid, Sir, because I am not myself, you see.'

This response of Alice's was equally unsatisfactory since it too did not contain the required, relevant information. And on top of that it was obscure, as is clear from the Caterpillar's terse rejoinder:

'I don't see.'

The point, then, is that in regard to what they say and how they say it, the participants in a conversation should behave cooperatively. In a nutshell, their language behaviour should conform to what is called the **Cooperative Principle**:

'Make your conversational contribution such as is required, at the stage at which it occurs, by the accepted purpose or direction of the talk exchange in which you are engaged'.[11]

3.2.3 Space-time anchoredness

(*In which the Hitherians declare war on the Thitherians*)

The above exchange between Alice and the Caterpillar illustrates also a third specific property of language behaviour occurring in a conversational setting: it is **anchored in**

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space and time. Or, in other words, it has a 'spatio-temporal context'. Such a context is made up of the following (at least): a number of participants in the changing roles of speaker and listener or addressee; a real or imaginary scene shared by the participants through their senses --- hearing, vision and others --- and their memory; the (shifting) places at which the participants find themselves within this scene; the point in time at which each utterance is produced; other utterances, whether produced before or after that point in time. Many utterances are anchored in their spatio-temporal contexts in an explicit way with the aid of specific words or expressions. Anchoring an utterance spatio-temporally is called **deixis** and the anchoring words and expressions are known as **deictic expressions**. Expressions like *you* and *me*, for example, establish **participant** or **person deixis**; *this* and *that* or *here* and *there*, for example, establish **place deixis**; and *at present* and *this morning* or *now* and *then*, for example, establish **time deixis**. In the Caterpillar's question *What do you mean by that?*, *that* refers to the preceding utterance by Alice, thereby establishing **discourse deixis**.

Used uncooperatively, deictic expressions cause confusion, disorientation and frustration. This Alice experienced at first hand when, having got lost in Gilbert Adair's maze, she found at certain forks signposts reading as follows:

12a 'THIS WAY? OR THAT WAY? (with two arrows pointing in opposite directions)

b 'HITHER' (with an arrow pointing in one direction) and

c 'THITHER' (with an arrow pointing in the other)

d 'YOU ARE HERE' (and underneath in brackets) 'ELSEWHERE 500 YARDS' [*TNE* 105-107]

And of course, failing as they did to refer to even one place Alice actually knew, these deictic expressions did not help her one bit to get out of the maze. Instead, they left her wondering and daydreaming:

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'But would I prefer to go Hither or Thither? .... Now Hither does sound a little closer than Thither and even if I don't know what it is, it might be an advantage to get there sooner, you know. On the other hand, Thither sounds more interesting somehow, and perhaps no human being has ever set foot on it before. Then I'd become a sort of explorer .....' [*TNE* 106]

Having dreamt further of being crowned Queen Alice the First, of ruling the Thitherians for thirty-three years, and of declaring war on the Hitherians, Alice finally realized that 'all this nonsense I'm talking isn't going to get me anywhere at all.' Her woes, of course, were caused by the uncooperative language behaviour of whoever had put up the confusing signs: deictic expressions of place cannot be used effectively in the absence of a shared spatial frame of reference.[12]

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3.2.4 Nonlinguistic embeddedness

(*Of the growling of an angry Egg*)

The setting in which a bit of conversation takes place normally comprises a further element: acts of a nonlinguistic sort performed by the participants in the conversation. Consider in this connection some of the utterances which were produced by Wonderlanders during the trial of the Knave of Hearts, who stood accused of having stolen the tarts made by the Queen of Hearts:

13a "I'm a poor man, your Majesty." [p.149]

b "I'd rather finish my tea." [p.150]

c "Well, if I must [cross-examine the witness], I must." [p.151]

d "Consider your verdict." [p.156]

e "Oh, I beg your pardon!" [p.153]

f "*Un*important, your Majesty means of course." [p.155]

g "That's the most important piece of evidence we've heard yet." [p.159]

h "Do I look like it [i.e., being able to swim]?" [p.159]

i "It's a pun!" [p.160]

j "*Off with her head!*" [p.161]

(All the above page references are to *AIW*.)

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The uttering of 13a-j was intertwined with bits of nonlinguistic behaviour conveying information about the feelings, thoughts and desires of the various speakers. These bits of nonlinguistic behaviour are described by Carroll in 14a-j, respectively. The dots "....." mark the places where the utterances 13a-j slot into 14a-j, respectively.

14a 'The miserable Hatter dropped his teacup and bread-and-butter, and went down on one knee. "....."' [p.149]

b '"....", said the Hatter, with an anxious look at the Queen, who was reading the list of singers.' [p.150]

c '"....", the King said with a melancholy air...'. [p.151]

d 'The King turned pale, and shut his notebook hastily. ".....", he said to the jury, in a low trembling voice.' [p.156]

e '"....." she exclaimed in a tone of great dismay...' [p.153]

f '"....", he [= the White Rabbit] said in a very respectful tone, but frowning and making faces at him [= the King] as he spoke.' [p.155]

g '"....", said the King, rubbing his hands;' [p.159]

h 'The Knave shook his head sadly. "....." he said.' [p.159]

i '"....." the King added in an angry tone, and everybody laughed.' [p.160]

j '"....." the Queen [just having turned purple] shouted at the top of her voice.' [p.161]

Central to the bits of nonlinguistic behaviour described in 14 are the quality of the speaker's voice ('low trembling voice', 'tone of great dismay', 'respectful tone', 'angry tone', 'at the top of her voice'), the speaker's gestures ('rubbing his hands', 'making faces', 'shook his head sadly'), the speaker's (changing) facial expression ('melancholy air', 'frowning'), the speaker's gaze ('anxious look'), the speaker's posture and body orientation ('down on one knee'). Moreover, each of these bits of nonlinguistic behaviour conveys at least some information. For example, the various tones described above convey fear, dismay, respect or anger; the gestures convey satisfaction, dissent, sorrow, and so on. Such bits of nonlinguistic behaviour, moreover, affect --- modulate, fill out, amplify, weaken, relativize, etc. --- the meaning of the utterances which they accompany. In addition to 13i, for example, let's consider various possible other utterances of the sentence *It's a pun!* Let's do so by considering an utterance of this sentence in some of the (eight) consecutive slots marked by the dots "....." in 14a-j, respectively. Though the statement-like 'meaning' inherent in the sentence *It's a pun!* remains the same, the listener's understanding of each distinct utterance is affected by the speaker's tone of voice, gestures, gaze, posture, body orientation and so on. For example, exclaimed in a tone of great dismay, an utterance *It's a pun!* is understood roughly as meaning 'It (= the previous utterance) is a pun and I am dismayed by this fact'. Spoken by someone rubbing his/her hands, the utterance is understood as meaning 'It (= the previous utterance) is a pun and I am delighted with this fact'. (Humpty Dumpty, as you may have noticed, is a master at 'fine-tuning' his language behaviour with the aid of gazes, gestures, postures, tones and so on. For example, he takes Alice to task for having confused his neck with his waist by saying to her 'in a deep growl', 'It is a --- *most provoking* thing .... when a person doesn't know a cravat from a belt!' [*TLG* 266])

13a-j and 14a-j, then, graphically illustrate a fourth specific property of (conversational) language behaviour: its **embeddedness in nonlinguistic behaviour**. From the examples it is clear how bits of language behaviour are 'fine-tuned' by

accompanying nonlinguistic acts performed by speakers. The 'meaning' of an utterance, both as intended by the speaker and as understood by the hearer(s), can be affected in a much more radical way, however, by the nonlinguistic behaviour in which it is embedded. Thus consider the following two contexts of nonlinguistic behaviour in which the sentence *Off with her head!* may be uttered:

15a 'Whilst making a chopping movement in the direction of the Duchess, the apoplectic Queen shrieked with a murderous look in her eye: "....."'

b 'Whilst gently rocking her baby, the Queen crooned in a soothing tone with a loving smile on her lips: "....."'

The 'meaning' inherent in the sentence *Off with her head!* remains the same. Yet in the nonlinguistic contexts of 15a and 15b the two utterances of *Off with her head!* differ radically as to the 'meaning' intended by the speaker. In the case of 15a, the accompanying nonlinguistic acts performed by the Queen make the literal meaning of 'she (= the Duchess) must be beheaded' a quite plausible 'utterance meaning'. In the case of 15b, by contrast, the literal 'utterance meaning' of 'she (= my baby must be beheaded' is ruled out by the accompanying nonlinguistic acts. This illustrates the huge extent to which the 'meaning' expressed and understood in any language behaviour can be affected by the nonlinguistic behaviour in which that language behaviour is embedded.[13]

We have reached a stage where it may be useful to glance both back and ahead. So far we have considered four of the more specific properties of language behaviour: its purposiveness, its cooperativeness, its spatio-temporal anchoredness and its embeddedness in nonlinguistic behaviour. These last three properties are instances of a more general property: much of language behaviour is **contextualized**. These three properties characterize what may be informally called a 'more outward side' of language behaviour. Language behaviour has a 'more inward side' as well, however,

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one not reflecting the ways in which language behaviour is contextualized. Rather, the 'more inward side' of language behaviour reflects the 'creative aspect of language use', to use an expression of Noam Chomsky's. We turn next to four of the properties that characterize this side of language behaviour.

3.2.5 Innovativeness

(In which Alice swims in a pool of tears she earlier wept herself)

Consider the following utterances, all from *Alice's Adventures in Wonderland*:

16a She soon made out that she was in the pool of tears that she had wept when she was nine feet high. [p.40]

b At last the Caterpillar took the hookah out of his mouth, and addressed her in a languid, sleepy voice ... [p.67]

c The roses growing on it were white, but there were three gardeners at it, busily painting them red. [p.105]

d The executioner's argument was that you couldn't cut off a head unless there was a body to cut it off from ... [p.116]

e The jury eagerly wrote down all three dates on their slates, and then added them up, and reduced the answer to shillings and pence. [p.146]

These utterances have the property of **being novel**: it is highly unlikely that they were produced before by Lewis Carroll or anybody else for that matter. Yet there is no reason to believe that Carroll found it particularly hard to produce these utterances --- his Alice stories bristle with such strikingly novel utterances. And generations of Carroll readers (fluent in English) have been able to understand these utterances without apparent difficulty, despite their novelty. Novelty is by no means a property restricted to written utterances of a 'literary' sort. As has been stressed since the fifties

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by Chomsky, the vast majority of spoken utterances are novel too. Indeed, few of the utterances regularly produced and comprehended by people are ones that they have used before, ones that they have somehow kept in store, ready in a 'prefab' form to be used a second or third time. People generally behave in a linguistically innovative way, producing and comprehending novel utterances as a matter of course. **Innovativeness** is indeed the most striking of the 'more inward' properties of language behaviour that we will consider. What the innovativeness of language behaviour involves is that 'the normal use of language is unbounded in scope', to use another expression of Chomsky's.[14]

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3.2.6 Stimulus-freedom

(On sending a little girl as a message by the telegraph)

A related 'more inward' property of language behaviour, singled out by Chomsky, is that it is **stimulus-free**: it is not controlled by stimuli outside or inside people. This property of language behaviour is beautifully illustrated by an episode in Alice's journey through Looking-Glass Country. In that episode Alice, boarding a train without having bought a ticket, offers the disgruntled Guard the excuse that "There wasn't a ticket-office where I came from". Consider now some of the utterances produced by the Guard and Alice's fellow-travellers in response to this excuse.

17a The Guard: 'Don't make excuses ... you should have bought one from the engine driver ... You're travelling the wrong way' [*TLG* 217-218]

b Gentleman Traveller: 'So young a child ... ought to know which way she's going, even if she doesn't know her own name!' [*TLG* 218]

c A Goat Traveller: 'She ought to know her way to the ticket-office, even if she doesn't know her alphabet!' [*TLG* 218]

d A Beetle Traveller: 'She'll have to go back from here as luggage!' [*TLG* 219]

e Traveller with a gentle voice: 'She must be labeled "Lass, with care", you know ...' [*TLG* 219]

f Traveller X: 'She must go by post, as she's got a head on her ...' [*TLG* 219]

g Traveller Y: 'She must be sent as a message by the telegraph ...' [*TLG* 219]

h Traveller Z: 'She must draw the train herself the rest of the way ...' [*TLG* 219]

The utterances 17a-g are all evoked by the same stimulus: Alice's excuse for her not having bought a ticket. But these utterances are strikingly dissimilar, both in meaning and in form or expression. If language behaviour were under stimulus-control, Alice's travelling companions would all have to produce the same utterance in response to her excuse. It is typical of linguistic behaviour that the utterances produced by a speaker on a given occasion cannot be predicted on the basis of linguistic stimuli --- previously produced utterances. Nor can they be predicted on the basis of nonlinguistic stimuli coming from inside or outside speakers. Since language behaviour is not subject to stimulus-control, it is possible for people to use their language, in the absence of any identifiable stimuli, for purposes such as thinking, self-expression, and so on.[15]

3.2.7 Appropriateness

(*In which the Gnat Traveller and the Horse Traveller come a conversational cropper*)

Suppose that, in response to Alice's excuse for not having bought a ticket, the following two utterances were produced as well:

18a Gnat Traveller: 'You might make a joke on that -- something about "horse" and "hoarse", you know.' [p.219]

b Horse Traveller: 'It is only a brook that we have to jump over'. [p.220]

Though being both good English and novel, these two utterances differ in an important way from those presented in 17a-h. In the given context, the latter utterances represent perfectly appropriate reactions to Alice's excuse. But even in a dream world, the utterances of 18a and b are not appropriate as reactions to this excuse. **Being appropriate** is considered by Chomsky to be a property of language behaviour that is related to but distinct from novelty and freedom from stimulus-control. Normal language behaviour --- or 'language use', in Chomsky's terminology --- is appropriate to situations that evoke but that do not control or cause it. What precisely appropriateness consists in has been a mystery to generations of linguists. Nevertheless it is clear that, as a 'more inward' property of language behaviour, appropriateness is linked to the 'more outward' property of cooperativeness: a speaker cannot be cooperative if he/she says things that are not appropriate. Chomsky's notion of appropriateness and Grice's idea of relation (or relevance) appear, in other words, to be two sides of the same coin.[16]

As properties of language behaviour, innovativeness, freedom from stimulus control and appropriateness belong to the same cluster. These properties are related in that each of them contributes to what Chomsky has called 'the creative aspect of language use'. The idea that language use has a creative aspect goes back at least to Descartes and his followers, who invoked it as a basis for distinguishing between humans and animals. In their view animals, unlike humans, lack the ability to use language creatively.[17]

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3.2.8 Rule-governedness

(On why not to pay words extra wages for extra work)

To say that people use language creatively is not to say that they can do just what they please when producing or comprehending utterances. For example, Alice's fellow-travellers were not really free to understand her excuse (repeated as 19a) as meaning either 19b or 19c.

19a There wasn't a ticket office where I came from.

b The land there is worth a thousand pounds an inch.

c She should have bought a ticket from the engine-driver.

Nor was the Guard, the Goat or the Beetle really free to produce the utterances 17a, 17c and 17d in the form of 20a, 20b and 20c, respectively.

20a Make don't you ... excuses have should one bought the from driver engine.

b She ought her way to know ticket-office to the, she doesn't even if her alphabet know.

c Luggage as here from back go to have she'll.

The fact that a wilful person cannot arbitrarily take 19a to mean 19b or 19c and the fact that 17a, 17c and 17d cannot be arbitrarily uttered as respectively 20a, 20b and 20c illustrate a fourth 'more inward' property of language behaviour: it is **lawful**. Or, as Chomsky has put it, the use of language is **rule-governed**: utterances are produced and comprehended in accordance with the rules of the language. And this is true even of make-believe worlds: none of the many extraordinary Carrollinian creatures behave linguistically in a lawless way. Not even the mad ones or, for that matter, Humpty Dumpty who boasted:

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> 'When *I* use a word - it means just what I choose it to mean - neither more nor less.' [*TLG* 271]

Humpty did claim that he could make words do a lot of additional work by paying them extra when they came round on Saturday nights to get their wages; he never actually, though, put his money where his big mouth was. The utterances he used when conversing with Alice were in fact squarely governed by the rules of English both in regard to expression (or form) and in regard to meaning.[18]

People cannot break the laws of nature; people can however, consciously or unconsciously, break the rules governing the production and comprehension of utterances. Someone who violates these rules runs the risk, though, of not understanding what others mean or of not being understood by others. This is one of the reasons why, when they realize that they have inadvertently broken a rule, people try to repair the damage. They can take corrective action by rerouting a derailed utterance in mid-course or by leaving a derailed utterance unfinished and by starting a new one from scratch, and so on.[19]

3.3 Kinds of language behaviour

(In which 'Jack and Jill' is sung backwards)

In the course of a rather trying encounter in Needle's Eye World, Jack got Alice to sing the little poem *Jack and Jill went up the hill* 'backwards':

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'Back uphill rolled Jack and Jill
Until Jack's crown was mended
They poured the pail down the well,
Then backwards redescended.' [*TNE* 93]

(If Gilbert Adair is to be believed, the tune went a little like *I dreamt I dwelt in marble halls*, a little like *Pop Goes the Weasel*, and whenever it wasn't like either of these, it sounded just like *God Save the Queen*.) What is more, giving in to Jack's prodding, Alice recited the poem in question in passable French, translating it as she went along. These two examples further show just how varied Alice's language behaviour was.

The kinds of language acts performed by ordinary people living in ordinary places is even more diverse. Think in this regard of the auctioneer attempting feverishly to inject some life into a spell of sluggish bidding, of the Pope solemnly intoning a formal prayer, of the fans joining in the action at Wembley by producing in unison their 'tribal' chants and taunts, of a Judge President pronouncing in measured tones the death sentence in a hushed court room, of a Paris mob baying for Marie Antoinette's head.

Can the seemingly endless variety of acts of language behaviour be seen as instances of a limited number of major kinds? If so, what are the major kinds of language behaviour in which people engage? We will focus on these questions below from the perspective of a distinction among forms, means and modes of language behaviour.

3.3.1 Forms of language behaviour
(Of bare bones and other basics)

One cannot have a genuine Carrollinian story in which there is not a little girl doing adventurous things, thinking funny thoughts or conducting strange conversations with

all sorts of curious creatures. Likewise, one cannot have a bit of language behaviour without people producing utterances, people comprehending utterances or people intuitively judging utterances. Producing, comprehending and intuitively judging utterances may consequently be taken to be the basic **forms of language behaviour**. To call these forms of language behaviour 'basic' is not, however, to say that they involve actions or processes that are simple or transparent at a microscopic level. It may seem 'obvious' or 'clear' what people do when they speak to others or when they listen to others; discovering the mechanics of speaking and listening (in the sense of comprehending) is a highly complex task, though, and demands the use of sophisticated forms of inquiry. Fortunately, our concern with the production, comprehension and intuitive judging of utterances requires no more than macroscopic inspection of these three forms of language behaviour.

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3.3.1.1 Producing utterances

(In which Alice is confused about the cause of lightning)

Producing an utterance such as *The March Hare dipped the watch into his cup of tea* has conventionally been thought of as 'transforming' an unobservable message into a stretch of observable speech, writing or signing. And what someone does in producing an utterance has been taken to involve four macro-activities: conceptualizing, formulating, externalizing, and self-monitoring. In what follows, people engaged in the production of utterances --- **speakers** in the case of spoken utterances, **writers** in the case of written utterances and **signers** in the case of signed utterances --- will collectively be referred to as **producers** (of utterances).

Conceptualizing includes everything that the producer has to do in planning and putting together what is called a 'preverbal message'. A preverbal message consists of what the producer intends to utter or convey: knowledge, thoughts, feelings, wishes,

intentions, sensations and so on. As for **formulating**, it is done in terms of two kinds of encoding. Through the first, called **grammatical encoding**, the preverbal message is 'hooked on to' a formal 'bearer': a string of words organized into what is called a 'surface structure'. The structured string of words is paired by means of the second kind of encoding with an externalizing plan. An externalizing plan contains instructions to those parts of the producer's neural and muscular system that help deliver the utterance by means of speaking, writing or signing. **Externalizing** the utterance consists in executing the latter plan: the structured string of words is rendered observable as a stretch of sounds, characters (letters, punctuation marks) or signs. In the case of speaking, the second kind of encoding is called **phonological encoding** and the externalizing of spoken utterances is conventionally referred to as **articulating**. The product of articulating is called **overt speech**.

Finally, through **self-monitoring** the producer checks whether he/she is conceptualizing, formulating and externalizing the utterance correctly. Monitoring allows the producer to detect and repair errors in a flash. The Red Queen was mistaken, therefore, when she told the floundering Alice that

> '... when you've once said a thing, that fixes it, and you must take the consequences'. [*TLG* 323]

The Red Queen's rebuke, incidentally, was sparked by Alice's detecting and repairing an error that she had made in conceptualizing something that she wanted to say:

> '"The cause of lightning," Alice said very decidedly, for she felt quite certain about this, "is the thunder - no, no!" She hastily corrected herself. "I meant the other way."' [*TLG* 323]

Whatever the cause of lightning may be in a world that has been stood on its head, detecting and repairing errors are part and parcel of producing utterances.[20]

3.3.1.2 Comprehending utterances
(Of toves gyring in the wabe)

Comprehending an utterance such as *The March Hare dipped the watch into his cup of tea* is aimed at recovering from the utterance the message encoded in it by its producer. People engaged in the comprehension of utterances - **listeners** in the case of spoken utterances, **readers** in the case of written utterances, and **'seers'** in the case of signed utterances - will in what follows be referred to collectively with the aid of the (somewhat awkward) expression **comprehenders** (of utterances).

It would be wrong to oppose the comprehension of utterances as a passive form of language behaviour to the production of utterances as an active one. Comprehending utterances is as active a business as producing them: making out the meaning of utterances is often quite taxing and may, in fact, be tiring. This is so even in dream worlds, as is illustrated by Alice's reading of the poem *Jabberwocky*, which both opens and closes with the following stanza:

> ''Twas brillig, and slithy toves
> Did gyre and gimble in the wabe:
> All mimsy were the borogoves,
> And the mome raths outgrabe.' *[TLG* 191, 197]

Alice found this poem 'very pretty' indeed, but 'rather hard to understand'; it seemed 'to fill her head with ideas'; only, she did not 'exactly know what they are'. 'You see',

Lewis Carroll confided in an aside to his readers, 'she didn't like to confess, even to herself, that she couldn't make it out at all.' [*TLG* 197]

It must be all the unfamiliar words --- *brillig*, *slithy*, *toves*, and so on --- that made it so hard for Alice to comprehend the utterances forming the poem, you may think.[21] This is partly true. But even utterances that contain no strange words may be hard 'to make out'. To see this, try comprehending the following utterances:

21a *The cat the executioner the queen employed beheaded grinned.*

b *The Queen hit the hedgehog hit it.*

c *The King's horses galloped through the rose garden stumbled.*

These utterances certainly contain no outlandish words; what is more, they are formed in accordance with the rules of English. Still, comprehending them requires quite hard work. Or didn't you stumble too in trying to get at their meaning?[22]

But what are the macroscopic **processing activities** --- or **processes**, as they are also called --- involved in the comprehension of utterances? The following four figure centrally in many models of comprehension: perception, recognition, parsing, and meaning assignment. In **perception** a comprehender identifies certain noises as speech sounds, certain marks on a surface as units of writing or certain hand and other movements as units of signing. In **recognition** the comprehender decides, on the basis of the perceived sounds, marks or movements and various other cues what the words are that have been uttered. In **parsing** the comprehender determines how a sequence of recognized words is internally organized or structured. **Meaning assignment** can be seen as having two basic aspects: interpretation and understanding. A comprehender works out the interpretation of a parsed sequence of words by taking into account, generally unconsciously, the meaning of individual words and the relations holding among the words. To arrive at an **understanding** of an utterance, the comprehender

makes its interpretation mesh with information from a variety of other sources of meaning. The latter include the nature of the speech act performed by the producer, the linguistic and non-linguistic context in which the utterance is produced, including the nonverbal behaviour that makes up the producer's body language, the knowledge which comprehender and producer have of each other, and so on. At a microscopic level, perception, recognition, parsing and meaning assignment are highly complex activities or processes made up of subactivities or subprocesses that are not yet fully understood. In addition, in the comprehension of utterances, these four macroscopic activities or processes interact in intricate ways about which scholars disagree on fundamental points.[23]

3.3.1.3 Judging utterances

(In which Alice picks up the aitches dropped by a Country Mouse)

As a judge, the King of Hearts was a rather schizoid character. He could not make up his mind about whether the Knave of Hearts was really guilty of stealing some tarts. Yet at the same time, he had no problem in passing judgement on the speech of one of the witnesses, telling the Hatter twice: "You're a *very* poor *speaker*". In making this linguistic judgement, the King acted just like ordinary people who regularly judge the properties of linguistic utterances in an intuitive way. Since this form of linguistic behaviour has not been studied in any great depth, we will be able to characterize it below in the most general of terms only, proceeding from the following questions: What are the more evident properties of the activity or process of judging linguistic utterances intuitively? Who is able to engage in this form of language behaviour? How is the intuitive judging of utterances interrelated with their production and comprehension? We will consider these questions against the background of par. 2.3, which contains various examples of intuitive linguistic judgements.

So what are the general features of a bit of behaviour or act such as the one that produces a judgement to the effect that the utterance *The Gnat sighed itself* is not (good) English? First, this is not an act in which people inspect something --- the utterance --- with the aid of the senses. The property of '(not) being good English' is not observable. Intuitively judging the properties of utterances is not, therefore, a form of perception. **Perception**, roughly, boils down to the observation of something material by means of the senses, with or without the aid of instruments. Obviously, judging utterances intuitively presupposes perception: someone cannot judge an utterance intuitively unless he/she has heard or seen it. But this does not make such judging a kind of perception. As in the case of overt speech, incidentally, both the mind's eye and the mind's ear also function as sense organs in the case of internal or silent speech.

Second, people are not conscious or aware of how they proceed in making an intuitive judgement of an utterance. In this respect, such judging or 'intuiting' contrasts with the mental activity known as 'introspection'. Some scholars think of **introspection** as the conscious taking of 'mental meter readings': people consciously inspect, analyze and so on the *content* of their mind, including their experiences, thoughts, feelings, wishes, desires, and so on.[24]

Alice, as you may know, was a little girl given to frequent bouts of introspection: delving into her own feelings, wondering about this and that, thinking things over --- often talking to herself in the process. For example, when her continual growing and shrinking had brought on an identity crisis, she dealt with this in a typically introspective fashion:

> '... as the hall was very hot, she kept fanning herself all the time she went on talking. "Dear, dear! How queer everything is today! And yesterday things went on just as usual. I wonder if I've changed in the night? Let met think: *was* I the

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> same when I got up this morning? I almost think I can remember feeling a little different. But if I'm not the same, the next question is, 'Who in the world am I?' Ah, *that's* the great puzzle!" And she began thinking over all the children she knew that were of the same age as herself, to see if she could have been changed for any of them.' [*AIW* 37]

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Clearly, an introspective judgement such as 'I am not sure who I am' and an intuitive judgement such as 'The utterance *I am not sure who I am* is good English' are as different as chalk and cheese, both in what they are about and in how they came into existence. It is of course possible to dwell introspectively on one's own intuitive judgements too: on their content, their origin, and so on. But the activity or process of making such judgements is not thereby itself changed into a form of introspection.

Third, people do not arrive stepwise at an intuitive judgement of an utterance. On the contrary, such judging is done in a rapid, flashlike way. In this respect, it contrasts with **analytic thinking**, which characteristically proceeds by way of a chain of explicit, well-defined steps of which the thinker is aware. Consider two cases in point: the ways in which the executioner and the Red King argued about the possibility of beheading the Cheshire Cat after the latter's body had already vanished:

> 'The executioner's argument was, that you couldn't cut off a head unless there was a body to cut if off from ... .
>
> The King's argument was, that anything that had a head could be beheaded ... .' [*AIW* 116-117]

Though the ideas involved in these two arguments are amusing, both reflect (simple) bits of analytic thinking that may be reconstructed as follows:

The Executioner's thinking

Premise 1: You cannot cut off a head unless there is a body to cut it off from.

Premise 2: The Cheshire Cat does not have a body (at the present moment).

Conclusion: Therefore, the Cheshire Cat cannot be beheaded (at the present moment).

The King's thinking

Premise 1: Anything that has a head can be beheaded.

Premise 2: The Cheshire Cat has a head.

Conclusion: Therefore, the Cheshire Cat can be beheaded.

Unlike argued-for views such as the two above, intuitive linguistic judgements do not have the nature of conclusions deduced from premises in a conscious step-by-step fashion. Once a particular intuitive judgement has been made, however, the judge can of course try to justify it afterwards by citing premises from which it follows (or appears to follow) as a conclusion. But this does not mean that the activity or process of intuitive judging is itself a kind of analytic thinking. People who do not have the right kind of training in linguistics will normally have no idea of the considerations that may be properly used as premises in such arguments.[25]

Fourth, judging an utterance intuitively cannot be done in a vacuum: it requires knowledge of the language in which the utterance was produced. If someone does not know Tohono O'odham, for example, it is impossible for him/her to judge that, in contrast to utterance 25b, utterance 25a is well-formed.

25a	*Huan*	*'o*	*wakon*	*g-ma:gina.*
	'John'	'is/was'	'washing'	'the car'

b	**Huan*	*g-ma:gina*	*'o*	*wakon.*
	'John'	'the car'	'is/was'	'washing'[26]

Judging utterances intuitively is not, therefore, a kind of activity in which someone's fantasy, imagination or some similar capacity is given free rein. Nor is it an exercise that draws on special 'powers' such as those that oracles, shamans or divinely inspired prophets are supposed to have. Judging utterances intuitively is constrained, rather, by a specific kind of knowledge (we will take up the nature of that knowledge once we have gathered together the threads of our reflections on the general features of this activity or process). As a form of language behaviour, judging utterances intuitively, then, is neither a mode of sensory perception nor a kind of introspection nor a species of analytic thinking. Rather, it represents a process of immediate apprehension which in a flash produces tentative insights or beliefs in people who have a certain kind of knowledge of language.[27]

So what do people have to know to be able to judge utterances intuitively? Alternatively: Who are the people capable of such judgemental language behaviour? The answer may seem evident: Ordinary people can judge utterances intuitively on the basis of the knowledge that enables them to produce and comprehend utterances in a language. This answer has been rejected, however, by scholars who have contended that only people who know the 'rules' of a language formally taught in schools or other institutions are capable of normatively judging utterances produced in the language.

Yet surely that contention is itself mistaken. As was noted in par. 3.3.1 above, for example, self-monitoring is part and parcel of the production of utterances. Recall that such self-monitoring boils down to the flashlike detection and repair of errors. As is clear from the literature, error detection of this kind is an instance of the intuitive judging of (parts of) utterances: it involves the immediate apprehension of mostly unobservable properties of (fragments of) utterances.[28] And there is no evidence that

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such self-monitoring is restricted to people who can read and write or to people who have received formal instruction in the 'rules' of the language.

Moreover, listening closely to certain conversations one cannot fail to notice that ordinary people monitor one another's speech too. Indeed, in recording as follows a bit of verbal interaction between Alice and a Country Mouse, Gilbert Adair describes a kind of language behaviour that is by no means peculiar to Carrollinian characters:

> 'I never knew such a comet for wiggling and wriggling," said the Mouse in a crotchety voice: "and why you 'ad to choose *my* haystack to fall into -"
> Alice was just about to insist that, for one thing, she was *not* a comet and, for another, she certainly hadn't *chosen* to fall into this or any other haystack, when she suddenly made out what it was in the Mouse's speech (apart from its being able to speak at all) that was puzzling her so: and, before she could stop herself, she blurted out, "How is it that you say ''ad' instead of 'had' and ''oped' instead of 'hoped', just like the road-sweeper does, yet you always manage to pronounce *haystack* correctly - "' [*TNE* 15]

Like the linguistically untrained Alice, ordinary people can and do judge utterances produced by other who speak or try to speak their language. Think in this regard of fluent speakers of a language judging (and sometimes correcting) utterances produced by nonfluent foreigners. Likewise, speakers of a prestigious form of a language such as English are known to judge intuitively --- and to comment unfavourably on --- utterances produced by speakers whose variety of the language, like the Country Mouse's Cockney, is looked down on.

How is the intuitive judging of utterances interlinked with the production and comprehension of utterances? This is a question we have yet to consider. The impression may have been created above that the intuitive judging of utterances is an

entirely isolated form of language behaviour. But this is not so; after all, such judging takes place in self-monitoring too. And self-monitoring, in turn, is involved in the production of utterances. What is more, self-monitoring presupposes the perception, parsing and interpretation by the monitor-cum-producer of his/her internal speech. Which means that production is not a completely self-contained form of language behaviour either: in the context of self-monitoring it presupposes comprehension. In short, to call a form of language behaviour 'basic' is not to rule out the possibility that it may be intertwined with other forms of language behaviour.[29]

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Indeed, some things, by their very nature, come joined together. Take, for example, Ping and Pang, the Siamese-Twin cats that Alice met in Gilbert Adair's Needle's Eye World. Ping and Pang, you see, were attached to opposite ends of the same tail; one could not have Ping without getting Pang into the bargain, and vice versa. The two physically entailed each other. Things or activities that are more abstract than Siamese cats can stand in the same kind of relation to each other of course. For instance, if there are forms of language behaviour that are in a sense basic, there have to be other forms of language behaviour that are nonbasic. And, indeed, the second layer of linguistic reality includes various **nonbasic** or **compound forms of language behaviour.**

We have in fact already witnessed an act of language behaviour of a compound sort: Alice's translating the English nursery rhyme

> 'Jack and Jill went up the hill
> To fetch a pail of water.
> Jack fell down and broke his crown,
> And Jill came tumbling after.'

into the French:

'Jacques et Jacqueline sont montés à la colline
Pour remplir un gros seau de l'eau.
Jacques est tombé en se cassant le nez,
Jacqueline aussi - ' [*TNE* 94]

But in what sense would **translation** be a compound form of language behaviour? Primarily, in the sense that it involves combining comprehension and production, two basic forms of language behaviour, in a specific, coordinated way. Secondarily, in the sense that two languages are involved: having comprehended (a set of) utterances in language A (the **source language**), the translator produces (a set of) sufficiently equivalent utterances in language B (the **target language**).

The 'trick' of translation lies in producing utterances in the target language which are sufficiently equivalent to those utterances of the source language in terms of the right factors. These factors include more than 'meaning', as Alice was able to learn from the following appraisal of her French translation:

> '"Grosso modo" said Jack sagely, completing the rhyme (The phrase is Latin, you see, and it means 'more or less'.) "You were a trifle free with names" - here Jill scowled more than usual at Alice....' [*TNE* 94-95]

The utterances of the target language may be required, that is, to be equivalent to those of the source language not only in regard to 'meaning' but also in regard to the kinds of words, phrases or other linguistic forms used.[30]

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3.3.2 Means of language behaviour

(On learning how to 'reel' and writhe' in a school under the sea)

Asked by Alice what he stood for in the forthcoming election, Gilbert Adair's Emu replied in a rather aggressive tone: 'I stand for everything beginning with an F'. And, to clarify the meaning of this enigmatic statement, he recited a little 'poem' whose closing stanza reads as follows:

> 'Oh, f's the only letter
> The world can count upon;
> For, without f's ther'd be no ifs
> And dreams would end anon. [*TNE* 61]

Despite having listened attentively to the 'poem', Alice was far from happy with her understanding of it:

> 'I feel certain it *does* have a meaning somewhere, and I almost understand it already. Perhaps it would be easier for me to follow if I had it written down' [*TNE* 61]

Clearly Alice believed that (re)reading the recited text would offer her a better chance of making sense of the 'poem'. This little episode illustrates the four most important means of behaving linguistically: speaking and writing as means of producing utterances and, complementary to these, listening (or hearing) and reading as means of comprehending utterances. Not illustrated by the episode are a third productive means, namely signing, and a third receptive means, namely 'seeing (signs)'. Below we will focus on the pairs of speaking/listening and of writing/reading (signing/'seeing (signs)' is restricted to a very small number of people). From our macroscopic perspective, we will be concerned with the following questions: What is a means of language

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behaviour? What is the nature of the differences between speaking/listening and writing/reading as the two most important pairs of means of behaving linguistically? Is one of these pairs in some sense(s) basic or primary vis-à-vis the other?

What, then, is a means of language behaviour? To get a grip on the notions involved here, we will start out from the distinction between means of producing utterances and means of comprehending or 'receiving' utterances. Two things distinguish **means of producing utterances**: firstly, the channel through which the producer produces an utterance; secondly, the medium or substance in which a producer produces an utterance. In **speaking**, the producer uses the oral (or vocal) channel for uttering a sentence in a phonic medium. In **writing**, the producer normally uses what may be called the 'manual' channel for uttering a sentence in a graphic medium. Note what, on this characterization, writing is *not*: writing is not the graphic representation of a spoken utterance signal (neither the speech sounds of the signal nor any of its other properties).

A **means of comprehending utterances**, by contrast, is distinguished by its using a particular sensory **modality** for recovering a message uttered in a specific medium. **Listening** (or hearing) involves the use of the aural or auditory modality for recovering a message uttered in a phonic medium; **reading** uses the visual modality for recovering a message uttered in a graphic medium. A last point of terminology: as a pair of complementary means, speaking/listening has conventionally been referred to as 'speaking', for short; and, analogously, writing/reading as a pair of complementary means has been referred to for short as 'writing'. Where no misunderstanding can result, we will also follow this abbreviatory terminological convention.[31]

As means of acting linguistically, speaking and writing, then, differ primarily in regard to channel and modality. But there are other differences too if one compares speaking in the canonical setting of face-to-face conversation with writing in the typical setting

of the (academic) exposition of ideas or information. The former setting differs in important ways from the latter. In the case of conversational speaking, there are two or more participants present who share space, time and knowledge of each other. Both their production and their comprehension of utterances, moreover, are constrained by what are called 'real-time factors'. Expository writing is typically done in a setting that lacks these features. As a consequence, expository writing and conversational speaking differ from each other in various ways, to three of which we next turn.

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Conversational speaking, firstly, is typically **more highly interactive** than expository writing. The listener(s) or addressee(s) present in the typical setting of face-to-face conversation can --- and do --- react directly to the speaker's utterances, either verbally or through their body language. Such direct feedback may --- and do --- cause the speaker to modify his/her language behaviour: aborting utterances, 'rerouting' utterances in mid-course as it were, producing additional utterances intended to clarify, amplify, retract etc. earlier utterances, changing the topic and so on. Listener feedback often causes the speaker to give up voluntarily his/her turn to speak. Or he/she may be elbowed out of the conversation by listeners impolitely grabbing a turn to speak.

The highly interactive nature of face-to-face conversation is entertainingly illustrated by the way in which Humpty Dumpty reacted to Alice's verbal and nonverbal intrusions into his speech. Irked by the feedback he was getting from her, he zig-zagged verbally as follows:

> '"Of course I don't think so [that I'd be safer down on the ground]. Why, if I ever *did* fall off [the very narrow wall] - which there's no chance of - but *if* I did -" Here he pursed up his lips, and looked so solemn and grand that Alice could hardly help laughing. "*If* I *did* fall," he went on, "*the King has promised me* - ah, you may turn pale, if you like! You didn't think I was going to say that, did you? *The King has promised me - with his very own mouth* - to - to -"

> "To send all his horses and all his men," Alice interrupted, rather unwisely.
>
> "Now I declare that's too bad!" Humpty Dumpty cried, breaking into a sudden passion. "You've been listening at doors - and behind trees - and down chimneys - or you couldn't have known it!" [*AIW* 263-264]

Typical expository writing has none of the interactive properties in question, because the readers, some or all of whom may even be unkown to the writer, are typically not present at the time of writing. As a result, of course, expository writing is much less suitable for interactional purposes than is conversational speaking.

Conversational speaking, secondly, is typically **more highly contextualized** than expository writing. Such speaking depends on and makes use of the physical setting and background knowledge shared by the participants. For example, to indicate when or where something happened or will happen speakers can say relatively little, using deictic expressions such as *now*, *then*, *soon*, *earlier*, *later* and *here*, *there*, *above*, *behind*. Listeners are required to infer the intended time or place from their knowledge of the physical context and the knowledge they share with speakers. Expository writing cannot use non-specific situation-dependent reference in this way. Being more decontextualized in the above sense, such writing has to refer to times, places, persons and so on in a more explicit and elaborate way. All of this means that a person speaking in a typical conversational setting can achieve certain purposes by less linguistic effort than can one who is writing in a typically expository setting.

Conversational speaking, thirdly, is typically **less highly planned** and **less deliberately executed** than expository writing. This is so because producing and comprehending utterances in a typical conversational setting are activities that are performed in real time. And spoken utterances typically are short-lived phenomena, existing fleetingly only. In a normal conversation - in which two to three words per second are produced - a speaker simply does not have sufficient time to carefully plan, rehearse, manage and

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edit his/her speech. And the fact that speakers often forget the first part of relatively long spoken utterances affords them even less control over the production of such utterances.

Expository writing, by contrast, is typically less subject to time and memory constraints. A writer normally has enough time to plan, organize and produce his/her utterances more carefully. And the relatively permanent nature of a written utterance allows the writer to revise it over and over, should he/she care to do so. Such revision, moreover, is normally not affected by limitations on the writer's short-term memory.

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Like speakers, listeners have relatively little time for processing utterances. They cannot listen again to (unrecorded) spoken utterances, taking their time to sort out problems they might have had in comprehending the utterances. This is why Alice failed to comprehend the following utterance, addressed to her by the Duchess in the course of a face-to-face conversation:

> 'Never imagine yourself not to be otherwise than what might appear to others that what you were or might have been was not otherwise than what you had been would have appeared to them to be otherwise.' [*AIW* 122]

Alice's response to this utterance --- which the Duchess had produced to 'put more simply' the moral 'Be what you would seem to be' --- is quite unsurprising:

> 'I think I should understand that better ... if I had it written down: but I can't quite follow it as you say it.' [*AIW* 122]

Reading, typically, is not constrained by time in the way that listening is: readers can reread written utterances, 'digesting' them in a deliberate way in order to get at their

meaning. This, incidentally, is the reason why Alice would have preferred a written version of the Emu's poem about the value of f's and their fellow-letters.[32]

The above-mentioned differences between conversational speaking and expository writing do not indicate that, as a means of conveying messages or meaning, speaking is in principle less adequate than writing. That is, speaking and writing do not differ absolutely in regard to the capacity for representing ideas or information. For certain practical reasons it may indeed be better to write something rather than to say it. But in principle messages or meanings are neutral in regard to speaking and writing. There are no messages that can be uttered by writing but not by speaking or vice versa. As for 'utterability', messages are **means-independent** or **means-neutral**. This is obviously not to say that both speaking and writing can be used for *all* the purposes considered in par. 3.2.1 above. We have been comparing speaking and writing here from the perspective of one purpose only, namely that of the representation of ideas or information.[33]

But what about the spoken and written utterances that are the products of conversational speaking and expository writing, respectively? Do the linguistic properties of these two types of utterances somehow reflect one or more of the differences between the two means of language behaviour? Many linguists believe that they do. It has been contended, for example, that utterances produced by expository writing tend to be **structurally more complex or elaborate** than utterances produced by conversational speaking. The former utterances are believed to be longer and constructed more tightly, often of components which are complex themselves. In comparison with spoken utterances, written utterances, moreover, have been claimed to be **semantically more explicit** both in the sense of expressing ideas more fully and in the sense of expressing the logical links between these ideas. And, to mention one more alleged difference, utterances produced by expository writing have been taken to be **informationally**

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richer in the sense of typically carrying more new information than utterances produced by conversational speaking.

These three differences between the two types of utterances in question appear to reflect the fact that expository writing is typically planned in a more careful way and executed in a more deliberate fashion than conversational speaking. But, it has been found that even in a conversational setting people produce utterances that are structurally highly complex, semantically quite explicit, and informationally very rich. Not only members of Lewis Carroll's House of Cards are capable of producing spoken utterances that have these properties. Ordinary people can do so too. This means that the relation between the properties of utterances and the means used to produce them is of an indirect sort.[34]

Viewed from various perspectives, speaking is more basic than writing. Consider, for example, a **phylogenetic perspective**: in the developmental history of the human species, speaking goes much further back than does writing. It is generally believed that at no time in the history of modern man has there existed a society that could not and did not speak. Writing, by contrast, is a relatively late development in this period. It is estimated that our species started to speak between 50,000 and 30,000 BC. People began to write systematically, however, only about 6,000 years ago, when the first writing systems were developed in the Near East. And even today there still exist whole communities that are illiterate, lacking the ability to write and read.

Speaking is not only phylogenetically basic: it is fundamental from an **ontogenetic perspective** too. That is, in the development of normal individuals speaking comes before writing. And though they can and do speak in a perfectly normal way, millions and millions of people never learn to read and write. Even Carrollinian worlds are quite ordinary in this regard, not having among their dramatis personae creatures that can read or write without being able to speak or listen as well. Not even the Hairdresser in

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Needle's Eye World is a real exception in this regard. An Italian, he spoke in Italics, which in Alice's judgement

> '... had a queer emphasis to it, and there was something sloping and not quite straight-up-and-down about the pronunciation (and I hope you understand what I mean, for I'm sure I don't).' [*TNE* 50]

What makes the Hairdresser such a delightfully curious character is, of course, his funny way of speaking, not of writing.

In normal children, moreover, the ability to speak develops in a natural way, with conscious learning and deliberate teaching playing an insignificant role in the process. Learning to write and to read is a different matter altogether, as the majority of literate people will be able to recall. It requires a lot in the way of conscious learning and formal instruction. Even in Wonderland the Mock Turtle and the Gryphon had to go to school every day to learn Reeling and Writhing in the same way as the branches of Arithmetic called Ambition, Distraction, Uglification and Derision as well as such other subjects as Mystery (Ancient and Modern) and Seaography [*AIW* 128-130].[35]

But what would the point be of observing that speaking is from various perspectives more basic than writing? Certainly not to downgrade the role that writing has played in the development of advanced civilizations such as our own. Even Lewis Carroll would have been hard pressed to dream up a world that was culturally, scientifically and technologically as rich as ours but that utterly lacked writing (or some means of language behaviour functionally equivalent to writing). Indeed, in such a world his own stories would have remained unwritten! No, to observe that speaking is more basic than writing is to stress the point that language behaviour consists primarily in people speaking and listening. The world of language, indeed, is inhabited by creatures belonging to the species of *homo loquens*.

3.3.3 Modes of language behaviour

(Of Siamese-Twin Cats speaking in tandem)

Still remember Ping and Pang? Well, they were not linked to each other anatomically only. Their behaviour was Siamese-like too: they laughed and cried together and, as Alice discovered to her amazement, they even spoke in tandem:

> '... the Cat at her left arched its back, and said in a high piercing voice, "I declare! It [i.e., Alice] speaks - and I imagined - "
>
> " - it was only in fairy-tales -" continued the Cat at her right.
>
> "- that human beings could speak," said the first Cat, abruptly ending the sentence.' [*TNE* 24-25]

Ping and Pang's actions go to show that when it comes to speaking, there are many ways of killing a cat indeed. This point carries over to the language behaviour of ordinary people who --- as individuals, pairs or larger groups --- regularly speak, listen, read and write in a multitude of different ways or modes.

But what is a mode of speaking, listening, reading or writing? Some examples will help us towards an answer to this question. Two of the most common modes have already been inspected in par. 3.3.2 above: conversational speaking in the setting of face-to-face contact and expository (academic) writing. But there are many other modes of language behaviour. Think, for example, of the modes of speaking used commonly in the setting of telephone conversations, of verbal duelling (like playful banter), of conversational storytelling, of talking to oneself, of delivering prepared speeches (including lectures, sermons, etc.), of broadcasting, of sports commentary, of dictating letters, of stock market trading, of drilling a squad of recruits, of auctioning goods, and

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so on. And there are various different modes of listening too, including those involved in listening intently ('with strained ears') to what someone is saying, in listening absentmindedly or uninterestedly ('with only half an ear') to a speaker, in overhearing accidentally (snatches of) a conversation, in eavesdropping deliberately on people and so forth. As for modes of writing, think of those found in roughly drafting a first version of a (piece of) text (e.g., a news report, a suspense story, a scholarly paper or a poem), in carefully rewriting such a first draft, in quickly jotting down some ideas in telegraphese, in listing or tabulating figures or other data, and so on. Finally, different modes of reading are evidenced by skimming, by scanning, by close reading, by reading aloud, by proofreading, and so forth.

A mode of speaking, listening, writing or reading, then, is in essence a distinct way of using the means in question. By speaking in a mode A (say conversational speaking) someone does something that differs in one or more typical respects from what he/she does when speaking in a mode B (say giving radio commentary on a horse race). The differences that set two modes of speaking apart come from differences in how speakers perform one or more of the activities --- conceptualizing, formulating, externalizing (i.e., articulating) and self-monitoring --- that make up speaking. Similarly, differences between distinct modes of listening, between distinct modes of writing or between distinct modes of reading result from performing the component activities of these means of language behaviour in different ways.[36]

Conversational speaking and expository writing are relatively pure modes of speaking and writing, respectively. In between the former, most purely oral, mode of speaking and the latter, most purely literate, mode of writing, there lie various **mixed modes of speaking and writing**. These include oral modes of writing --- i.e., modes of writing whose products are intended to be spoken --- and literate modes of speaking --- i.e., modes of speaking whose products are intended to be written down. All modes of writing texts intended for public delivery --- speeches, formal lectures, sermons etc. ---

represent oral modes of writing. Giving unprepared lectures, making off-the-cuff speeches and making impromptu press statements, by contrast, are examples of literate modes of speaking. Certain modes of speaking (e.g., giving prepared formal lectures) and certain modes of writing (e.g., expository writing) are quite similar. The reverse is true too: certain modes of speaking (e.g., conversational speaking) are quite different from certain other modes of speaking (e.g., prepared public speaking). Likewise, certain modes of writing (e.g., writing formal academic expositions) are quite different from certain other modes of writing (e.g., writing informal personal letters). Observations such as these indicate that speaking (in all its modes) and writing (in all its modes) do not form a simple oral vs. literate dichotomy. There is rather an **oral-literate continuum** with conversational speaking and expository writing representing opposite, yet ultimately connected, poles. Between these lie more/less oral/literate modes of speaking/writing such as those mentioned above.[37]

The kind of mixing involved in the mixed modes of speaking and writing mentioned above differs from the kind of mixing illustrated by Jack's saying to Alice:

'Grosso modo .... You were a trifle free with names, you know ...'

This utterance is a product of Jack's using two languages --- Latin and English --- for encoding a message that he wished to convey to Alice. The kind of mixing illustrated by Jack's utterance --- known as **language mixing** --- takes on various forms. Someone can, of course, at one and the same time mix various modes of language and various languages, using, for example, both English and Latin in writing out a sermon to be delivered orally as part of a church service.

But let us return to the observation made at the beginning of par. 3.3, namely that there seems to be a limitless variety of acts of language behaviour. Much of this variety, we can now see, is due to the wide range of modes of speaking, listening, writing and

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reading. And we have merely scratched the surface, having identified above some of the more commonly used modes only.

There are very many less commonly used modes indeed. Think of the town crier shouting out for all to hear that the whales are back to overwinter in the bay, of Pavarotti carrying on in a high C about a hand that is both tiny and frozen, of Muhammad Ali boasting rhythmically 'Only last week/Ah murdered a rock/Injured a stone/Hospitalized a brick/Ah'm so mean/Ah made medicine sick'. Or of the pilot urging folk down below in vapour words to 'Vote Ted', of the skinhead spraying his denunciation of the system on the town hall wall, of the stonecutter chipping out on a slab of marble 'Here lies John Doe'. Town crying, opera singing, rapping, skywriting, graffiti spraying and stone engraving are but a few examples of the host of less commonly used modes of producing utterances that make language behaviour such a richly varied layer of linguistic reality. And we have not even begun to look at such quaint modes of language behaviour as those involved in the writing and reading of the Looking-glass book that puzzled Alice with lines such as the following:

JABBERWOCKY

'Twas brillig, and the slithy toves
Did gyre and gimble in the wabe:
All mimsy were the borogoves,
And the mome raths outgrabe.

[*TLG* 191]

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3.4 The bounds of language behaviour

(*On the Red Queen's view of linguistic dynamics*)

Always quick on the draw, the Red Queen was not given to accepting without argument what others had to say about Looking-Glass Country. This Alice found out the hard

way when she referred to a rising as a 'hill', only to be summarily contradicted by the Queen:

> 'When you say "hill" ... I could show you hills, in comparison with which you'd call that a valley.' [*TLG* 207]

And when Alice protested that it would be nonsense to call a hill a 'valley', she was abruptly put down once more:

> 'You may call it "nonsense" if you like ... but I've heard nonsense, compared to which that would be as sensible as a dictionary!' [*TLG* 207]

So if we were to conclude this chapter by saying that our inspection of the layer of language behaviour revealed it to be an action-packed place, the Red Queen would in all likelihood profess to have seen other places in the world of language, compared to which this layer of land is as lifeless as dust.

And, even allowing for the Queen's tendency to exaggerate, we would have to concede the point. For, as we peer through our macroscope at some of the other large-scale features of the world of language, you will see lots of things happening outside the layer of language behaviour. Take, for example, the case of people acquiring or losing their language(s). Or that of languages being born, growing, changing, declining or dying. Undeniably, language birth, growth, change, decline and death form part of the dynamics of linguistic reality. But these are slow-moving processes which cannot readily be thought of as acts of purposive language behaviour. Linguistic dynamics, that is, should not be equated with language behaviour. The Red Queen would be right to insist that the dynamics of the world of language are by no means exhausted by what happens within the bounds of its behavioural belt.[38]

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4 Its Capacities Stratum

> *'It is a very inconvenient habit of kittens (Alice had once made the remark) that, whatever you say to them, they always purr. "If they would only purr for 'yes' and mew for 'no', or any rule of that sort," she had said, "so that one could keep up a conversation!"' [TLG 341]*

What does it mean to say that someone is 'a very poor speaker'? This, you may remember, is what the King called the Hatter in rebuking him for saying things such as:

> 'I'm a poor man, your Majesty ... and I hadn't begun my tea --- not above a week or so --- and what with the bread-and-butter getting so thin --- and the twinkling of the tea ---' [*AIW* 148]

Clearly, it was the oddness of utterances such as these that triggered the King's irate judgement. But in calling the Hatter 'a very poor speaker', the King most likely had something else, something deeper, in mind too. The Hatter, you see, didn't produce just the occasional wayward utterance; on the contrary, he spoke like this much of the time, even in formal settings. And so, the evidence he gave in the trial of the Knave --- who stood accused of stealing some tarts made by the Queen of Hearts on a summer's day --- was simply littered with such aberrant utterances. In all likelihood, therefore, the King had also meant that there was something seriously amiss with the Hatter's capacity to speak. And, for once, the King would have got it right: a very poor speaker is someone whose capacity to speak is less than up to scratch, not merely someone who accidentally produces an odd utterance now and then.

Which brings us to the general point: language behaviour presupposes various **language capacities**. That is to say, underlying the layer of language behaviour, linguistic reality must have a deeper layer, namely **the layer of language capacities**. It

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is on these capacities that we will focus in the present chapter, considering questions such as the following: What are the language capacities without which language behaviour would be simply impossible? By what macroscopic properties are these language capacities characterized? How are the various language capacities interlinked? In pursuing these and related questions, we will concentrate on the language capacities presupposed by the two more basic means of language behaviour, which --- to repeat --- are (i) speaking and (ii) comprehending spoken utterances.

Before beginning to explore the layer of language capacities, let us think for a moment about the whereabouts of this layer of the world of language. What matters here is that it is a hidden layer, covered as it is by the more outward layers of language products and of language behaviour. As a result, language capacities are even less amenable to direct inspection than language products or language behaviour are. To study the nature and properties of language capacities, scholars have to use indirect means, in particular those of theory construction and theory testing. But, of course, the hypotheses that go to make up theories are in essence guesses, though of a constrained sort; so, understandably, scholars disagree even about macroscopic properties of language capacities. It follows, too, that the partial reconstruction offered below of the architecture and dynamics of the layer of language capacities can at best be tentative. But perhaps you find this entirely unsurprising. After all, we have reached this layer by falling down a conceptual rabbit-hole, travelling in the process through two other layers of the world of language. And like real rabbit-holes, conceptual ones also grow darker and darker as they wind downwards away from the surface. The deeper things lie, in short, the harder it becomes to make out what they are really like --- language capacities being no exception to the rule. But let us turn to the first kind of language capacities.

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4.1 Capacities for language processing

(In which the way is paved for the King's Messengers)

Producing utterances and comprehending utterances, as we have seen, can be taken to be the two most basic forms of language behaviour. Producing an utterance of a sentence such as *The Cheshire Cat sat on a branch for a while*, for instance, involves 'transforming' an unobservable message into an utterance signal, which is a stretch of observable speech, writing or signing. And comprehending an utterance of a sentence boils down to recovering the intended message from such a signal. What happens when someone produces or comprehends an utterance is called **(language) processing**. Now, producing utterances and comprehending utterances are not the same thing; so, on functional grounds, people can be expected to have two basic capacities for processing utterances: a **(language) production capacity** and a **(language) comprehension capacity**. In the case of spoken language, the first of these capacities is realized in what is conventionally called the **speech-production system**, and the second is realized in the **speech-comprehension system**.[1] It is with these two systems that we will be concerned below, considering them first from the point of view of their architecture, and then from the point of view of their dynamics.

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4.1.1 Functional architecture

(Of Executioners, Executors, Exhumers and other '-ers' & '-ors')

4.1.1.1 Speech-production system

(In which utterances and Wonderlanders alike are processed)

On a well-documented view, the processes (or processing activities) involved in producing a spoken utterance can be partitioned into three macroscopic **processing components** or **processors**: the Conceptualizer, the Formulator and the Articulator.[2] Each of these components receives a certain kind of input and produces a certain kind

of output. And the output of one of these processors can form the input to another one of them.

But what do the terms 'input' and 'output' mean here? To get to grips with this question, we can think of the raving Queen and her overworked Executioner as processors. Doing this, we can say the following: what the Queen takes as input are unsuspecting Wonderlanders (generally innocent, to boot); then, by applying to them a process of sentencing, what she produces as output are candidates for beheading. Taking these sentenced but still 'headed' creatures as input in turn, the Executioner processes them by means of his axe, transforming them into an output of headless bodies and bodiless heads. But let us get back to the processors, luckily less lethal, that operate in speech production.

The processing that takes place in the **Conceptualizer** --- called 'conceptualizing' in par. 3.3.1.1 --- includes everything that the speaker has to do in planning and putting together a preverbal message. This message, you may recall, consists of what the speaker intends to utter or convey, including knowledge, thoughts, feelings, wishes, sensations and so on. In the case of an utterance of *The Cheshire Cat sat on a branch for a while*, for example, the Conceptualizer forms three conceptual units --- an EVENT (the Cheshire Cat's sitting before the time of the utterer's speaking), the PLACE of that event (the sitting took place on a branch) and the DURATION of that event (the sitting lasted for a short while only); the Conceptualizer also, however, joins these three conceptual units into an output, namely a single coherent preverbal message.

In the case of a spoken utterance such as *The Cheshire Cat sat on a branch for a while*, the **Formulator** accepts as its input certain fragments of preverbal messages --- for example an EVENT, a PLACE, a DURATION and so on --- and produces as its output

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an articulatory plan. Also known as **encoding**, formulating involves two main subprocesses. In the first, **grammatical encoding**, formulating 'translates' a fragment of conceptual structure into one or more syntactic units. In so doing, it selects lexical items whose meanings match parts of the intended conceptual structure or preverbal message. In the case of the past event of the Cheshire Cat's sitting, for example, formulating selects *the*, *Cheshire Cat* and *sat* as lexical items whose meanings match the EVENT fragment of the preverbal message. In addition, the lexical items selected in this way are grouped by formulating into specific ordered strings, for instance syntactic surface structure phrases such as the Noun Phrase *The Cheshire Cat* and the Prepositional Phrase *on a branch.* These syntactic phrases, in turn, formulating organizes into bigger phrases (such as the Verb Phrase made up of the verb *sat* and of the Prepositional Phrase *on a branch*) and clauses (such as *The Cheshire cat sat on a branch for a while*).

Units or constituents of syntactic surface structure form the input to **phonological encoding**, the second main subprocess involved in formulating. By means of phonological encoding an articulatory or phonetic plan is built or retrieved for syntactic surface structure units such as words, phrases or clauses. Such a plan will specify for *Cheshire*, for example, that it forms the first, more heavily stressed part of a compound word; that it consists of two syllables; that the first syllable is phonetically more prominent (stressed) than the second one; that the first segment is /tʃ/ and so on. An articulatory or phonetic plan, it is held, represents a speaker's internal speech. This internal speech is not yet overt speech, but rather a programme for articulation that has still to be executed. Made up of the musculature of the respiratory, laryngeal and supralaryngeal systems, the **Articulator** takes as its input the chunks of an articulatory plan and produces overt speech on the basis of the information borne by these chunks.

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As we noted in par. 3.3.1.1, speaking involves the speaker's monitoring both his/her internal speech and his/her overt (or external) speech. Through self-monitoring, a speaker checks whether he/she has been conceptualizing, formulating and articulating the intended message and the corresponding utterance correctly. This self-monitoring allows the speaker to detect and correct errors in a flash. If this self-monitoring is done in a special processing component --- as some language scholars believe --- the **Monitor** is a complex 'character'. Its basic job is to judge the speaker's speech, both internal and overt. But this judging presupposes that the monitor comprehends such speech; also, the Monitor's judging leads it directly to repair what it judges to be bad in such speech. So, interwoven in monitoring, we find processes involved in the judging, comprehension and production of utterances.

To sum up: viewed within a macroscopic perspective, the architecture of people's **speech-production system** looks as follows:[3]

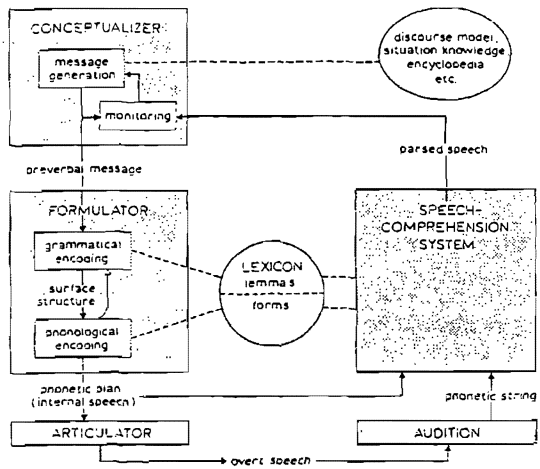

Figure 1: Levelt's (1989) Blueprint for the Speaker

It should be kept in mind that the processing components --- represented by the boxes in the diagram above --- are delimited on the basis of function. That is to say, processes that do the same kind of job in the production of utterances are taken to belong to the same component. This means, then, that the diagram presents a large-scale picture of the **functional architecture** of a speaker's speech-production system. Accordingly, the diagram is not to be taken as somehow directly picturing or mapping something physical, for example one or more parts of a speaker's body. This is a point to which we will return in par. 4.1.2 below.[4]

4.1.1.2 Speech-comprehension system

(In which the Queen of Hearts suffers a stroke at long last)

But what about speech comprehension? Is there really a separate system for the processing that takes place in the comprehension of an utterance such as *The Cheshire Cat sat on a branch for a while*? The diagram above, and in particular the big empty box labelled 'SPEECH-COMPREHENSION SYSTEM', suggests that people have a speech-comprehension system that is distinct from their speech-production system. Is there any evidence indicating that these two systems are genuinely distinct? At first glance, it may well appear more 'economical' for people to have a single system for language processing: a system used in one direction when utterances are being produced and simply used in reverse when utterances are being comprehended. But there are strong indications that linguistic processing is not done by a single dual-purpose processing system. Rather, it appears, people have distinct systems for producing utterances and for comprehending utterances.

In this regard, something quite instructive happened towards the end of the curious croquet game organized by the Queen of Hearts in Wonderland. (Lewis Carroll kept

quiet about this incident for reasons of his own; as you will see presently, the incident was a most tragic one.) Having flown into yet another purple rage over a player's unruly conduct, the Queen began to shriek in a strange, halting way:

> 'Off with his ... er ... hair .... his hat ... er ... hand ... his whatsitsname!'

And, turning to the Executioner, she continued in the same tentative way:

> 'Get on with it, examiner ... er ... exhumer ... I mean executor .... or whatsyername!'

In producing these utterances --- and they were followed by a string of similarly odd ones --- the Queen seemed unable to find the right words, specifically *head* in the first utterance and *executioner* in the second. She had no problem whatever, though, in comprehending things spoken to her by fellow-players. This is clear from the fact that she grew even more agitated at various utterances of theirs: the King's perplexed exhortation *Pull yourself together, my dear!*, the startled March Hare's indignant protestation *I'm nobody's hare to be cut off!*, the Hatter's muttering of the inane phrases *Hats off to the Queen, hats off to her Majesty* ... and Alice's frightened cry *Oh dear, she's getting furiouser and furiouser!*

What the King and the others did not realize (not at first, at any rate) was that the Queen had suffered a stroke, which temporarily impaired her speech-production system. The stroke caused her to suffer what is known as **specific anomia**. This condition impairs certain processes of selecting or producing words of a specific sort, though without generally affecting other productive processes. Or --- and this is important to us --- without generally affecting processes involved in the comprehension of spoken utterances. Data about language pathologies such as specific anomia indicate

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that a language user's system for producing spoken utterances is not the same as his/her system for comprehending spoken utterances.[5]

This partly resembles the situation in which the White King employed more than one messenger:

> 'I must have *two*, you know [he explained to Alice] --- to come and go. One to come and one to go.' [*TLG* 280]

And, irked by Alice's question 'Why one to come and one to go?', the King repeated impatiently:

> 'I must have *two* --- to fetch and carry. One to fetch, and one to carry.' [*TLG* 280]

In a sense, the Queen had a 'fetcher' and a 'carrier' too. Whereas her 'carrier' was laid low by the stroke, her 'fetcher' remained unscathed, able to get on with its job as usual. For 'carrying', you see, people --- real ones and dream ones --- have a speech-production system, but for 'fetching' they have a separate speech-comprehension system.[6]

That brings us back to the empty box labelled 'SPEECH-COMPREHENSION SYSTEM' in the diagram represented above. What would the functional architecture of the speech-*comprehension system look like*? A *'blueprint for the listener or hearer'* à la *Levelt* cannot be presented in any detail here. It is possible to identify on the basis of function, though, some of the macroscopic processing components that play a part in the comprehension of speech. These components include the following:

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- the **Perceptor**, which identifies certain noises as speech sounds;

- the **Recognizer**, which, on the basis of the perceived sounds and other cues, decides what words have been uttered;

- the **Parser**, which 'parses' a string of words by assigning it an internal organization or a syntactic structure;

- the **Interpreter**, which assigns a parsed string of words an interpretation on the joint basis, firstly, of the meaning of the individual words and, secondly, of the relations holding among the words;

- the **Understander**, by whose working the interpretation of a parsed string of words is meshed with information from various other sources of meaning.

Drawing on information furnished in par. 3.3.1.2, the characterization of these processing components is at best suggestive. Different scholars working in the area of language comprehension will partition the various processing activities differently, thereby proposing different fuctional architectures for the speech-comprehension system.[7]

4.1.2 Nature and location

(*In which the White Knight talks right on head downwards*)

Even someone as argumentative as Humpty Dumpty would find it hard to deny that normal people have a speech-production system and a speech-comprehension system. But where do they have them?

A first, obvious response would be: 'inside the person's body'. Clearly, it might be argued, to produce the sounds of spoken utterances, a speaker uses his/her vocal tract. This tract is made up of certain organs (e.g., the lungs), muscles (e.g. those used for breathing), bony structures (e.g. the voice box), cavities (e.g. those of the nose and mouth), and so on; clearly, therefore, the vocal tract is something physical. And similar things might be said about the processing involved in the perception of utterances. For example, to perceive spoken utterances, a hearer/listener uses his/her auditory system: a system whose component parts are to be found in the outer, middle and inner ear, in the brain stem and in the brain itself. And all this, surely, means that the speech system is something 'bodily' too --- so the first response might conclude.[8]

But the first response won't do. To see why, think for example about the processing involved in conceptualizing and formulating in the case of speech production. Think, too, about the processing involved in parsing, interpreting and understanding, in the case of speech comprehension. The former processing, although it is 'productive', obviously does not take place in the vocal tract. Nor can the latter processing, which is 'comprehensive', be located in the auditory system.

But what about the brain? Surely the brain is the place where conceptualizing, formulating, parsing, interpreting and understanding take place? Surely, therefore, like the brain, these processes are physical too? Think, for example, of the fate of the Queen of Hearts. Surely the stroke affected a part of her brain; surely it was as a consequence of the stroke that she could no longer 'find the right words'? Surely this goes to show that the processing involved in 'finding the right words' is something physical --- indeed, to be more specific, something neurological.

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Not quite. In the above line of argument an important distinction is overlooked, one illustrated in an amusing conversation that Alice had with the White Knight. A poor rider, the White Knight keeps falling off his horse --- to the front, to the rear, to the sides. But being made of sturdy stuff, he never lets himself be unduly upset by these *frequent unsaddlings. Having tumbled headlong into a deep ditch on one occasion,* for example, he goes straight on talking to Alice in his usual tone of voice. Feeling understandably baffled, she cannot resist asking him 'How *can* you go on talking so quietly head downwards?' The Knight looks surprised by Alice's question, and here is what he replies:

> 'What does it matter where my body happens to be?
> ... My mind goes on working all the same. In fact the more head downwards I am, the more I keep inventing new things.' [*TLG* 304]

Though without a shadow of doubt a poor rider, the White Knight deserves credit not only for being a good talker, but also for having a good intuitive understanding of what talking involves: one talks with one's mind more than with one's body. That is, the processes involved in talking take place mostly in the speaker's mind. They are mental processes. The same is true of many of the processes involved in speech comprehension.

But what is one's mind supposed to be? On a widely held view, the **mind** is a symbolic system. The mind can construct symbols; and the mind can manipulate symbols in various thought or cognitive processes. **Mental symbols** or clusters of mental symbols serve to represent perceptions, ideas, beliefs, images, memories and so on. Collectively, the mental symbols that represent some perception, idea or the like form a **mental representation** of it. A **mental process** --- in particular a thought or **cognitive process** --- transforms one mental representation into another one. Conceptualizing,

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formulating, parsing, interpreting and understanding are typical instances of mental processes that transform certain mental representations into certain other mental representations.[9]

But what, then, is the mind as opposed to the brain? The mind and the brain are two sides of the same coin. To talk about the mind is to talk at an abstract level about something functional: something that does such things as thinking, imagining, perceiving, speech processing, and so on. To talk about the brain is to talk at a concrete level about something physical in which this functional something is 'realized'. Obviously the functions the mind performs depend on the brain's physical mechanisms; if the brain's mechanisms are injured, the mind's functions are impaired too. This is illustrated by the Queen's inability to 'find the right words' following the injury to her brain by the stroke. The relation between the mind and the brain has been compared by some scholars to the relation between a computer program on the one hand and a computer on the other hand. (The computer program --- a bit of 'software' --- contains a complex set of instructions for carrying out specific tasks. The computer --- a piece of 'hardware' --- is the physical machinery that executes/runs the program and thereby actually performs the tasks.) This comparison forms the basis of what has come to be known as the **computer model of the mind**. On this model, the basic idea is that the mind is the brain's computer program.[10]

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4.1.3 Features of the dynamics

(In which the Executioner turns role model)

Having considered in outline the functional architecture of the speech-production system and of the speech-perception system, we turn next to the dynamics of speech processing. Within our macroscopic perspective, we are interested in the general

features of the processing that people engage in as they produce or comprehend spoken utterances.

4.1.3.1 Functional specialization

(*On the prospects of doing beheadings as a sideline*)

Neither in Wonderland nor in Looking-Glass Country will you find a gardener doing beheadings as a sideline, an executioner dabbling in cooking, or a cook working after hours as a ticket collector. In both of these dream worlds, such important offices are left to specialists to discharge: to an experienced Executioner, to two Footmen --- a fish and a frog --- in livery, to a ticket-collecting Guard, and so on. As for the few would-be all-rounders, such as the soldiers doing duty as arches in the croquet game, or the White King doubling as a judge in the Knave's trial, they are spectacularly unsuccessful at their unfamiliar jobs.

In the processing of speech, the same generally holds true. Much of what happens in the production or comprehension of utterances is done by specialist processes (or processors), not by general-purpose ones. It is not the case, for example, that both linguistic noise --- such as that produced in uttering *The scared Knave's teeth chattered uncontrollably* --- and nonlinguistic noise --- such as that made by the uncontrollable chattering of the scared Knave's teeth --- are processed by the same all-purpose perceptual mechanisms. Rather, there is a specialist processor that is responsible for perceiving linguistic noise, that is, for perceiving the signals of spoken utterances.

The point under discussion may be illustrated with reference to the production of utterances too. In grammatical encoding --- the 'translation' of preverbal messages into structured strings of words --- cognitive processes such as those used in general problem-solving play no part. Data about language pathologies such as anomia indicate,

for example, that the process responsible for the selection of the 'right' words is so specialised that its task cannot be successfully taken over by some general process. And the fact that the specialised process can be impaired by a stroke that leaves other productive processes unaffected is further evidence of the specialised nature of this process.

Indeed, nearly all the processes involved in speech production or perception are **functionally specialized**: they do (and can do) one, specialized, thing only. And the majority of these processes are **domain-specific**: they affect (and can affect) things of a specific kind only. Among the processes involved in speech production or perception, there appear to be only a few nonspecialist ones. For instance, (some of) the processes involved in the conceptualization of preverbal messages are believed to be involved in cognition in general.[11]

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4.2.3.2 Autonomy

(*On why the King couldn't get anybody beheaded*)

When you come to think of it, the Executioner is a professional through and through. Not only is the nature of his job of a highly specialist sort; he also acts in a highly constrained way. He uses his axe only, remember, on those luckless Wonderlanders that are referred to him by the White Queen; as for the King's candidates for beheading, he consistently refuses to do anything about them. What is more, you won't catch the Executioner listening to advice from the Cook or asking assistance from the White Rabbit prosecutor when he has to deal with a particularly tricky assignment. Such as beheading the Cheshire Cat after its body has already vanished. No, when there is work to be done, the Executioner, self-reliant, acts very much on his own.

A similarly constrained functioning marks the specialist processes involved in the production and comprehension of utterances. Take, for example, grammatical encoding, (the family of) those specialist processes that 'translate' preverbal messages *into syntactic phrases and clauses*. Firstly, grammatical encoding operates on nothing but (chunks of) preverbal messages. Secondly, in building appropriate syntactic phrases, grammatical encoding requires no information other than that contained in preverbal messages. Thirdly, in building such phrases, grammatical encoding does not use aid from other processes involved in the production of utterances. These three features manifest a general property of grammatical encoding: it is an **autonomous** process. So is phonological encoding, to mention a second example. Phonological encoding takes, as its exclusive input, the surface syntactic phrases built by grammatical encoding. And, solely on the basis of the information conveyed by the properties of these phrases, phonological encoding produces as its output a phonetic plan that has to be implemented in articulating the utterance (or utterance fragment). This kind of autonomy is considered to be characteristic of many of the processes involved in speech production and speech perception.

If the input of some process (or system of processes) is maximally restricted, and if the operation of that process (or system of processes) is minimally affected by the output of other (systems of) processes, the process (or system) is said to be 'informationally encapsulated'. Grammatical encoding, phonological encoding and various other processes involved in the production or comprehension of utterances are believed to have this complex property of **informational encapsulation**. To put it in terms of an image from the world of work: jobwise, these processes --- much like the Executioner --- are blinkered loners.[12]

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4.1.3.3 Automaticity

(*Of the Dormouse's sleeping habits*)

In Wonderland, the social calendar provides for far more than chaotic sporting events and public executions. It also involves, for instance, the Mad Teaparty, thrown by the Hatter --- the event at which Alice first met the Dormouse. More squirrel than mouse, this fellow has the annoying habit of constantly dropping off to sleep. To wake it up, the Hatter and the March Hare have to do such unpleasant things to the Dormouse as pinching it or pouring hot tea on to its nose. And they abuse the Dormouse further by resting their elbows on it and by trying to put it into the teapot. But none of this has much effect on the Dormouse's behaviour for, as it says --- in its sleep, of course ---

> 'I breathe when I sleep' is the same thing as 'I sleep when I breathe'. [*AIW* 95]

Indeed, falling asleep and breathing are in an important sense the same kind of thing to the Dormouse: it doesn't have much conscious control over either. Just as it breathes automatically, so it sleeps automatically.

Some of the processes involved in the production and comprehension of utterances have the property of being **automatic** too. That is to say, these processes are not under the language user's central or executive control. A speaker-listener does not intend to perform these processes, nor is he consciously aware that they are taking place. In the case of speech production, the processes of grammatical encoding, phonological encoding and articulating are cases in point; in the case of speech comprehension, so is parsing. For example, in producing an utterance of the sentence *The Hatter offered Alice a cup of tea* or *The Hatter gave a cup of tea to Alice*, the speaker does not consciously decide to use an indirect object (*Alice*) or an oblique object (*to Alice*) for encoding the recipient of GIVE grammatically. Nor will he/she be aware of selecting the word *cup* for denoting the artefact in question.

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Some of the processing that takes place in speaking is highly controlled. For example, the conceptualizing involved in the planning and construction of preverbal messages requires speakers to make various kinds of conscious choices. Let us note here just three such kinds of conscious choices. Firstly, speakers often have to decide deliberately which items of information to include and which to leave out. Secondly, they usually have to reflect on the best logical structure by which to represent the items included in a certain message. Thirdly, they often have to reflect on the best way in which to develop a certain train of thought. (The Duchess has an intuitive understanding of the non-automatic nature of conceptualizing as opposed to the automatic nature of articulating, an understanding captured in her moral 'Take care of the sense and the sounds will take care of themselves' [*AIW* 121].)

Monitoring represents another (system of) process(es) requiring a speaker to pay conscious attention to his/her internal or overt speech. Errors are normally detected and repaired almost instinctively. But in certain cases, speakers have to ponder the nature of a particular error and the best way to repair it. Fortunately for the majority of speakers, they are unlikely to agonize over errors in the same way as the King of Hearts. For example, having incorrectly labelled as 'important' a piece of evidence given by Alice at the Knave's trial, the King tries to repair his error in the following floundering fashion:

> '"*Un*important, of course, I meant", ... and went on in an undertone, "important --- unimportant --- unimportant --- important ---" as if he were trying which word sounded best.' [*AIW* 155]

Returning to automatic processes, let us note that they are typically characterised by a number of other interesting properties, to be considered directly below.[13]

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4.1.3.4 Mandatoriness

(In which Alice tries to blot out the Queen's shrieks)

Automatic processes are mandatory too. To see what this involves, consider the following problem experienced by Alice, a problem which you unfortunately won't find mentioned in any officially published account of Alice's adventures. Towards the end of the croquet game, she gets so fed up with the way the Queen repeatedly shrieks *Off with her head!* that she can't bear the thought of having to hear the wretched phrase even one more time. Since she doesn't want to leave the scene of the action, Alice desperately thinks of means of blotting out the Queen's shrieks. She tries the obvious thing, sticking her fingers in her ears; it doesn't really work, though, the Queen's voice being so shrill. And Alice tries to concentrate hard on listening to something else, including the heated argument between the King and the Executioner about the possibility of beheading the already bodiless Cat. But still she can hear the Queen shouting *Off with her head!*

The real problem, you see, is that Alice is unable to switch off the processes involved in her speech-processing system. Nor can she will herself to hear the utterance *Off with her head!* as meaningless nonlinguistic noise. The automatic processes involved in the comprehension of speech are, as you may have guessed by now, **mandatory**: whenever people hear an utterance of a sentence in a language they know, they simply cannot help hearing it as an utterance of that sentence.[14]

4.1.3.5 Dumbness

(On helping oneself to a clean cup at a Mad Teaparty)

Normally, being automatic makes a process dumb as well. But what kind of dumbness are we talking about here? A clue to the answer may be found in what happens in the course of the Mad Teaparty when the Hatter decides that he needs a clean cup:

> '"I want a clean cup", interrupted the Hatter: "let's all move one place on."
> He moved on as he spoke, and the Dormouse followed him: the March Hare moved into the Dormouse's place, and Alice rather unwittingly took the place of the March Hare. The Hatter was the only one who got any advantage from the change; and Alice was a good deal worse off than before, as the March Hare had just upset the milk-jug into his plate.' [*AIW* 102]

The way in which Alice, the March Hare and the Dormouse behave here is quite interesting. Note that, though they could each move on by say, four, places, instead they do a highly 'local' thing in each moving on by one place only; that they move on blindly without considering how they will be affected by their action; that they (specifically Alice) are confronted with problems caused by their blind action. One could therefore say that in this scene, Alice, the March Hare and the Dormouse are acting in a dumb way.

Certain processes involved in speech processing, notably parsing, are viewed as dumb or 'deeply unintelligent' in a related way. On this view, the Parser processes an utterance such as *The Cat sat on a branch for a while* by examining the words of the uttered sentence one after the other as they are received. And, in working out the constituent structure of the sentence, it responds to each word in a specific, local, way: it tries to link a word up directly with the immediately preceding word. *Cat*, for example, is linked up with *The* to form the bigger constituent *The Cat*. Often, however,

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this deliberately simple-minded way of analyzing (the sentence underlying) an utterance gives wrong results: for example, when *sat* is directly linked up with *Cat*. The candidate constituent *Cat sat* is simply not one of the real constituents of the utterance *The Cat sat on a branch for a while*. If the Parser did its work in a 'smarter' way, it would act more like a good detective: it would examine the whole of the utterance for clues about its constituent structure. Only after trying to look at all the evidence would it offer its candidate analysis of what this whole structure might be. In other words, it would be analyzing in a global way. Trying to look at all the evidence, a 'global' Parser would try to test each candidate constituent by first working out the consequences of accepting it. This kind of check-up on direct link-ups, for example, would help to rule out misanalyses such as the *Cat sat* one. But a 'local' Parser, by contrast, assigns structures non-inferentially in a left-to-right way. This represents what has been called a 'rigid follow-the-cookbook approach' to syntactic parsing.[15]

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4.1.3.6 Fastness

(Of a truly fast kind of fastness)

Processes that are automatic are also fast. Being dumb, such processes do not spend time on making inferences or choices. In the words of Jerry Fodor, 'what you save by indulging in this sort of stupidity is ... *having to make up your mind*'; after all, 'making your mind up takes time'. This makes these processes really fast, unlike the actions of the White Knight. Though he boasted that he was capable of 'all kinds of fastness', he could in fact act with a slow kind of fastness only. (Once, for instance, it took him hours and hours to get out of his cone-shaped hat. He had clumsily fallen into his hat, head first of course, while wearing it [*TLG* 302-303].)

But to return to automatic, fast processes in speakers' minds. Though speakers have to select words from a huge mental stock, the selection process is so rapid that speech is

normally produced at a rate of two to three words per second. And articulation takes place extremely fast too --- at a speed of about fifteen speech sounds or four syllables per second. On the comprehension side, the processes of perception, recognition and parsing are similarly fast. In fact, identifying sentences is considered to be one of the very fastest of psychological processes. Even infants have the ability to recognize linguistic differences in less than a single second. For example, it has been discovered recently that babies between two and three months respond to subtle phonetic differences in under 400 milliseconds.[16]

4.1.3.7 Incrementality

(In which the Cheshire Cat does three things all at once)

Automatic processes share yet another property; they can work in parallel. To see what this means, let us renew our acquaintance with the Cheshire Cat. Now, a cat that could grin would surely be something special. So, too, would one that could speak. Not to mention one that could vanish at will, disappearing from the tip of its tail to the mouth in its head. But none of these three cats would be half as remarkable as the Cheshire Cat which --- as witnessed by Alice [*AIW* 91] --- could at once grin, speak and slowly disappear. If we were to think of grinning, speaking and disappearing as involving (clusters of) processes, we could say that the Cheshire Cat was able to engage in parallel processing. For, in parallel processing, various things are done at the same time.

If we consider the way in which the major processes involved in speaking are interlinked, we find the Cat to be an even more accomplished 'parallel processor'. How, then, are conceptualizing, formulating --- including grammatical and phonological encoding --- and articulating interlinked? Not in a simple serial way. That is, in producing an utterance such as *The Cat sat on a branch for a while*, a speaker

does not first construct the complete preverbal message to be communicated, then formulate a complete syntactic (surface) structure for the message, after that build the complete phonetic plan for the utterance, and finally articulate the whole utterance. If the four processes were to operate one after the other in this simple serial way, fluent speech would simply be impossible.

Rather, in the production of an utterance such as *The Cat sat on a branch for a while* the four major processes run parallel to each other, each one operating on a different fragment of the utterance. This means that the processing of an utterance is done **incrementally**, as is illustrated by the following figure:

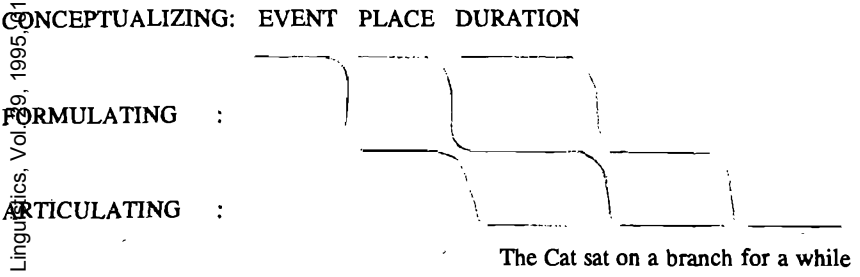

Figure 2: Incremental Processing

Let us see how this figure is to be understood. The speaker first conceptualizes an EVENT (the Cat's sitting at some point in time before the speaker's utterance), then the PLACE of the event (the sitting happened on a branch), and then the DURATION of the event (the sitting lasted a while). As soon as the first fragment of the message (the EVENT) has been conceptualized, it is put into words or formulated. While this takes place, the second fragment of the message (the PLACE) is being conceptualized. As soon as the EVENT fragment has been formulated as *The Cat sat*, it is articulated. While the EVENT fragment is being articulated, the PLACE fragment is getting

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formulated as *on a branch*. Simultaneously, the DURATION fragment is being conceptualized. While this third fragment of the message is being formulated as *for a while*, the phrase *on a branch* is already being articulated. And so on.[17]

From this simple example, it is clear that incremental processing is a combination of serial and parallel processing. Each fragment of an utterance is processed serially. That is, each fragment is processed in stages, starting with its being conceptualized, moving on to its being formulated and ending with its being articulated. The various processes, however, work in parallel. That is, they operate on different fragments of an utterance at one and the same time. Automatic processes are able to work in parallel like this because they do not share the same resources of attention, memory and so on.[18]

4.1.3.8 Modularity
(Of a tale told by Queenly symptoms)

Most of the features of language/speech processing considered above are basic in the sense that they are not made up out of other features. Combining serial and parallel operation in a particular way, incrementality, however, is an example of a nonbasic feature. So too is informational encapsulation. In the make-up of informational encapsulation, two more-basic features figure: (a) the input to a process/processor is of a maximally restricted sort, and (b) the mode of operation of a process/processor is minimally affected by the output of other components.

There is a third nonbasic feature that deserves special mention, namely **modularity**. A processing component or processor is considered a module if it is made up of automatic processes and if these component processes are informationally encapsulated. In addition to these two essential properties, modules tend to exhibit one or more other properties from the following cluster: they are functionally specialized and domain-

specific; their operation is mandatory; their operation is fast; they are innately specified; they are hardwired; they show highly characteristic and specific breakdown patterns.

To say that a modular processor is innately specified is to say that it is genetically given to the species and that it is only minimally shaped by any sort of learning process. To be hardwired is to be located in specialized neurological (brain) circuitry. And highly characteristic and specific breakdown patterns are caused by injury to such specialized neurological circuitry. The specific anomia suffered by the Queen of Hearts is an example of an impairment affecting a module. The Parser (in the comprehension system) and the Formulator (in the production system) are thought to be good candidates for modulehood.[19]

4.1.3.9 Computationality

(In which the Jury add up three dates and reduce the answer to shillings and pence)

The behaviour of the jury in the Knave's trial was quite remarkable, to say the least. On slates, the twelve jurors wrote down more or less everything that everybody said; then they went on to 'process' their scribbles in surprising ways. When the Hatter, the March Hare and the Dormouse disagreed about when the Hatter had begun his tea --- the fourteenth of March according to the Hatter, the fifteenth according to the March Hare, and the sixteenth according to the Dormouse --- the King ordered the jurors to 'write that down':

> '... and the jury eagerly wrote down all three dates on their slates, and then added them up and reduced the answer to shillings and pence.' [*AIW* 146]

What the jurors did with the three dates can be characterized metaphorically as follows: they took certain figures as their input; on these input figures they mechanically performed some step-by-step computations; by so doing, they produced an output that represented the input figures in a different way.

If computing is a rarely used form of processing in Wonderland, it is believed to be a quite general form of processing in the world of language. In particular, much of the processing done in the production and comprehension of utterances has been characterized as **computational**. Indeed, it may be argued that various features attributed in preceding paragraphs to processes of speech production and comprehension depend on these processes being of a computational sort. For example, it is hard to see how a process(or) could be informationally encapsulated if its business were not to compute something.

But what does it mean in the present context to say that a process(or) is 'computational'? In this context, 'computational' --- and the more basic 'computation' --- are technical concepts including much more than doing the simple kind of arithmetic at which the Jury excelled. The idea that (much of) speech processing is computational has to be understood within the perspective of a particular view of how the human mind works. On this view, the mind uses a small number of basic kinds of operations to transform (input) mental representations into other (output) mental representations. Such mental transformations are computational processes to the extent that they are carried out in a mechanical step-by-step way in accordance with certain 'rules' or principles.

Returning to speech processing: the processes involved in formulating and parsing are good examples of cognitive processes widely considered to be computational. By

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contrast, the physical processes involved in articulating and perception are considered noncomputational.[20]

4.1.4 Interfaces

(In which Alice runs out of both breath and memory)

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This brings us to two seemingly unrelated events that occurred in Looking-Glass Country:

First event

Towards the end of an amazing discussion, Alice and the Red Queen began somehow to run hand in hand through the chessboard landscape of Looking-Glass Country. The curious part of the thing was that, though they ran very fast, they never seemed to pass anything; which made Alice wonder if all the things were moving along with them. And, apparently able to guess Alice's thoughts, the Queen cried 'Faster! Don't try to talk!', advice that was superfluous, since --- as Lewis Carroll confides to his readers --- it was not

> '... that Alice had any idea of doing *that*.
>
> She felt as if she would never be able to talk again, she was getting so much out of breath ...' [*TLG* 209]

Second event

Asked by an anxious Alice what would happen if he did fall off the wall, Humpty Dumpty replied:

> '... all his horses and all his men ..... They'd pick me up again in a minute, *they* would. However, this conversation is going on a little too fast: let's go back to the last remark but one.'

A suggestion to which Alice responded very politely:

> 'I'm afraid I can't quite remember it'. [*TLG* 265]

These two events are not as unrelated as they seem to be, however: in both, Alice is battling with processing problems. In the first event, shortness of breath makes the production of utterances difficult. In the second event, shortness of memory lies at the root of the failure to recall an utterance. All in all, this illustrates an important general feature of speech processing: the two speech-processing systems interact with capacities and structures that are of a nonlinguistic sort, lung capacity and memory capacity being two cases in point. This is to say that, in speech processing, linguistic reality interfaces with various nonlinguistic realities, including a physical and a mental one. The world of language, clearly, is not a hermetically sealed domain.[21]

4.2 Knowledge of language
(On what it takes to speak Italics)

To be able to produce or comprehend utterances, obviously enough, one needs an unimpaired processing capacity. But one needs more than that, as Alice and the Emu discovered in Gilbert Adair's Needle's Eye World. It all happened when they tried *unsuccessfully* to speak to the Italian Hairdresser, a nervous individual. And an eccentric one: he used a small crocodile for trimming the tassle of the mortar-board worn by the whale-like professor called 'the Grampus'. (What was more, he seemed to use a caterpillar as a comb and an electric eel as a strop for sharpening his razors on.)

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To get the Hairdresser to shut up his crocodile-cum-scissors --- which kept on interrupting the Emu's political speech with cries of 'Hear, hear!' --- the Emu angrily and very sharply said to him: 'Another word from your crocodile, and I'll have it made into a travelling-bag!' But, in spite of the seriousness of this threat, the Hairdresser did nothing to silence the crocodile. For, as the Grampus tried to explain to the Emu:

> '"I'm afraid your - your - ... - your Emu-nence, I'm afraid he speaks nothing but Italics. However, I should be only too pleased to translate your kind observation, for I myself speak Italics, don't you know, though my command of it has got a little rusty of late ...' [TNE 53]

The problem, then, was that the Emu (and Alice) didn't speak Italics. Italics, if we are to believe Gilbert Adair, is a language which has a queer emphasis to it and about the pronunciation of which there is something sloping and not quite straight-up-and-down.

Now, in this context, what does it mean 'not to speak a language'? Clearly, it does not mean 'not to be using one's processing capacity at a given moment for producing utterances of the language'. Rather, as hinted at by the Grampus's use of the notion of the 'command of a language', *not to speak a language* here means 'not to know a language'. One's processing capacity for producing and comprehending utterances is of no use for producing or comprehending utterances in a language one does not know. That is, processing utterances in a language presupposes **knowledge of the language**.

But what does knowing a language involve? What is the general nature of knowledge of language? What are its main components and their properties? And how does knowledge of a language fit into the speech-production and speech-comprehension systems? It is with questions such as these that we will be concerned below.

4.2.1 General nature

(In which three distinctions are pressed into duty)

4.2.1.1 Knowledge of language versus ability to use language

(In which the Queen of Hearts gets shouting fit again)

You have perhaps been wondering whether someone's knowledge of a language is really distinct from his/her capacity or practical ability to produce and understand utterances in the language. Why can't knowledge of a language be regarded as the same as or at least as part of the capacity or ability to use a language? What indications are there that this is not so?

Once again the Queen's bad fortune can help us in the search for answers. Suppose that the stroke she suffered was a massive one that affected all her language centres, leaving her unable to say or understand anything. Suppose moreover that the Queen, like many stroke victims, was so fortunate as to make a complete recovery in the course of time: regaining her original ability to understand fully what others say; regaining, too, her ability to shout effortlessly things such as 'Off with her head!', 'Get cracking, Executioner!', and 'Give him a hand, Cook!'

While suffering from the effects of the massive stroke, the Queen had no ability or capacity to speak or understand English. If we identified knowledge of a language with the ability or capacity to use the language, we would have to believe that during this period the Queen had no knowledge of English whatsoever. What is more, we would have to believe that the Queen mysteriously 're-mastered' English from scratch in an amazingly short time. Scholars, however, judge these beliefs to be unfounded and far-fetched. So the only alternative is to take the view that the Queen's stroke, while having completely impaired her ability to speak and understand English, left her knowledge of the language intact. To take this view is, of course, to assume that

knowledge of language on the one hand and the ability to produce and understand utterances on the other hand are distinct language capacities.

This view is supported by another kind of indication as well. Thus, two people may know their language equally well, yet differ markedly in their ability to use it: the one blessed with the gift of the gab, the other continually tripping over his/her tongue. Even in Wonderland we find individuals differing strikingly in their ability to use language, the fluent March Hare and the faltering Hatter being cases in point. One and the same person, moreover, can on some days be less fluent that on others, humming and hawing on 'bad' days much more than on 'good' ones. By taking special lessons, people can even improve their ability to speak, without thereby increasing their knowledge of their language. Observations such as these indicate that people's ability to use language varies, but that their knowledge of language is fixed. As for its general nature, then, knowledge of language is not a capacity or an ability to do something.[22]

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4.2.1.2 Knowledge of language versus language use

(*In which Alice doesn't manage to add up nine ones*)

The fact that someone knows a language is obviously reflected by his/her using it to produce, understand and judge utterances. The Grampus's claim that he knew Italics was borne out, for example, by the fact that he was able to translate the Emu's English utterance 'Another word from your crocodile, and I will have it made into a travelling-bag!' into the Italics utterance *'Another word from your crocodile, and I'll have it made into a travelling-bag!'* And the claim that the Italian Hairdresser spoke Italics was confirmed by the upset way in which he reacted to this Italics utterance:

> 'Since the Hairdresser could hardly go paler than he already was, he turned crimson instead. Then, with many embarrassed bows in the Emu's direction, he

> hastily removed the eel off his shoulder and wrapped it round the Crocodile's jaws, tying it into a tight knot with an elaborate bow on top.' [*TNE* 54-55]

To claim that people's use of their language shows that they know the language is clearly not, however, to claim that their use of the language and their knowledge of the language are one and the same thing. On the one hand, using one's language presupposes knowledge of it. On the other hand, one continues to know one's language even when one does not or cannot use it, as is the case when one is (naturally) asleep or (artificially) anaesthetized or (alas) dead drunk. (The Dormouse is exceptional in that it did everything in its sleep, speaking included. It had to, in fact, since it was seldom fully awake!)

What one knows is often not accurately reflected by what one does. This important point was being completely missed by the two Queens when they tried to test Alice's knowledge of arithmetic:

> '"Can you do Addition?" the White Queen asked.
>
> "What's one and one and one and one and one and one and one and one and one?"
>
> "I don't know", said Alice. "I lost count."
>
> "She can't do Addition," the Red Queen interrupted.' [*TLG* 320]

The Red Queen's diagnosis of the cause of Alice's problem was, of course, wrong. The problem was not that Alice's knowledge of arithmetic was inadequate for doing the simple addition required by the White Queen's sum. On the contrary, the problem lay with Alice's memory capacity. She simply couldn't remember how many times --- eight in all --- she had to add a one to the other number concerned. People's knowledge of arithmetic is far from being the only factor to determine how well they do their

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addition sums. In short, people's arithmetical performance does not directly reflect their arithmetical competence.

An analogous situation holds in the world of language. A speaker-hearer's knowledge of language --- called **linguistic competence** by Noam Chomsky --- is only one of the factors determining his/her language behaviour or use --- called by Chomsky **linguistic performance**. Various other factors play a part in a speaker-hearer's linguistic performance: factors such as memory limitations, shifts of attention and interest, random distractions, state of health, fatigue, sobriety and so on. Linguistic performance, accordingly, does not directly reflect linguistic competence. This in turn means, amongst other things, that errors of performance do not necessarily point to limitations of competence. When Alice said to the Country Mouse 'No, it don't .....', for instance, the unacceptability of this utterance did not indicate a flaw or gap in her knowledge of English. The cause of Alice's error was nonlinguistic: the demands of the moment were too much for her powers of concentration. On the one hand, you see, she was amused by the curious logic and funny accent of the Cockney-speaking Mouse; Alice, it maintained, was Halley's comet that had fallen into its haystack. On the other hand, Alice's sense of etiquette strictly forbade her to laugh in the Country Mouse's face. And so she had to concentrate almost all her attention on fighting the laughter down.[23]

4.2.1.3 Knowledge of language versus knowledge about language

(Of words that have a temper)

Various Carrollinian characters appear to be quite knowledgeable about their language, discoursing in a learned way on its parts and properties. Humpty Dumpty, for example, had distinct views on the nature of names, insisting that they must mean something, as his own did:

> '"... *my* name means the shape I am --- and a good handsome shape, it is too. With a name like your's [i.e., *Alice*] you might be any shape."' [*TLG* 263]

And, to cite one more example, Humpty seemed to know a lot about the properties of the various classes of words too:

> '"They've a temper, some of them - particularly verbs: they're the proudest - *adjectives you can do anything with*, but not verbs - however, I can manage the whole lot of them!"' [*TLG* 269]

That a name must mean something, that words have a temper, that the proudest words are the verbs, that one can do anything with adjectives: all these represent bits of Humpty Dumpty's **knowledge about language**. He also had **knowledge of language**, however, specifically knowledge of English: the knowledge that enabled him to speak and understand English and to judge intuitively the utterances produced by Alice.

It is crucial to distinguish between a speaker-hearer's knowledge of his/her language and his/her knowledge about (this) language. All normal speaker-hearers have knowledge of their language, the knowledge they require for producing, comprehending and judging utterances. This knowledge is not conscious. It is a form of **tacit** or **implicit knowledge**, about which ordinary speaker-hearers --- that is, linguistically untrained ones --- cannot make claims couched in technical terms like 'verb', 'noun', and so on. Moreover, what ordinary speaker-hearers tacitly know of their language cannot be false. Knowledge of language, consequently, cannot be a form of scientific knowledge.

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As for knowledge about language, such knowledge is a form of **conscious knowledge** and is not presupposed by the use of language. It is restricted, moreover, to linguistically trained or reflective speaker-hearers. And the claims expressing bits of (potential) knowledge about language can turn out to be false --- that is, if they can be tested. The claims made by linguists about (a) language are scientific to the extent that they can be tested. For all his cleverness, Humpty Dumpty would fare wretchedly as a linguist, making, as he does, far too many claims about language that cannot be tested. How would one set about checking his claim, for example, that words have a temper or that verbs are the proudest?[24]

Tying in with the fact that knowledge of language is not scientific knowledge is the fact that knowledge of language is not justified or grounded knowledge. The beliefs involved in knowledge of language are beliefs which speaker-hearers cannot justify by providing good reasons for them. In terms of Alice's knowledge of English, for example, the word *glory* could not mean 'There's a nice knock-down argument for you', the sense in which Humpty Dumpty used it [*TLG* 268-269]. Nor, in terms of Alice's knowledge of English, could the word *impenetrability* have the Dumptian meaning 'We've had enough of that subject, and it would be just as well you'd mention what you mean to do next, as I suppose you don't mean to stop here all the rest of your life' [*TLG* 269]. Yet Alice was unable to justify her beliefs about the meaning of *glory* and *impenetrability*. And so she let Humpty Dumpty get away with the fanciful story that he could make words do a lot of additional work by paying them extra on Saturday nights when they came to get their wages.[25]

4.2.2 Componential make-up

(Of a linguistic Looking-Glass Garden)

So, knowledge of language is not the same thing as the ability to use language, nor is it actual language use, nor is it knowledge about language. What, then, is knowledge of language? One of the ways to arrive at an answer to this question is to do what Alice did when she wanted to get a better view of Looking-Glass Garden. She went to the top of a hill (by walking away from it!), which enabled her to look in all directions. This afforded her a bird's-eye view of 'a most curious country':

> 'There were a number of tiny little brooks running straight across it from side to side, and the ground between was divided up into squares by a number of little green hedges, that reached from brook to brook.' [*TLG* 207]

So, when Alice looked down on it from this distance, Looking-Glass Garden --- which in fact covered all of Looking-Glass Country --- turned out not to be an undivided whole: it was made up of blocks, like a chessboard (which in fact it was, as Alice soon realized).

But this is the general picture that one also gets of knowledge of language (or linguistic competence) when one surveys it from a suitable distance through a macroscope. In the macroscopic perspective, knowledge of language is seen not to be a homogeneous, undivided whole. Rather, it is made up of distinct blocks or components. Below, we will consider the three principal ones: grammatical competence, pragmatic competence, and a conceptual system.[26]

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4.2.2.1 Grammatical competence
(In which the Rules of Battle are reconstructed)

A speaker-hearer's **grammatical competence** --- or **knowledge of grammar** or **mental grammar** --- is his/her tacit knowledge of form and meaning and of the way in which they hang together in his language. What this means may be illustrated with reference to the following snatch of (Mad Tea-Party) conversation (triggered by the Hatter's riddle 'Why is a raven like a writing-desk?'):

> '"Do you mean that you can find out the answer to it?" said the March Hare.
> "Exactly so," said Alice.
> "Then you should say what you mean," the March Hare went on.
> "I do," Alice hastily replied; "at least - at least I mean what I say - that's the same thing, you know."
> "Not the same thing a bit!" said the Hatter. "Why, you might just as well say that 'I see what I eat' is the same thing as 'I eat what I see'!"
> "You might just as well say," added the March Hare, "that 'I like what I get' is the same thing as 'I get what I like'!"
> "You might just as well say," added the Dormouse, which seemed to be talking in its sleep, "that 'I breathe when I sleep' is the same thing as 'I sleep when I breathe'!"' [*AIW* 95]

By virtue of their grammatical competence, speakers of English know such things as the following:

- Though made up of the same words, *I say what I mean* and *I mean what I say* do not mean nearly the same thing. *I mean what I say* and *What I say I mean*, however, do mean largely the same thing.

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- One can say *I like what I get* but not **I like when I get*. And one can say *I sleep when I breathe* but not **I sleep what I breathe*.

- One can say *I get what I like* but not **My get what I like*. Nor can one say **I gets what I likes*.

- One can ask the question *What do I like*? or *Who likes what I get*? but not **Who I like what get*? or **I like who what get*?

- One can say *I sleep when I breathe* but not **I slept when I breathe*.

- One can say *I say what I mean* but not **Say I what mean I*.

Someone who kept on taking pairs or utterances such as *I say what I mean* and *I mean what I say* to mean the same thing would not be considered grammatically competent in English. Nor would someone who regularly produced utterances such as **I like when I get* and the other ones that have been starred above. The bits of knowledge indirectly identified above are intended to be illustrative only: grammatical competence has many other ingredients.

Reduced to the essence, grammatical competence has two kinds of ingredients. As for the first, to be able to produce and understand utterances such as those used in the above illustration, speaker-hearers have to know the words or lexical items of the language: *I*, *say*, *mean*, *sleep*, *breathe*, *like*, *get*, *what*, *who*, *when* and so on.[27] Some people know the **lexical aspect** of their language better than others --- and some of these like to impress others with their superior lexical knowledge by using unusual or 'high-brow' words in the place of ordinary ones. As the Dodo did when he solemnly

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declared '*I move that the meeting adjourn, for the immediate adoption of more energetic remedies.* --- ' [*AIW* 47][28]

But grammatical competence has to include more than lexical knowledge. Thus, *I say what I mean* and *I mean what I say* are made up of the same words but, nevertheless, differ in meaning. And the two utterances --- or rather the sentences underlying the utterances --- differ in one other way only: the words are differently combined. This means that, to be able to produce and understand these utterances, speaker-hearers have to know how to combine words in different ways such that these ways convey different meanings or messages. That is, speaker-hearers' grammatical competence also has to include knowledge about the **combinatorial aspect** of their language.[27] Knowledge of the combinatorial aspect of language makes it possible for speakers to use a limited number of words for constructing an unlimited number of sentences. Grammatical competence in this sense, it has been claimed, allows people to make infinite use of finite means.[28]

Knowledge of the combinatorial aspect of language, then, forms the second basic ingredient of grammatical competence. Linguists often refer to this knowledge of speaker-hearers as their (tacit) knowledge of the **grammatical rules** of the language. Such rules --- of which there are various kinds --- are believed to play a crucial part in the encoding and decoding of meanings or messages. In addition, they form the basis of many of the intuitive linguistic judgements made by speaker-hearers. For example, **Say I what mean I* is intuitively judged to be ill-formed on the basis of a rule of English which informally says: 'A (declarative) sentence consists of a noun phrase followed by a verb phrase'. Judged on the basis of this rule, **Say I what mean I* is in fact doubly flawed: both *say I* and *mean I* violate this rule in that the respective main verbs (*say* and *mean*) precede the (subject) noun phrase (*I*).

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The idea that a competence involves knowledge of rules which govern action or behaviour is, of course, not an outlandish idea. Even in dream worlds such as Looking-Glass Country one has to know and follow rules in order to do things in the proper way. Like fighting a battle. Before the Red Knight and the White Knight start banging away at each other with a fury, they first agree to observe the Rules of Battle which they know implicitly. Watching the fighting, Alice tries to reconstruct some of the rules explicitly:

> '"One Rule seems to be, that if one Knight hits the other, he knocks *him off his* horse; and if he misses, he tumbles off himself - and another Rule seems to be that they hold their clubs with their arms, *as if they* were Punch and Judy ... " Another Rule of Battle ... seemed to be that they always fell on their heads ... ' [*TLG 295-296*]

Like these Rules of Battle, rules of grammar are known tacitly only. Ordinary speaker-hearers of English cannot explicitly state or consciously disregard a rule such as 'A sentence consists of a noun phrase followed by a verb phrase'. Grammatical rules should accordingly not be confused with the prescriptive rules that are hammered into the heads of some schoolchildren. Having survived five to ten years of such teaching, you can decide to stop following such prescriptive rules as 'Don't use double negatives' and *'Don't use in in the sense of into'*. But you cannot decide not to follow grammatical rules which you know unconsciously only. (The former prescription, incidentally, is wasted on the Gryphon; without batting an eyelid, he will say things such as *They never execute nobody* [*AIW* 125] and *He hasn't got no sorrow* [*AIW* 126].)

Grammatical competence, it is believed, is in a clear sense a special component of the world of language. To see what this means, we have to dwell for a moment on one of the striking features of Carrollinian dream worlds: the stunning diversity of inhabitants

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that can speak English. There are talking animals of all descriptions: from better known species such as cats, dogs and rabbits to the mythical unicorn and gryphon; assorted birds and even a bird(?)-to-be in the form of a talkative egg, the one and only Humpty Dumpty; water-loving creatures such as frogs, whales, lobsters and tortoises; argumentative caterpillars; soft-spoken insects and so on. (The Siamese-Twin Cats, Ping and Pang, even imagined that it is only in fairy-tales that human beings are also able to speak! [*TNE* 24-25]) Flowers talk even 'when there's anybody worth talking to' as Alice was told by a Tiger-lily [*TLG* 200].

But this, of course, is the kind of stuff that dreams are made of. In the real world, only humans can talk in the sense of being grammatically competent in one or more languages. Taking grammatical competence to be a **computational system**, Noam Chomsky has argued that it uniquely characterizes our species. In an early formulation, he (1972:100) puts the point as follows:

> 'When we study human language, we are approaching what some might call the "human essence", the distinctive qualities of mind that are, as far as we know, unique to man.'

'But what about such clever apes as the famous Sarah, Washoe, Lana, Koko and Nim (Chimsky)?' you may wonder. Haven't they been shown to be able to acquire and use English or American Sign Language? In the face of mounting evidence to the contrary, the early belief that this is the case has in fact been abandoned as overly optimistic. Higher apes may be capable of elementary forms of symbolic communication laboriously taught to them; they are incapable, though, of constructing an unbounded range of expressions. Highly trained chimps cannot do better than to 'utter' repetitively a restricted number of jumbled strings of 'words' or 'signs', strings such as *Me eat me eat, You me banana me banana you, Give orange me give eat orange me eat orange*

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give me eat orange give me you. (Small wonder that Lewis Carroll did not see his way clear to including simians in the cast of Alice's dreams!) Interestingly, people with severe language impairment --- that is, people who have lost both their grammatical competence and the capacity to acquire it afresh --- can still learn and use simple symbolic systems such as those taught to 'clever' apes. The reason, then, why grammatical competence, along with the capacity to acquire it, is accorded a special place in the world of language can now be clearly seen: the combination of this capacity and this competence simply sets humans apart from other species.[29]

Noam Chomsky, incidentally, is by no means the first leading scholar to have stressed the species-specificity of human language. This idea was strikingly expressed earlier by Bertrand Russell. The famous twentieth-century philosopher and mathematician put it like this:

> 'No matter how eloquently a dog may bark, he cannot tell you that his parents were poor but honest.'

And much, much earlier --- in the seventeenth century, as a matter of fact --- René Descartes, regarded by many as the father of modern philosophy, phrased the point as follows in Part V of his *Discourse on Method*:

> 'It is a very remarkable fact that there are none so depraved and stupid, without even excepting idiots, that they cannot arrange different words together forming of them a statement by which they make known their thoughts; while, on the other hand, there is no other animal, however perfect and fortunately circumstanced it may be, which can do the same'.

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4.2.2.2 Pragmatic competence
(On how to shut up noisy Daisies)

When speaking to fellow Dreamworlders, Alice is often unsure about the right way to say things. For example, about how to address the Mouse that she finds swimming in the pool of salt tears (wept earlier by herself when, for a while, she was nine feet high):

> '"Would it be of any use, now," thought Alice, "to speak to this mouse? Everything is so out-of-the-way down here, that I should think very likely it can talk: at any rate, there's no harm in trying." So she began: "O Mouse, do you know the way out of this pool? I am very tired of swimming about here, O Mouse!" (Alice thought this must be the right way of speaking to a mouse: she had never done such a thing before, but she remembered having seen, in her brother's Latin Grammar, "A mouse - of a mouse - to a mouse - a mouse - O mouse!"' [*AIW* 41]

And Alice often feels less than happy about the way in which others speak to her. The bluntness of the hookah-smoking Caterpillar, for example, is one such source of irritation to her:

> '"You!" said the Caterpillar contemptuously. "Who are *you*?"
>
> Which brought them back again to the beginning of the conversation. Alice felt a little irritated at the Caterpillar's making such *very* short remarks, and she drew herself up and said, very gravely, "I think you ought to tell me who *you* are, first." [*AIW* 68]

On closer inspection, there does not seem to be anything wrong with Alice's grammatical competence. And the same goes for that of the brusque Caterpillar. Their

problems lie in a different area: they get into trouble with using English appropriately. These problems reflect limitations of their pragmatic competence. Not knowing how to address somebody appropriately, opening a conversation with a stranger by asking the blunt question 'Who are *you*?', and insisting to be told first by the questioner who he/she is --- these are symptoms of pragmatic incompetence.

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But what is pragmatic competence in general terms? On an inclusive characterization, **pragmatic competence** is a speaker-hearer's tacit knowledge of the conditions governing the appropriate use of language. A particular linguistic form is used appropriately if it is the right means for making clear a particular intention of the speaker-hearer's or for serving a particular purpose of the speaker-hearer's. A blunt question such as 'Who are *you*?', evidently, is not an appropriate means for finding out the identity of a stranger and for establishing, at the same time, a basis for further interaction of a cordial and cooperative sort.

To get a clearer picture of what pragmatic competence is, let us consider some of the things known by a speaker-hearer who is able to use his/her language appropriately. Such a person tacitly knows, amongst other things, how

- ***to perform basic speech acts*** *such as making assertions, asking* questions, giving commands, making promises, conveying requests, issuing threats, and so on. Alice is quite competent in this last area, being able to shut up the noisy Daisies with the whispered *If you don't hold your tongues, I'll pick you*!, a threat which made several of the pink Daisies turn white. [*AIW* 202][30]

- **to use language cooperatively** by saying what is required by the purpose or direction of a conversation.[31] A speaker can even ask

questions in an uncooperative way, as Alice does when she asks the Cat a question without giving it enough information about how to answer the question. To her question, for instance, *Cheshire Puss, would you tell me, please, which way I ought to go from here*?, the Cat can only reply *That depends a good deal on where you want to get to.*[32] [*AIW* 88]

- **to mean more than he/she says**. For example, in response to Alice's impertinent *Oh, please mind what you are doing [when handling your baby]*, the Duchess says, seemingly irrelevantly, *If everybody minded their own business the world would go around a deal faster than it does*, whereby she means "Mind your own business" [*AIW* 84]. Metaphor, irony, sarcasm and so on are regularly used for meaning more than is said.[33]

- **to behave properly in conversations**: beginning and stopping to speak in the right way, correctly taking and yielding turns to speak, making repairs when necessary, not saying impolite or face-threatening things, and so on.[34] In this last area, Alice alas is rather naive. For example, in complaining about her size to the Caterpillar she says ... *three inches is such a wretched height to be*, thereby insulting the three-inch Caterpillar.[35]

- **to use language humorously** --- something at which the White King, for one, is no good. Thus, having asked the White Queen rhetorically '.... you *never had fits, my dear, I think*?', he goes on to say with a smile *Then the words don't fit you*'. The response to this pun says a lot about the King's pragmatic competence:

'There was a dead silence.

> "It's a pun!" the King added in an angry tone, and everybody laughed.' [*AIW* 160]
>
> Having to tell people that one has just made a linguistic joke is, sadly enough, an unmistakable symptom of pragmatic incompetence.

Some people can do more things with language than others can, having been trained to professionally perform such special speech acts as baptizing, marrying, knighting and sentencing other people. As may be expected, in Looking-Glass Country the conditions on successfully performing speech acts are rather more involved than they are in the real world of language. In the latter world, for example, passing a sentence presupposes that a verdict about an accused person's guilt has already been given. But in the mirror-image world, these two speech acts are performed in the reverse order. Thus, having made the unfunny pun on the word *fit*, the King hastily says, for about the twentieth time that day, *Let the jury consider their verdict* ... . To which the Queen responds *No, no! ... Sentence first - verdict afterwards.* All that Alice's outburst of outrage *Stuff and nonsense! .... The idea of having the sentence first!* gets her from the Queen is a waspish *Hold your tongue!* and the even more vicious *Off with her head!*

What is clear from this little bit of court-room drama is that, to be able to perform a speech act successfully, the speaker-hearer has to know and obey certain conditions on the kind of speech acts in question. These conditions do not apply to special kinds of speech acts such as passing sentences only. They apply also to the various kinds of basic speech acts, as is illustrated by the following bit of wayward conversation in the course of the Mad Teaparty:

> "Have some wine," the March Hare said in an encouraging tone.
>
> Alice looked all round the table, but there was nothing on it but tea. "I don't see any wine," she remarked.

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"There isn't any," said the March Hare.' [*AIW* 93-94]

In saying to Alice *Have some wine*, the March Hare acts insincerely: he knows that he is unable to deliver on his offer. In so doing, he violates the sincerity condition for offers. This condition, which holds for promises too, reads as follows: To carry out the speech act of promising sincerely, the promiser *must intend to carry out the act that* he/she promises to do.[36]

Note that pragmatic competence has been characterized above from the speaker's perspective. The ingredients of pragmatic competence have been illustrated with examples of what a pragmatically competent speaker tacitly knows about using his/her language appropriately. This choice of illustration has been made for expository reasons only: pragmatic competence is just as crucial to hearing (in the sense of comprehending) as it is to speaking. Appropriateness is just as much in the 'ear' of the hearer as it is in the 'tongue' of the speaker.[37]

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4.2.2.3 The conceptual system

(In which the walking speed of Nobody becomes an issue)

The third component of knowledge of language is, on Noam Chomsky's view, a **conceptual capacity** or **conceptual system**. This system permits us to perceive, to categorize, to symbolize and perhaps even to reason. Without the knowledge embodied in this system, speakers moreover would be unable to plan and put together preverbal messages. And hearers without such knowledge would be unable to recover and unpack such messages.

Linguists know much less about the conceptual system than about the other two components of knowledge of language. What will be said below about this system,

an action (normally) done to someone or an action (normally) done with the aid of something.

- specific things: The Cat --- and not Alice --- does the sitting. The sitting takes place on Alice's lap, and not on the Cat's, and so on.

For organizing preverbal messages such as the one under consideration, the conceptual system provides a range of **thematic roles**, including those of Agent, Patient, Instrument, Theme, Benefactive, Experiencer, Source, Goal and Location. In the message under consideration, the nature of the Cat's involvement in the sitting is made clear by conceptualizing the Cat as being the Agent. The connection between Alice's lap and the sitting, by contrast, is captured by representing Alice's lap conceptually as the Location. Thematic roles, accordingly, serve to structure preverbal messages by answering such questions as 'Who did what to whom?' and 'Why, where, when and how?'. Someone's conceptual system includes his/her tacit knowledge of how to structure preverbal messages in terms of thematic roles.[39]

Getting back to the higher apes of a paragraph ago, it is believed that chimpanzees may have parts of the conceptual system considered above. This would account for chimps' ability to communicate symbolically at an elementary level. Sarah, for example, was taught to manipulate tokens on a magnetized board, using and recognizing a mauve triangle as the symbol for 'apple', a red square as the symbol for 'banana', a pale blue star as the symbol for 'insert' and so on. But, though highly trained apes can understand simple symbolized messages such as 'if apple, then chocolate', we have seen above that they lack man's computational (linguistic) system. This is the system, let us recall, which allows people to form infinitely many expressions. When the computational system is linked to the conceptual system, we get, on Noam Chomsky's

view, the basis for free thought. This linking, he believes, forms the greatest step in human evolution, the step that has made humans unique.[40]

4.2.3 Location

(*In which it is all in the mind*)

But where could one look for the three components that make up knowledge of language? *In the mind*, Noam Chomsky argues. To him, to know a language is to be in a certain mental state. More specifically, he considers a speaker-hearer's knowledge of language to be the steady, attained state of a particular mental faculty: the **language faculty**. Knowledge of language on Chomsky's view, moreover, represents a particular kind of mental state: the kind that has a structure. So what does this mental structure consist of? On Chomsky's earlier view, of a system of rules and principles that generate mental representations of various types. We see then that, like the speech production and speech comprehension systems, knowledge of language is considered a mental or cognitive system. To gain a better understanding of the idea that knowledge of language is a mental state, we will in par 4.3 look a bit closer at what has been called above 'the language faculty'.[41]

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4.2.4 'Intuitive' interlude

(*In which the Queen's memory works both backwards and forwards*)

Unfinished as it is, our exploration of language capacities has already yielded a welcome spin-off: it has given us a better idea of the sources, origins or causes of intuitive linguistic judgements. About what the Dodo would grandly call the 'aetiology' of such judgements.

Grammatical competence, we have seen in par. 4.2.2.1, is a first of these sources. Thus, the utterance **Say I what mean I* is judged unacceptable because it --- or rather the sentence underlying it --- violates a particular grammatical rule of English.

Addressed by Alice to the White Queen, the question *Why is Your Majesty such a bitch?* would be unacceptable too. Not because it violates a rule of grammar, though. The unacceptability of this question springs, rather, from its breaking a constraint that forms part of people's pragmatic competence: the constraint requiring them to speak politely to their queen and/or king.

Neither a grammatical rule nor a pragmatic constraint, however, is violated by an utterance like *I can remember things before they happen.* Yet, this utterance is odd because it says something that is conceptually out of order. With the exception of the White Queen --- who has a memory that works both backwards and forwards --- people cannot conceptualize remembering as a process or state in which the mind has impressions of events that still have to happen. The oddness of this utterance springs from the fact that what it conveys clashes with a constraint forming part of people's conceptual system. Similarly, the utterance *Alice puts the Looking-Glass book* is odd because people cannot conceptualize an event of putting in which someone does not put something somewhere, or on something, or the like.

But what about the utterance *The cat the executioner the queen employed beheaded grinned*? Or *The King's horses galloped through the Queen's rose garden stumbled*? Speakers of English find utterances such as these two odd or unacceptable; yet neither violates a grammatical rule, a pragmatic constraint or a constraint of the conceptual system. Recall that, in par. 3.3.1.2, it was observed that comprehending these utterances requires very hard work. The judgement that these utterances are odd or unacceptable springs from the parsing problems that they cause speaker-hearers: it is

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hard to work out how the words are grouped into phrases because they are perceptually so complex. This means that the judgement that these utterances are odd has its source in speaker-hearers' speech-perception system.[42]

Which brings us to the general point: intuitive linguistic judgements can have one or more of various sources. These possible sources include a speaker-hearer's grammatical competence, *his/her pragmatic competence, his/her conceptual* system and his/her speech-comprehension system. If an utterance violates a rule or constraint in any of these linguistic capacities, it is intuitively judged **unacceptable.** To some unacceptable utterances linguists accord a special status: those utterances that are unacceptable because the sentences underlying them violate one or more grammatical rules or principles. These utterances --- or rather, to be exact, the sentences underlying them --- are regarded by linguists as **ungrammatical.**[43]

4.3 The language acquisition capacity
(*In which Alice tries to teach her cat Dinah to talk*)

Have you ever tried to teach your cat to talk? Well, Alice did, once. Before tumbling into Needle's Eye World --- you see --- she tried to teach Dinah, her cat, some basic English so that they 'might have some pleasant little discussions together' [*TNE* 4]. And, by using some unconventional means, she got Dinah to 'recite the alphabet':

> 'Clever Dinah mastered the vowels in no time at all - for, even if they came out in a tumble, and Alice couldn't be certain she heard each one distinctly, Dinah's maeiou-ing never failed to put them in the correct order. The consonants proved much harder, except for 'm', and a *very* pronounced 's' whenever Alice tweaked her tail ...' [*TNE* 5]

But in spite of Alice's ingenuity and her pupil's cleverness, Dinah's English didn't really get off the ground. According to Gilbert Adair, Dinah never learned one single word, showing no curiosity whatsoever in *Aardvark*, the first word in Alice's dictionary. And Alice's repeating over and over *The cat sat on the mat* left Dinah cold, even though sitting on a mat was exactly what Dinah did best in the world. Dinah's knowledge of English remained zero. Poor clever Dinah, of course, never had a chance, to begin with. Why not?

Knowledge of language presupposes a more fundamental capacity, the capacity to acquire such knowledge: the **language acquisition capacity**. This capacity --- Noam Chomsky claims --- is **species-specific**: it is restricted to human beings and, as such, forms the initial state of their language faculty. According to this claim, knowledge of language is something in the real wide-awake-world: something beyond the reach of all whizz-chimps, all clever cats and the like. The **language faculty** --- with its initial state and its final state --- is our capacity to acquire and use knowledge of language.[44]

In par. 4.2, we explored the final state of the language faculty, namely knowledge of language. Below, we will focus on the initial state of the language faculty --- that is, on the language acquisition capacity. In so doing, we will let ourselves be guided by two questions. Our first guiding question: What is the general nature of the language acquisition capacity? Our second guiding question: What are the specific properties of the language acquisition capacity?

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4.3.1 Innateness

(On what can(not) be learned languagewise from lullabies)

Many children grow up under less than ideal conditions --- yes, even children in dream worlds. Even in Wonderland, for example, we find the Duchess giving her baby a violent shake at the end of every line of a lullaby she sings to it. And these lines, as you may see for yourself, do not exactly ooze tender loving care:

'"Speak roughly to your little boy,
And beat him when he sneezes:
He only does it to annoy,
Because he knows it teases."'

'"I speak severely to my boy,
And beat him when he sneezes:
For he can thoroughly enjoy
The pepper when he pleases!"' [*AIW* 85]

Yet, cold-hearted as the Duchess may be, at least she speaks and sings to her baby. And from the way in which the baby howls, evidently the poor thing hears the Duchess loud and clear.

This means that the royal baby is better off than certain real-world children: children who have to grow up in complete linguistic isolation. These include children who are born deaf and children who are not spoken to at all by deranged parents, who may even punish their children for attempting to make linguistic noises of their own accord. The consequences of growing up under these subhuman conditions are severe: linguistically isolated children do not learn to speak in the natural way. From a human point of view,

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this is nothing short of tragic. From a linguistic point of view, at the same time, it is instructive: it shows that, in order to acquire its mother tongue in a natural way, a child has to be exposed to utterances of the language in question. The child's contact with the utterances of its mother tongue makes up its **linguistic experience**. And, collectively, the utterances to which the child has been so exposed form the **stimulus** for its acquisition of its mother tongue.

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Now, in view of two aspects of the child's linguistic experience, the knowledge of language acquired by it has a rather remarkable property. Let us zoom in on this remarkable property by considering those two aspects of the child's linguistic experience.[45] On the one hand, the child, throughout its linguistic experience, is exposed to numerous unacceptable utterances: slips of the tongue, unfinished utterances, utterances broken up by pauses, utterances consisting of no more than false starts, utterances with endings that do not match beginnings, utterances realizing ungrammatical or conceptually deviant sentences and so on. Not only Mad Hatters produce wayward utterances such as the following; normal people also do:

> 'I'm a poor man .... and most things twinkled after that - only the March Hare said -'
>
> 'After that .... I cut some more bread-and-butter -' [*AIW* 148-149]

Because the child is exposed to such deviant utterances, its linguistic experience forms an imperfect or **degenerate stimulus** for language acquisition. Somehow, nevertheless, children are not misled by the degeneracy of the stimulus: they do not unconsciously acquire rules for producing such unacceptable utterances as if these were the norm. Rather, in spite of the degeneracy of the stimulus, every normal child acquires the linguistic knowledge which enables it to produce acceptable utterances.[46]

On the other hand, the child's linguistic experience contains no evidence at all for certain bits of the knowledge of language acquired by it. This may be illustrated with reference to the English rule for forming simple questions such as 1b that are the *yes/no* questions corresponding to statements such as 1a:

1a *The Hatter is innocent.*

b *Is the Hatter innocent?*

In its very simplest form, the *yes/no* question rule reads as follows: 'Move *is* to the front of the sentence.' But such a rule won't do, of course; for it will give 2b, rather than 2c, as the *yes/no* question corresponding to 2a:

2a *The Hatter who is mad is innocent.*

b **Is the Hatter who mad is innocent?*

c *Is the Hatter who is mad innocent?*

This simplest form of the *yes/no* question rule expresses a structure-independent operation: it requires a scanning of the complex sentence to find one particular word, but pays no attention to the various structures into which the various words of that sentence enter. A less inadequate version of the rule would read as follows: 'Switch the subject noun phrase of the main clause (that is, the noun phrase occupying the first position within the main clause) and its auxiliary (that is, the verb in the second position of the main clause).' This formulation of the rule expresses a structure-dependent operation. To carry out a structure-dependent operation, attention must be paid to the way in which the words form larger units, known as 'phrases', and to the positions in which these phrases occur.[47]

Interestingly, in acquiring the right *yes/no* question rule, children do not produce unacceptable questions such as 2b. This means they do not use the simplest, structure-independent version of the rule. They seem to know that the correct question rule --- like syntactic rules in general --- is structure-dependent. But, significantly, this bit of information is not present in the utterances to which children are exposed, not even in the most sweetly sung lullabies. This means, then, that the stimulus is impoverished in this regard. That is to say, children acquire their language on the basis of an **impoverished stimulus**. But how on earth is it possible for children to acquire crucial bits of knowledge of their first language if there is no direct evidence for such knowledge in the stimulus?[48]

This is an important question. So let us consider another example of an unlearned ingredient of children's knowledge of language. Consider the following utterances:

3a *Alice ate the dry biscuit.*

b *Alice ate.*

4a *The Hatter is too upset to talk to the King.*

b *The Hatter is too upset to talk to.*

Utterance 3b is understood in the same way as utterance 3a. In both of the underlying sentences, *ate* takes an object denoting something that is eaten: a dry biscuit in the case of 3a, something unspecified in the case of 3b. But utterance 4b cannot be interpreted in the same simple way on the analogy of 4a. That is, utterance 4a means that the Hatter is so upset that he (the Hatter) cannot talk to the King. But utterance 4b, by contrast, means that the Hatter is so upset that someone (an arbitrary person) cannot talk to him (the Hatter). So, though superficially resembling 3a and 3b respectively, 4a and 4b are interpreted quite differently. And children know this: they unerringly

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interpret utterances such as these correctly. And yet, in their experience of English, there is no direct evidence to indicate this difference.[49]

Which brings us to the remarkable property of knowledge of language alluded to above: mother-tongue speaker-hearers know more about their language than they could have learned. Their knowledge of their native language includes important things for which there is simply no evidence in the degenerate and impoverished stimulus. Someone's knowledge of his/her first language is, in technical terms, underdetermined by his/her linguistic experience of his/her first language.

As Alice's partners at the Mad Tea Party could have pointed out to her, 'I know what I learn' is not the same thing as 'I learn what I know'. Had they been aware of the fact that the stimulus for first language acquisition is degenerate and impoverished, they could have unsettled poor Alice even worse. They could, for instance, have pointed out to her that 'I know what I have learned' is not the same thing as 'What I know, I have learned'. But how is it possible to know more than one has learned? Specifically, what might be the source of people's unlearned knowledge of their first language? Noam Chomsky's reply is that a significant part of this knowledge is innate: children are born with a sizable chunk of knowledge of language. The innate component of knowledge of language is made up of those aspects of knowledge of language for which there is no evidence in the child's stimulus for language acquisition. In fact, therefore, the child does not need to learn these aspects. Rather, the child is endowed with these aspects at birth. They collectively form the initial state of the child's language faculty. In short: the child's innate knowledge of human language serves to bridge the gap between its linguistic experience and that knowledge of language which makes up the steady or attained state of its language faculty.

From the point of view of its development in the child, knowledge of language is clearly made up of two components: an innate and an experiential one. The **experiential component** --- representing the evidence or data about its mother tongue --- allows the child to acquire a specific language. The **innate component** --- representing the child's linguistic endowment --- allows it to acquire any language as its mother tongue, on condition that the child has been sufficiently exposed to it. The experiential component, it should be stressed, both triggers and guides the process of the child's language acquisition. Even in dream worlds, after all, one would hardly expect to bump into toddlers who acquire language B (say, English) on the basis of exposure to utterances of language A (say, French).[50]

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4.3.2 Genetic determinedness

(Of the Diamonds' linguistic lot)

But in what sense can bits of knowledge of language be innate? To approach this question, let us consider something very curious that happened to the Duchess's baby soon after she had flung the howling child into Alice's arms. After a while, the little thing started to grunt, its nose became 'very turn-up' and its eyes got 'extremely small for a baby'. And after a while more, when Alice looked closely at it again, she saw that the baby had turned into a pig, something she accepted philosophically since 'If it had grown up .... it would have made a dreadfully ugly child: but it makes rather a handsome pig.' [*AIW* 87]

Babies turning into pigs, and people finding that quite unremarkable --- such is the stuff of dream worlds, we surely all agree. And why do we all agree? Because in the real world, the development of newborn individuals is governed by the genes inherited from their parents, genes that are characteristic of their species. The genetic make-up of a human baby determines, for example, that a small snub of a nose will develop into a

typical adult nose and not into a porcine snout. A baby doesn't have to learn how to develop an adult nose. Nor does it have to 'monitor' or 'manage' the development of such a nose. It inherits this nose as part of its genetic make-up. A baby is genetically endowed with an adult nose of a particular shape.

Humans, it is believed by Noam Chomsky and others, do not inherit physical features and capacities only. They inherit mental features and faculties too, including certain parts of their knowledge of language. Specifically, Chomsky believes that the initial state of the language faculty is innate in the sense that it forms part of the genetic make-up or genotype of humans. That is, certain bits of knowledge of language are directly encoded in people's genes. Under the triggering and stimulation of the child's linguistic experience, the initial state of the language faculty develops eventually into a state --- the "attained state" --- which represents the child's knowledge of his/her (first) language or (in other words) his/her mental grammar. On this view, language acquisition accordingly is not a learning process at all. It is rather a biological growth or maturation process. This is why people can know important parts of their language without having had to do what would be impossible anyway: to learn these parts on the basis of a degenerate and impoverished stimulus.

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The idea that important parts of knowledge of language are genetically determined and grow in a biological sense makes it possible to understand various aspects of first language acquisition. These include the following:

- Language acquisition is restricted to humans.
- People know more of their language than they could have learned.
- Any normal child can acquire any language as his/her mother tongue.
- A child acquires his/her first language faster than he/she can learn much simpler other systems such as arithmetical ones.

- Though acquiring their first language under widely different circumstances, children acquire their language at the same rate and in the process go through the same stages.
- First language acquisition neither requires nor benefits from conscious learning or deliberate teaching.

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It is impossible to understand these phenomena if it is assumed that a child acquires his/her mother tongue in the same way as he/she learns traffic rules, chess, history, arithmetic and so on. What is acquired in all these other cases depends to a great extent on what the child is offered in the way of learning material (that is, the stimulus), on the conscious efforts made by the child to learn the offered material, on the teaching skills of the child's instructors, on the child's motivation and general intellectual capacities and so on. Suppose, for instance, that the Mock Turtle and the Gryphon had to learn in their history (or, rather, 'Mystery') course when, how and by whom Wonderland had been first discovered. Suppose too that their lessons or textbooks offered no information on these matters. Under these circumstances they clearly could not learn a thing about the discovery of Wonderland; its *history*, to them, would truly remain a *mystery*. Yet, without having been offered any information on the structure-dependent nature of grammatical rules, children acquire the correct, but non-obvious rules such as the one for forming *yes/no* questions. In sum: the poverty and the degeneracy of the stimulus crucially affect 'ordinary' learning, but they have no effect on language acquisition. To the nature of 'ordinary' learning, we will turn in par. 4.3.3 below.[51]

We first have to consider something about the genetic basis of the language acquisition capacity that you may have been wondering about all along. To say that the language acquisition capacity is genetically based --- does this mean that there are such things as language genes? Or, as the question has also been phrased, are there among the roughly

100,000 human genes one or more that control grammar, genes that contain the instructions for the development of what has been metaphorically called the 'grammar organ'? No genes responsible for building this mental organ itself have so far been identified. But there is evidence to indicate that genes exist which build parts of the brain that control grammar. These genes affect the development of the neural circuitry or wiring --- made up of networks of multiply interconnected neurons or nerve cells --- that underlies parts of the mental grammar.

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When there is something wrong with the genes under consideration, the mental grammar is disrupted too. This is clear from the tragic history of the members of the House of Diamonds whose English offended the White Queen so much that she had them all taken care of by the Executioner. The Diamonds would say such grammatically ill-formed things as the following:

5 It's a quarrelling gardeners, they are.

6 The Cook remembered when she hurts herself the other day.

7 The Jury call the Queen because the King fall off the bench.

8 The Gardeners paint four rose.

9 Alice is swim in the pool of tears.

Though their intelligence was normal, the Diamonds frequently got their pronouns, plural suffixes, past tense suffixes and so on wrong. Deliberately planning their utterances, they spoke slowly, finding conversation hard work. The Diamonds suffered the hereditary --- that is, genetically-based --- language impairment known as Specific Language Impairment (SLI). Running in families, this condition indicates that genes exist whose effects are specific to the development of neural circuits that underlie certain parts of grammar.[52]

Genetically determined aspects of knowledge of language are by their very nature characteristic of the human species. This means that these aspects of knowledge of language are common to or shared by all humans. Genetically determined aspects of knowledge of language have accordingly been called **linguistic universals** by Noam Chomsky and his associates.[53]

4.3.3 Language-specificity

(*Of tales of yummy Chocolate Princesses*)

We have seen above that the language acquisition capacity is species-specific: it sets humans apart from cats, apes, pigs, and other kinds of creatures. This capacity, in addition, is **language-specific** --- in two ways.

To introduce you to the first of these ways I will let you in on something that Lewis Carroll kept away from his readers. The Duchess's pig-child (or child-pig, if you prefer) had a twin sister who didn't miraculously turn into a pig too. Rather, she grew up to become a talkative, elfin-faced girl. Called Chatterbox by the Duchess, she would tell stories such as the following to the Cook, to Alice or, for that matter, to anyone who cared to listen:

> 'This is a story about chocolates. Once upon a time, in Chocolate World there used to be a Chocolate Princess. She was such a yummy princess. She was on her chocolate throne and then some chocolate man came to see her. And the man bowed to her and he said these words to her. The man said to her, "Please, Princess Chocolate, I want you to see how I do my work. And it's hot outside in Chocolate World, and you might melt to the ground like melted butter. And if the sun changes to a different color, then the Chocolate World - and you -

won't melt. You can be saved if the sun changes to a different color. And if it doesn't change to a different color, you and Chocolate World are doomed."'

Chatterbox learned English in the normal way and became a fluent conversationalist. Strangely, though, she couldn't learn such simple ordinary things as tying her shoes, telling left from right, adding two numbers, making simple drawings and so on. With an IQ of about 50, Chatterbox was what is nowadays called a **linguistic idiot savant**: a good talker but a poor thinker. Linguistic idiot savants, thus, are in a sense opposites of sufferers of SLI who, we have seen, are (reasonably) good thinkers but poor talkers.[54] Linguistic idiot savants, too, show --- *and this is the interesting point here --- that people's language acquisition capacity is distinct from their capacity to learn other,* non-linguistic, things. On the one hand, the language acquisition capacity does not use general learning mechanisms, multi-purpose learning strategies or general problem solving techniques. Specifically, language is not acquired by using general principles of learning such as those embodied in association, abstraction, induction, hypothesis formation and so on. Recall that, in acquiring the *yes/no* question rule, children do not first try out the simple rule 'Move *is* to the front of the sentence'. Had language been acquired inductively, this would be the obvious rule to try out first. On the other hand, whatever principles are used in language acquisition, they are not used for the acquisition of non-linguistic things also. That is, the language acquisition capacity is a special-purpose mental capacity. Had this not been so, no linguistic idiot savants such as Chatterbox would be around.[55]

The first way in which people's language acquisition capacity is language-specific, then, concerns its distinctness from other, nonlinguistic, learning capacities. The second way involves the specificity of what has been called the 'constitutive principles' of this capacity. This can be illustrated with reference to utterances such as the following:

10a Each of the croquet players likes the others.

b The croquet players like each other.

11a Each of the croquet players expects the others to win.

b The croquet players expect each other to win.

In these pairs of utterances, it is clear, the expression *each ... the others* and the expression *each other* have the same meaning. But consider now the following pair of utterances:

12a Each of the croquet players expects Alice to beat the others.

b *The croquet players expect Alice to beat each other.

Speakers of English intuitively judge 12b to be unacceptable. But why? The conventional answer is that 12b violates a specific linguistic principle which (very) roughly says the following:

13 If (a) X and Y are explicit or understood components such as names, pronouns, anaphoric elements, etc.,

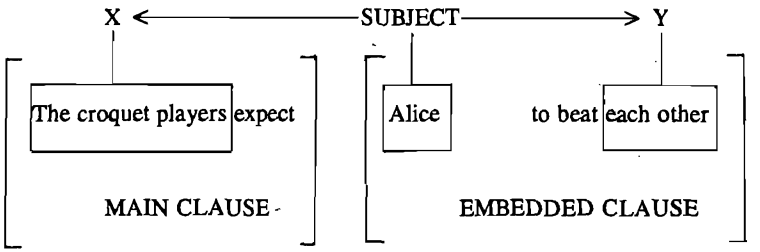
(b) X is a component of a main clause and Y is a component of a clause embedded in this main clause, and

(c) the embedded clause has a subject which is distinct from Y,

then X and Y cannot be linked by a linguistic rule.

The linking forbidden by 13 occurs in the case of 12b, as is clear from 14:

14



The linguistic principle 13 is an innate component of the knowledge which speakers have of English: they could not have acquired 13 on the basis of their linguistic experience. Moreover, 13 is specific to language in the sense that it does not derive from some more general principle of communication, cognition or perception or from any other nonlinguistic faculty.[56]

In sum: the language acquisition capacity --- or initial state of the language faculty --- is language-specific in two ways. It does not embody uniform multipurpose principles of learning, accommodation, assimilation, association, induction and so on. Nor are its constitutive principles derived from more general, nonlinguistic, principles. On account of its being language-specific in these two ways, the language acquisition capacity has been considered to be **modular**. That is, the language acquisition capacity is claimed to be a separate module of mind or (in other words) a separate cognitive system.[57]

4.3.4 Parameterization

(On how to write new Alice stories)

Suppose that a publisher (in a dream world!) offered you a fat fee for writing a new Alice story. How would you go about doing this? Well, if I were in your shoes, I would first want to get a good idea of the general features that characterize all the existing Alice stories in regard to content, structure, language and so on. And then I would want to know how these general features are manifested in the case of the various individual Alice stories. On this approach --- not a highly creative one, I hasten to admit --- each individual Alice story becomes a collection of variations on (or manifestations of) a limited number of themes (or general features).

Thus, all Alice stories begin by Alice dosing off and entering a dream world through some extraordinary kind of opening: a rabbit hole, a mirror, the eye of a needle. In every dream world, Alice meets an assortment of curious talking animals, birds, insects and plants, and also some members of the House of Cards. And in each of these worlds, Alice gets involved in strange social or public events: a croquet game, a trial, a chess game, a caucus race, an election and so on. In every dream world, moreover, Alice finds herself drawn into weird conversations that touch on deep logical, philosophical and linguistic ideas or questions. And Alice's fellow-conversationalists typically use linguistic devices such as punning, imposing their personal discipline on or control over language, emphasising the importance of names, using words to determine or control (patterns of) nonlinguistic events, breaking rules of normal conversation and so on.[58]

'But what has the general nature of Alice stories to do with language capacities?', you may rightly wonder. Well, these two things may seem utterly unlike at first sight. In fact, however, they lend themselves to a comparison. And the comparison can help us understand better how the innate principles embodied in speaker-hearers' language

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acquisition capacity (that is, in the initial state of the language faculty) relate to the rules making up speaker-hearers' grammatical competence (that is, a component of the attained steady state of the language faculty). This relationship, you see, is rather like that between the general themes characterizing all Alice stories and the specific variations on these themes found in the individual stories.

Here is a linguistic example to help clarify the point. One of the innate principles embodied in the language acquisition capacity reads (in a highly simplified form) as follows:

15 A phrase consists of a head word and, amongst other things, a number of smaller, role-bearing phrases.

In accordance with this principle, a verb phrase such as *gave the stolen tarts to Alice* (in a sentence such as *The Knave gave the stolen tarts to Alice*) consists of a head (verb) *gave*, a first smaller phrase *the stolen tarts* bearing the thematic role of Theme and a second smaller phrase *to Alice* bearing the thematic role of Beneficiary. Note that principle 15 does not state that the head (verb) *precedes* the role-bearing phrases. Why not? Because this is an English variation and, as such, has to be expressed by a rule of English grammar. Principle 15 holds for all human languages and, in some, the head (verb) *follows* the role-bearing phrases. In Japanese, for example, the verb phrase corresponding to *gave the stolen tarts to Alice* would be the literal equivalent of *the stolen tarts to Alice gave*. Japanese chooses the variation in which the head verb follows the role-bearing phrases, a fact expressed by a rule of Japanese grammar.

So 15 represents a simplified version of an innate, hence universal, linguistic principle or 'super-rule'. This principle has what is known as an open parameter concerning the order of the head relative to the role-bearing phrases in the verb phrase. The evidence

or data about English cause its native learners to fix this open parameter by choosing the 'head first' option or variation; the evidence or data about Japanese, in contrast, lead *its* native learners fix this parameter by choosing the 'head last' option or variation. Like all other languages, English and Japanese are thus structured in terms of the innate, universal principle 15. The two languages differ in the way in which they (and their native learners) set the open word-order parameter. And the different settings are reflected in differences between the rules of English and the rules of Japanese grammar. A rule of grammar, on this view, represents a parameter fixing or setting. And rules of grammar are, in a sense, derivative entities or 'epiphenomena': phenomena that result automatically from events (namely, parameter fixing) that involve deeper entities (namely, principles).[59]

4.4 Architecture of the capacities layer
(Of layered layers and holed holes)

The layer of language capacities resembles the rabbit-hole down which Alice tumbled into Wonderland in an interesting way. As she fell down this hole, Alice noticed that its sides were filled with cupboards and bookshelves:

> '... here and there she saw maps and pictures hung upon pegs. She took down a jar from one of the shelves as she passed: it was labeled "ORANGE MARMALADE," but to her great disappointment it was empty: she did not like to drop the jar, for fear of killing somebody underneath, so managed to put it into one of the cupboards as she fell past it.' [*AIW* 26-27]

In her fall, Alice plunged past various layers of cupboards and shelves, which means of course that the rabbit-hole was in a sense a layered hole. And interestingly enough, the layer of language capacities displays a like kind of architecture: it is a layered layer.

(Come to think of it, the Wonderland counterpart of a layered layer could well be a holed hole!)

Now the layer of language capacities, so we have found, is made up of three sublayers: those of processing systems, of knowledge of language and of the language acquisition capacity. These sublayers are linked to each other in essentially the same way as the four main layers of the world of language are. The link is that of conceptual necessity. For, as we have seen, language processing systems conceptually presuppose knowledge of language and, in turn, knowledge of language conceptually presupposes a language acquisition capacity. The existence of the capacities located in the three sublayers has, in addition, been amply confirmed by empirical linguistic inquiry.

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Which brings us to another point of resemblance. A remarkable feature of Alice's plunge down the rabbit-hole is how very long it went on for:

> '"I wonder how many miles I've fallen by this time?" she said aloud. "I must be getting somewhere near the centre of the earth. Let me see: that would be four thousand miles down, I think -".' [*AIW* 27]

Obviously, Alice didn't stand(!) a chance of getting a proper look at everything that she passed on the way down: the extraordinarily deep hole simply had too many things lining its sides.

In our macroscopic survey of language capacities, we find ourselves caught up in a process too much like Alice's plunge. The layer of language capacities has turned out to be remarkably rich in ingredients. So rich that a first macroscopic survey simply cannot focus on more than the primary components of this layer: the language processing systems, knowledge of language and the language acquisition capacity. Any

proper look at secondary capacities, abilities and skills --- for example, those presupposed by reading and writing, and also those involved in the various modes of speaking, listening, reading and writing --- will accordingly have to await a less Alice-like, more leisurely, probe of the layer of language capacities.[60]

5 Its Codelike Core

> *'"I never went to [the classical master]," the Mock Turtle said with a sigh. "He taught Laughing and Grief, they used to say."' [AIW 130]*

What about Clubs? Perhaps you too have been wondering about them all along: Why, in Wonderland, doesn't one ever bump into a King or a Queen of Clubs? The answer, I guess, is that Wonderland is not really a domain where just anything goes. On the contrary, for a dreamworld it is in many ways a pretty sane place. For example, it hasn't got room for a king or a queen of someone/thing if there isn't the corresponding someone/thing to be king or queen of. A 'monarch without subjects' is, after all, conceptually an anomaly. So since Clubs are hard to find (for whatever reason) among the card commoners populating this dreamworld, there can be no Queen or King of Clubs.

In the world of language, the same kind of sanity prevails. To see what this means, consider the idea of 'knowledge of language'. Obviously, in a sane world, someone cannot have knowledge of something unless there is the corresponding something to be known. Parallel to kings and queens who require subjects-to-be-ruled, knowledge requires objects-to-be-known. But this implies that, if there is a thing such as knowledge of language --- as has been claimed in par. 4.2 above --- there has to be something called **language**. Which is to say that conceptual necessity requires linguistic reality to have a fourth, deeper layer of objects: **the layer of language in general and of particular languages**. It is with the ingredients of this layer --- making up the core of the world of language --- that we will be concerned in the present chapter.

The general questions that we will take up are the following two: 'What is language?' and 'What is a language?' (Often it will be convenient to condense them into a single question, 'What is (a) language?') They may seem simple; in fact however, as questions go, they turn

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out to e real toughies. For one thing, they concern the nature of entities that belong in the most deeply hidden layer of linguistic reality. For another thing, these entities, unlike Alice, could not speak for themselves if we were to ask them '*What* are you?' When she was actually asked this by the Pigeon --- he mistook her for an egg-snatching serpent because of the great length of neck that she grew from having a bite of mushroom --- here is what Alice replied:

> '"But I'm *not* a serpent, I tell you!
> .... I'm a - I'm - "'

To which the Pigeon responded impatiently:

> '"Well! *What* are you .... I can see you're trying to invent something!"' [*AIW* 76]

But, you may wonder, do we really have to do such an awful lot of inventing to arrive at an answer to the question 'What is (a) language?' Why, for instance, can't we simply say: '(A) language is (i) whatever is known by someone who has knowledge of language, (ii) whatever is acquired by someone who learns (or "grows") a language, (iii) whatever is used by someone who produces, comprehends or intuitively judges utterances'? Whilst evidently true, this answer resembles the attempt by the Queen of Hearts to say what a Mock Turtle is:

> 'Then the Queen left off, quite out of breath, and said to Alice, "Have you seen the Mock Turtle yet?"
> "No," said Alice, "I don't even know what a Mock Turtle is."
> "It's the thing Mock Turtle Soup[5] is made from," said the Queen.' [*AIW* 124]

This characterization of a Mock Turtle has to be admired as a product of fancy rhetorical footwork. Yet it is quite empty. Even if you know your food, you would have your work cut out to come up with a mental picture of a Mock Turtle on the basis of the look, taste, and

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substance of Mock Turtle Soup.[1] The portrayal of (a) language as that which is known, acquired, used etc. by speaker-listeners is about as far from informative as the Queen's characterization of a Mock Turtle.

So what can we do to get a more adequate answer to the question 'What is (a) language?'. One rewarding line of action is, firstly, to look at (a) language from the macroscopic perspective of the major dimensions of the world of language. And, secondly, to focus on the most salient large-scale properties that characterize (a) language in some of these dimensions. Here we will restrict our attention to five of the major dimensions: function, form, structure, use and substance. (Another dimension is that of phylogeny; we will come to it in chapter 6.)

In pursuing the question 'What is (a) language?', we will have to keep in mind a distinction drawn in par. 2.1.1 above: that between utterances and sentences. Spoken utterances, you may recall, are unique stretches of speech sound that are ingredients of the layer of language products. Sentences, by contrast, are non-physical entities that can be uttered more than once. As such, sentences are not to be found in the layer of language products. Below we will concern ourselves with the properties of sentences, not those of utterances. To identify and illustrate the properties of a sentence, however, it will always be necessary for us to furnish some written utterance of the sentence (or, if you like, an utterance by which the sentence is realized in writing).

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5.1 Function

(Of a watch that doesn't tell you what o'clock it is)

Soon after entering the world of language in par. 2, we were given some details about the Hatter's curious watch, the one that the March Hare dipped into his cup of tea to get some crumbs out of the works. Alice too found this watch rather 'funny', since:

'It tells the day of the month, and doesn't tell what o'clock it is! [*AIW* 96]

By describing what the Hatter's watch does and does not do, Alice gives us information about its function as well as some clues about its make-up. A watch not telling 'what o'clock it is' obviously won't have the hands, face or clockwork of a conventional watch. To find out *what* something *is*, it is generally good policy first to find out *what* it is *for*: that is, to find out its function (should it have one, of course). The function of a thing not only throws light on its nature, but often indirectly reflects the way in which it is put together and works. So, to tackle the question 'What is language?', let us consider first the **function** of language.

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5.1.1 Instrumentality

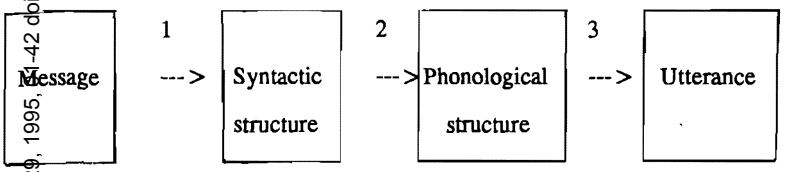
(*In which the White Queen turns into a Sheep, old and bespectacled*)

One of the episodes in Alice's visit to Looking-Glass Country includes the following weird events:

- The White Queen turns into a bespectacled old Sheep which knits away busily behind the counter of a shop, using up to fourteen pairs of needles at the same time. [*TLG* 252]
- More or less simultaneously, the Queen's cry 'Oh, much better!' is transformed --- via 'Much be-etter! Be-etter! Be-ee-etter!' --- into the bleat 'Be-e-ehh!' [*TLG* 252]
- A moment later, the shop becomes a little boat in which Alice and the old Sheep glide along between the banks of a river. [*TLG* 254]
- And the knitting-needles in their hands turn into oars. [*TLG* 254]

'Conversion' is clearly the name of the game in this episode. As a matter of fact, conversions of this confounding kind commonly occur in Lewis Carroll's worlds, contributing greatly to their dreamlike quality.

Conversions are basic ingredients of real worlds too, however, the world of language being a case in point. We have seen, for example, that the production of utterances involves the conversion, translation or mapping of messages into stretches of observable speech, writing or signing.[2] In the case of speech production, the conversion can be broken up into at least the three clusters of processes shown by the numbered arrows in Figure 1:



1 = grammatical encoding 2 = phonological encoding 3 = articulating

Figure 1: 'Productive' Conversion[3]

Proceeding in the opposite direction, speech comprehension converts spoken utterances into the messages encoded in them.[4] The conversion involved in speech comprehension is made up of the three clusters of processes shown by the numbered arrows in Figure 2:

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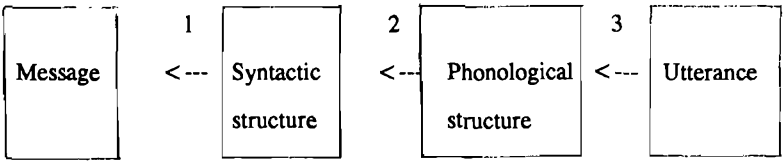

Figure 2: 'Comprehensive' Conversion

So conversion is essential to both speech production and speech comprehension.[5] But the kind of conversion that occurs in speech production/comprehension and the kind that happens in Carrollinian dreamworlds are as different as chalk and cheese. The Carrollinian kind boggles the mind: it is clear neither *why* these conversions occur nor *how* they work. There is nothing systematic governing, for example, the conversion of a queen into a sheep. This is to say that the occurrence, nature, direction, input, outcome and so on of dreamworld conversions are quite mysterious. Engaging they may be, even enchanting; but they are not explainable in sober, systematic terms.

The conversion that occurs in speech production and comprehension, by contrast, is not of this mind-blowing kind. There is a principled means --- portrayed as a **code** by some --- that people use in a non-mysterious way in converting their messages into utterances and vice versa. This means is called **language**. To put it schematically:

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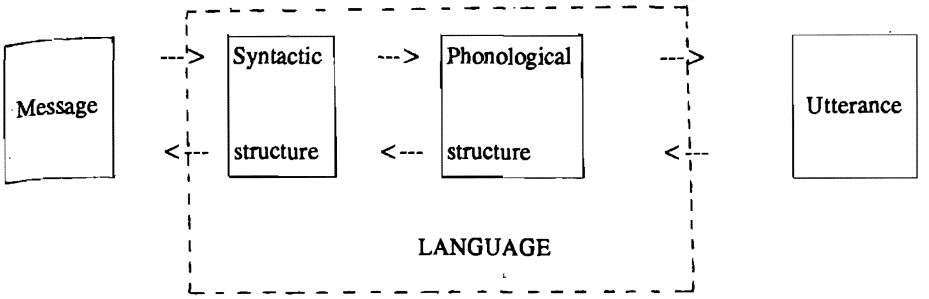

Figure 3: Language

Each different language is a different instantiation of the general means involved in the conversion of messages into utterances and vice versa. To know a language, then, is to have at one's command a particular means used in the conversion of messages into utterances and vice versa. To the way in which (a) language is involved in this conversion process, we will turn in par. 5.2.2 below.[6]

Over the years, the essence of this functional characterization of language has been expressed by various scholars in various, yet basically equivalent, ways. Recently, Noam Chomsky has described a language as a particular way both of expressing thought and of understanding the thought expressed. And, using more technical terms, he has characterized a language as a particular **generative procedure**: a procedure that assigns to every possible expression of the language a representation of its form and a representation of its meaning. The idea that a language is a generative procedure has its roots, as Chomsky emphasizes, in the thinking of Wilhelm von Humboldt. This famous German scholar of the nineteenth century characterized language as an *Erzeugung*, freely translatable as 'a process of generation', which makes infinite use of finite means.[7]

Returning to Figure 3, the means offered by (a) language for converting messages into utterances and vice versa are of two kinds. First, there are the structures enclosed in the 'unbroken' boxes: syntactic and phonological structures representing intermediate 'steps' in the

conversion of messages into utterances and vice versa. Second, there are the entities represented by the arrows: the mechanisms involved in the conversion of messages into syntactic structures and vice versa, syntactic structures into phonological structures and vice versa, and phonological structures into utterances and vice versa. As we saw in par. 4.2.2.1, these mechanisms are of two general kinds: words or lexical items making up the lexical aspect of (a) language, and rules and 'super-rules' forming the combinatorial or computational aspect of (a) language.

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To see this skeletal picture of the make-up of language in the right perspective, we make another foray into Looking-Glass Country, dropping in on a particularly instructive conversation between Alice and a chicken-sized Gnat [*TLG* 222-223]. At issue: Alice's rather narrow conception of (the names of) insects. Contrary to what she believes, the giant Gnat tells Alice, there is not only the ordinary Horse-fly, but also the Rocking-horse-fly (made entirely of wood and living on sap and sawdust). Not only the ordinary Dragon-fly, but also the Snap-dragon-fly (whose body is made of plum-pudding, whose wings consist of holly-leaves and whose head is a raisin burning in brandy). And not only the ordinary Butterfly, but also the Bread-and-butter-fly (whose wings are thin slices of bread-and-butter, whose body is a crust, and whose head is a lump of sugar). One of the general points implicitly being made by the Gnat is that there are not only narrower (poorer, less inclusive, more limited) conceptions of things, but also wider (richer, more inclusive, less limited) conceptions of them. Indeed, part of the reason why Alice finds the dreamworlds she visits so utterly bewildering lies in the narrowness of her own conceptions of things (and events).

The distinction between narrower and wider conceptions of things does not, however, apply to dreamworlds only. It applies equally to real places such as the world of language. Thus, the conception of language represented schematically in Figure 3 above is in more than one way quite a narrow one. For example, on this conception, language includes grammar only. Which is to say that language is narrowly taken to equal the object of knowledge of grammar or of

grammatical competence. Recall that knowledge of language has, however, two more components: pragmatic competence (or knowledge of appropriate use) and the conceptual system (or knowledge of how to build and reconstruct messages). This is to say that firstly, on a less narrow conception of it, language has an additional component that is 'Rocking-horse-fly'-like, comprising principles of appropriate use. Secondly, language has a component that is 'Snap-dragon-fly'-like, including means of message construction and reconstruction.

Grammar itself too can be thought of in less restrictive terms. On one possible richer conception of it, linguists have been taking grammar to include more than one intermediate 'step' (or level) of syntactic structure and more than one intermediate 'step' (or level) of phonological structure. And, this conception of grammar they have further enriched by supposing a kind of 'Bread-and-butter-fly'-like structure, often called 'semantic structure', to mediate in the conversion of messages into syntactic structures and vice versa.[8]

§1.2 Productivity

(Of professorial Whales and other confounding creatures)

Language, few will deny, allows people to talk about everything under the sun and even about things in worlds located light years beyond the sun. What is more, language enables people to talk about out-of-the-ordinary things: nonexisting things such as those found in the dreamworlds visited by Alice. You will recall that language enables them to say things about some really curious creatures. Blue hookah-smoking caterpillars. Thin-skinned (or rather 'thin-shelled') eggs wearing cravats. Bloodthirsty Queens of Cards. Professorial whales each wearing a gown and mortar-board. Siamese twin-cats speaking in tandem. And so on, and so on. Language enables people to describe out-of-this-world events such as girls growing to be ten feet high, babies turning into pigs, cats disappearing to leave only their grins behind and so forth. In sum: there is nothing that people can think up that they cannot express by producing

linguistic utterances. That is to say, the use of language is unbounded in scope --- a feature of language use that contributes greatly to the creative aspect of language behaviour, as we saw in par. 3.2.5 above.

But how is it possible for language use to be unbounded in scope? Part of a suggested answer is that, as a means of converting messages into utterances and utterances into intended messages, language itself has a particular functional property: it is **productive**. This means --- it has been contended --- that, whatever the human thought or message, human language enables us to convert it into an (acceptable) utterance. By the same token, every (acceptable) utterance --- it has been contended --- can be converted with the aid of this means into a thought or intended message. These contentions are captured by some linguists by means of the concept of 'effability'. Specifically, they claim that the 'essential' property of languages is that their grammatical structure constitutes an **effable correlation** of sentences and senses (or meanings). In the solemn kind of phraseology found so irresistible by the Dodo, this implies that there will never be a case where a speaker is unable to express a thought because of the non-existence of an appropriate sentence and sense. Or, to put the point of the argument more positively, there will always be sufficient sentences and senses.[9]

But how is it possible for language to be productive? What is it that makes language the productive means that it is? As we proceed, we will examine some of the non-functional properties of language from which its productivity springs.

5.2 Form

(On what makes it tick)

Knowing the function of something S does indeed give one a better understanding of the nature of S. But to understand its nature more fully, one has to inspect its clockwork in a more direct

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way. This means that we have to train our macroscope on the words or lexical items, on the rules and on the 'super-rules' as well as on the structures involved in the conversion of messages into utterances and vice versa. We will be concerned with the large-scale properties of these generative mechanisms, which is to say that we will be focusing on the **form** of language.

5.2.1 Arbitrariness

(In which Humpty makes 'glory' mean "a nice knock-down argument")

The words making up the vocabulary or lexicon of language is a first source of its productivity. But exactly what is it in the nature of words that boosts the productivity of language? The way in which Humpty Dumpty treats the words that work for him sheds quite a bit of light on the matter: he makes them mean just what he chooses them to mean --- 'neither more nor less' [*TLG* 269]. For example, despite Alice's misgivings, Humpty makes the word *glory* mean 'a nice knock-down argument'. And he makes *impenetrability* mean 'we have had enough of that subject, and it would be just as well if you'd mention what you mean to do next, as I suppose you don't mean to stop here all the rest of your life'.

But how is it possible for Humpty to make words mean what he chooses them to mean? Contrary to what he claims, it isn't the extra wages he pays them that do the trick. What does do the trick is that he himself rather (cleverly) exploits the nature of the relation between the sound form of a word and its meaning. This is a relation of **arbitrariness**: in the case of the overwhelming majority of words, there is no principled reason why a given form and a given meaning are paired. For example, there is no reason why the sound form of the word *glory* has to mean something like 'the fame and admiration that you gain by doing something notable'. Nothing in this sound form requires it to be paired with this meaning. Conversely, nothing in this meaning requires it to be associated with the sound form of *glory*. The same remarks

apply, of course, to *impenetrability*. It is the arbitrariness of the link between their sound form and their meaning that enables Humpty to assign a new meaning to words such as *glory* and *impenetrability* --- nothing in their sound form makes it impossible for them to be assigned such new meanings.

The pairing of forms and meanings is established by **convention** in all but a restricted number of words. The latter words --- as exemplified by *woof*, *meow*, *cockadoodledoo* and other onomatopoeic items --- are **iconic**: their sound forms are believed to be related by some physical resemblance or other to what they 'stand for'. *Glory*, *impenetrability* and the vast majority of other words, by contrast, are **symbolic**: their sound forms are related by convention to what they 'stand for'. Foregrounding this fact, quite a number of linguists have portrayed language as a **symbol(ic) system**. This conception of language had its origins in the thought of the Swiss linguist Ferdinand de Saussure, who has been credited with formulating the 'principle of the arbitrariness of the linguistic sign.'[10]

The arbitrariness of the link between the form and meaning of words contributes to the productivity of language in more than one way. First, speaker-hearers can add new words to the lexicon of their language without having to agonize over the question whether a particular form is 'right for' or a 'good match for' a particular meaning and vice versa. The author of Jabberwocky, for example, had no need to worry about whether the form of *toves* is the 'right' or the 'best' form for the meaning 'badgers with smooth white hair, long hind legs and short horns like a stag, living chiefly on cheese'. Nor was it necessary for him to find a principled reason for pairing the meaning 'land turtles with an erect head, a mouth like a shark, forelegs curved so that they walk on their knees, a smooth green body and living on swallows and oysters' with the form of *raths* [*TLG* 191]. Incidentally, although Humpty understood the arbitrary nature of the link between word form and word meaning, he was rather confused about the meaning of proper names. He believed that 'Humpty Dumpty' meant 'the shape he was in' and that, like his own name, all other names must mean something. And he chided

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Alice for having a 'stupid' name: a name that had no meaning and that consequently allowed her to be 'in any shape, almost'. [*TLG* 263]

Second, the arbitrariness of the link between the form of a word and its meaning makes it possible for speaker-hearers to have words that denote abstract, non-material 'things' such as glory, anger, minds, dreams and so on. And also words that denote nonexistent creatures such as unicorns, gryphons and other denizens of nonreal places such as the universes of fairy tales, science fiction and so. Had the relation between word form and word meaning been non-arbitrary or natural, it would not have been possible to have words that denote abstract or nonexistent entities: the forms of words are by their very nature concrete existing entities. Not even in Wonderland do we find creatures speaking a kind of language whose laws require that words denoting abstract entities are to have abstract forms, or words denoting nonexistent entities are to have nonexistent forms!

There is a price to pay, however, for the arbitrary and conventional nature of the link between the form and meaning of words. People acquiring a language have to learn its words by rote, a factor that places quite a burden on their memory. This can be particularly taxing when learning the lexicon of a second or foreign language in which (more or less) known meanings are arbitrarily associated with (more or less) unfamiliar forms. The problems caused for language learners by an arbitrary relation between the form and meaning of words are heavily outweighed, however, by the ways in which such arbitrariness contributes to the productivity of language.[11]

5.2.2 Principledness
(In which the Law of Gravity is broken)

The main source of the productivity of language, however, is located in the nature of grammatical rules and linguistic 'super-rules' or universals. **Grammatical rules** are linguistic principles that are specific to individual languages. The following three examples are peculiar to English (and a few related other languages):

1 A (declarative) sentence consists of a Noun Phrase followed by a Verb Phrase.

2 In a Verb Phrase, the verb precedes the role-bearing phrases.

3 To form a *yes/no* question, switch the subject Noun Phrase of the main clause and its Auxiliary.[12]

Linguistic universals, by contrast, represent linguistic principles that are independent of individual languages. In par. 3.3 above, we considered the following examples:

4 The operations expressed by grammatical rules such as 3 are structure-dependent.

5 If (a) X and Y are explicit or understood components such as names, pronouns, anaphoric elements, etc.,
(b) X is a component of a main clause and Y is a component of a clause embedded in this main clause, and
(c) the embedded clause has a subject that is distinct from Y,
then X and Y cannot be linked by a linguistic rule.

6 A phrase consists of a head word and, amongst other things, a number of smaller, role-bearing phrases.[13]

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But in what sense are grammatical rules and linguistic universals involved in the conversion of messages into utterances and utterances into intended messages? To forestall a possible misunderstanding: such rules and universals do not represent the neurological, physiological or physical processes that actually happen as speakers convert messages into utterances or hearers convert utterances into messages. This implies, amongst other things, that these rules and universals are not intended to model concrete aspects of the structure and dynamics of the human brain. Rather, they are thought to govern this process of conversion (and to govern it) without forming part of it. Grammatical rules and linguistic universals represent what is principled or lawful at an abstract level in the conversion of messages into utterances and vice versa. So, in the case of a specific rule or universal, what does this boil down to?

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Consider once more rule 3: 'A (declarative) sentence consists of a noun phrase followed by a verb phrase'. This rule makes a number of distinctions, including the following:

7a sentences (as well-formed sequences of words) vs. things that are non-sentences

b *declarative sentences* vs. *non-declarative sentences*

c Noun Phrases vs. Verb Phrases

d following vs. preceding

Rule 3 governs the conversion of messages into utterances and vice versa by requiring that, at some stage, this conversion somehow must also make (at least) these four distinctions. Unless the conversion process did just this, it would not be able to match messages and utterances effectively, as is made clear in 8a - d below:

8a Unless the distinction of 7a is made, the processes of conversion may try (unsuccesfully) to convert the ill-formed sequence of words *Queen Executioner the the fired* into some intended message.

b Unless the distinction of 7b is made, *Has the Executioner been fired by the Queen?* may erroneously be regarded as an utterance of an ill-formed declarative sentence which cannot be converted into some intended message. It is, in fact, an utterance of a well-formed question.

c Unless the distinction of 7c is made, the deviant utterance *The Queen the Executioner* may erroneously be regarded as an utterance of a declarative sentence. It is, in fact, an utterance of a sentence which incorporates a Noun Phrase only (*the Executioner*) where it should have had a Verb Phrase (e.g., *fired the Executioner*).

d Unless the distinction of 7d is made, the utterance *Fired the Executioner the Queen* would erroneously be regarded as an utterance of a well-formed declarative sentence with which a meaning has to be associated. The sentence is ill-formed, in fact, since the Verb Phrase (*fired the Executioner*) follows rather than precedes the Noun Phrase (*the Queen*).

So here is the point: Grammatical rules, such as 1 - 3, and linguistic universals, such as 4 - 6, are involved in the process of conversion by expressing lawlike constraints that have to be obeyed at the level of **function** by the processes that actually engage in the conversion of messages into utterances and utterances into intended messages. These rules and universals have the 'job', in other words, of making sure that messages and utterances are matched correctly.

In a sense, grammatical rules and linguistic universals are the laws of language. To see the point of the qualification 'in a sense', consider the curious way in which Alice tumbled into Needle's Eye World:

'As she fell, her body would sometimes turn upside-down, so that earth and sky changed place, and the neatly tilled field seemed to hover high above her head. "What a

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> curious adventure this is, to be sure!" said Alice. "I'm certain I must be breaking the Law of Gravity: for, if I remember my lesson, it states that what goes up must come down - yet here am I clearly coming down - without ever having gone up"'. [*TNE* 8]

Alice's breaking 'the Law of Gravity' is a rather remarkable achievement, a feat possible in a dreamworld only. In real worlds, after all, physical laws cannot be broken, disobeyed, suspended, or the like. This is where the laws of language are different and why --- compared to laws of nature --- they are laws 'in a sense' only. People can break at will those laws of language of which they are or can become conscious. (As we have seen, the knowledge which linguistically untrained people have of (the laws of) their language is tacit only.[14]) A speaker of English who consciously knows grammatical rule 1, for instance, can break it to produce an utterance such as **Fired the Executioner the Queen* in which the Verb Phrase 'unlawfully' precedes the Noun Phrase. Similarly a speaker can violate linguistic universal 4, for example. Given a statement, say *The Hatter who is mad is innocent*, the speaker can violate linguistic universal 4 by forming the corresponding *yes/no* question in a structure-independent way, namely as **Is the Hatter who mad is innocent?* But there is a price to pay for breaking the laws of language: difficulty in getting your messages across if you are a speaker or difficulty in recovering other people's intended messages if you are a listener.

A sizable section of the population of Looking-Glass Country was made up of chess pieces: two Kings and two Queens, various Castles (two of which Alice saw walking arm in arm), a number of Pawns (of which a White one, the Queen's baby, rolled over and started to kick and cry), two Knights (who banged away at each other with clubs), some Horses (one of which wore anklets to protect its feet against shark bites) and so on. This wasn't all that strange since, as Alice told herself, Looking-Glass Country was marked out just like a large chessboard. And, she added in a tone of delight:

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> '"there ought to be some men moving about somewhere - and so there are! .... It's a great huge game of chess that's being played - all over the world - if this *is* the world at all, you know".' [*TLG* 207-208]

But if a place is actually a chessboard and the events occurring in it are in essence moves in a game of chess, there simply have to be chess pieces among its surface population. These pieces (or characters) are in a sense 'derivative' or 'epiphenomenal' entities: their existence is an automatic result of the dreamworld's deeper architecture and deeper dynamics.

Rather like Looking-Glass chess pieces, grammatical rules may well in a specific sense be derivative entities or epiphenomena too. In the late seventies, Noam Chomsky has in fact suggested that such rules result automatically from events that involve deeper entities. Specifically, he portrays language as being a system of **principles** with **open parameters**. **Individual languages** differ in how the open parameters are fixed, set or filled in. A rule of grammar, on this conception, represents a specific parameter fixing or setting. This point was illustrated in par. 4.3.4 with reference to principle 9 (first considered above as linguistic universal 6).

> 9 A phrase consists of a head word and, amongst other things, a number of smaller, role-bearing phrases.

This principle has an open parameter involving the relative positions of the head word and role-bearing phrases. In the case of the verb phrase *gave the stolen tarts to Alice*, the head word is the verb *gave*, which precedes the role-bearing phrases *the stolen tarts* and *to Alice*. English, clearly, fixes the relevant open word-order parameter by choosing the 'head first' option. This parameter-fixing can be expressed derivatively as a grammatical rule:

> 10 In a Verb Phrase in English, the verb precedes the role-bearing phrases (if any).

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Japanese, however, fixes the open word-order parameter of principle 9 in a different way, namely by choosing the 'head last' option. This parameter-fixing can be stated derivatively as a grammatical rule too:

11 In a Verb Phrase in Japanese, the verb follows the role-bearing phrases (if any).

Clearly, grammatical rules such as 10 and 11 are not basic entities. They represent 'shallow', derivative entities or epiphenomena resulting from something (parameter-fixing) that happens to deeper entities (principles with open parameters). On this view, an individual language is not in essence a rule system; it is rather a system of fixed parameters (or, if you like, parameter-fixings).[15]

5.2.3 Discreteness

(Of a fluid and its extraordinary flavour)

But what is it in the nature of grammatical rules and 'super-rules' that makes language such a productive means of linking messages to utterances and vice versa? Let us pursue this question by going back to an incident in Wonderland in which Alice drank a strange fluid that shrunk her to a mere ten inches. The fluid had an extraordinary flavour, described by Alice in the following way:

> '... it had in fact a sort of mixed flavour of cherry-tart, custard, pine-apple, roast Turkey, toffy and hot buttered toast.' [*AIW* 31]

It is clear that Alice did not taste (or smell) cherry-tart, custard and so on as distinct ingredients of the fluid. These ingredients, obviously, were blended in the fluid, her description being

suggestive of the general flavour of the blend. The properties of a blend lie in between the properties of the ingredients; the properties of the ingredients are lost in the mixture. In short, in a blend, the ingredients become indistinct.

Compound linguistic expressions such as the sentence (underlying the utterance) *Alice watched the Cat* are not blends. They are made up of a finite number of discrete elements --- the words *Alice*, *watched*, *the*, *Cat* --- and their properties do not lie somewhere in between the properties of these elements. For example, the meaning of *Alice watched the Cat* is distinct from the meaning of any of the words of which it is made up. And the meaning of this sentence is distinct from that of *The Cat watched Alice*, in which the same words are combined differently.

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But in what sense can the words making up a sentence be considered **discrete**? In the sense that they remain identifiable as distinct units which can be recombined to form other sentences. That is, when words are put together into sentences, they are not irretrievably mashed together. Sentences can always be broken down again into individual words. A sentence is therefore never a 'continuum' in the sense of a thing that is without parts and the same from beginning to end. The words making up a sentence remain identifiable since they contrast with other words. Thus, in *The Cat watched Alice*, *the* contrasts, for example, with *a*, *Cat* with *Queen*, *watched* with *licked* and *Alice* with *Mabel*.

Similarly, the (sound) forms of words are not indivisible streams/bursts of noise. For example, the form of the word *Cat* can be segmented into three distinct speech sounds represented by *C*, *a* and *t*. And because of their discreteness, these sounds can be (re-)combined in other orders to build other word forms --- those of *act* and *tack* in particular. (In English spelling, the letter *c* of *cat* and the letter pair *ck* of *tack* represent the same speech sound.) The discreteness of speech sounds ties in with the fact that they are used to contrast with each other in certain positions in the forms of words in order to distinguish those forms from each other. For example, the sound represented by *c* contrasts with the one represented by *g* at the beginning of

the form of *cat*. And there isn't a distinct English speech sound between *c* and *g*, one which is 'not quite' *c* or 'almost' *g*, though it is possible for speakers of English to produce such a sound. It is because *c* contrasts with *g* in certain positions in word forms that speaker-listeners identify *c* as a distinct speech sound in a form such as that of *cat*. In terms of the relation of contrast, speech sounds have to be either distinct or identical, and simply cannot be 'somewhat', 'a lot' or 'almost' like each other.

As units used for distinguishing the form of words, speech sounds are, as a matter of fact, not noises. As we saw in par 2.1.1 above, noise is an ingredient of the layer of language products: the signal of spoken utterances exists (fleetingly) as noise. Speech sounds --- or **phonemes**, as they are also known --- are entities found in the layer of language, where they serve to distinguish the forms of words, which are major building blocks of sentences. It is when sentences are produced as utterances that noises are made which correspond, though in an indirect way, to speech sounds. Likewise, the layer of language behaviour and the layer of knowledge of language also contain entities that correspond to speech sounds. In the layer of language behaviour, these corresponding entities are the acts of making and perceiving the noises that correspond to speech sounds. In the layer of knowledge of language, what corresponds to speech sounds is of course the speaker-hearers' tacit knowledge of how to perform those acts --- articulatory and perceptual --- that correspond to speech sounds. The place that an individual speech sound such as *t* has in the world of language can, in sum, be represented with the aid of the following figure:

Layers	t
Language products	The physical noise
Language behaviour	An act of making the noise An act of perceiving the noise
Knowledge of language	Knowledge required for making the noise Knowledge required for perceiving the noise
Language	The (known) distinctive speech sound

Figure 4

On the whole, animal communication systems are unlike human languages in regard to discreteness. The signals --- noises, movements, postures, gestures, colours, odours --- used by animals to communicate something are generally non-discrete. That is to say, these signals cannot be subdivided into contrasting repeatable units that correspond to the recombinable sounds or words of human language. When the White Queen's exclamation 'Oh, much better!' is transformed into the old Sheep's bleat 'Be-e-ehh!', something discrete is turned into something non-discrete or continuous.

The fact that sentences are not blends, but instead are discrete combinations of discrete elements, reflects a fundamental property of the system of rules of a language. This system is an example of a **discrete combinatorial system**. By means of such a system, a finite number of discrete elements can be manipulated --- selected, combined, permuted --- to create larger units or structures whose properties are distinct from those of the elements. A language, by

implication, is not an example of a blending system. **Blending systems** --- such as the one used for mixing the strange fluid that Alice drank --- allow the creation of combinations or compounds whose properties lie in between those of the elements which lose their individual properties in the resulting blends or mixtures.

Animal communication systems that use non-discrete signals are examples of **graded systems.** With such systems, the user produces new messages by changing the signal along some physical dimension. Changes in intensity, duration and so on signal parallel changes in the message. For example, by varying the intensity of its roar, a rhesus monkey can signal how aggressive it is: greater loudness signals greater aggression. And by varying the duration of its tail-wagging dance, a honeybee can signal the distance of a food source: the longer the bee takes over a certain part of the dance, the further the food source is from the hive.

The productivity of (a) human language benefits in no small way from its discreteness. For one thing, a language does not need to provide each of its users with a completely different sentence for expressing each new message. Rather, it serves its users by placing at their disposal differing combinations of discrete, existing words --- words coming from a limited stock. For another thing, the words belonging to this stock --- the lexicon --- do not need to have sound forms which are totally unlike. Rather, these sound forms can be different (re)combinations of discrete speech sounds drawn from a quite limited inventory. This means, among other things, that a speaker-hearer can use tens of thousands of distinct word forms without having to be able to produce or discriminate among tens of thousands of different speech sounds. In the case of English, being able to produce and discriminate among about forty distinct speech sounds is all that is needed. Which is something that even the Red Queen would find hard to sneer at![16]

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5.2.4 Duality

(In which the mystery surrounding 'toves' is cleared up at last)

While looking at the discreteness of language, we had a passing glimpse of another of language's fundamental properties, namely duality. Or at least of the long shadow which duality casts. But by this time, you will have grown wary of the existence of entities 'seen in passing' only, recalling the case of Nobody --- the individual who, despite his non-existence, was encountered on the road by one of the King's Messengers. Which caused the King to attribute to the non-existing Nobody the property of being a slow walker. Agreeing with you that one Nobody is enough, I suggest, then, that we face duality head on.

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Language exhibits **duality** in that it is patterned or organized at two levels which are distinct from each other and yet hang together in a particular way. At the first or higher level, sentences or phrases are built up out of meaningful words (or lexical items). As we have seen just above, at the first level, a sentence like *Alice watched the cat* is made up of meaningful words like *Alice*, *watched*, *the* and *cat*. At the second or lower level, the forms of these (inherently) meaningful words are built up out of (inherently) meaningless speech sounds. At this level, the form of the word *cat*, for example, is made up of the speech sounds representable by the letters *c*, *a* and *t*, respectively (and arranged in that order). If English had lacked duality, the form of a (meaningful) sentence would be directly built up out of (meaningless) speech sounds.

To say that language is characterized by duality is to say that it does not use just one combinatorial system of rules. It is to emphasize that language in fact uses two such rule systems. The first is for building phrases and sentences out of meaningful words. The rules 1 and 2 above and 25a-e below are rules of this sentence-building kind. The second combinatorial rule system builds word forms out of meaningless speech sounds. These rules include **phonotactic rules** (or conditions) which specify what sequences or combinations of

speech sounds may or may not occur where in word forms. The phonotactic rules, then, can be thought of as word-form laws, the following two being instances from English:

12a The sounds *l* and *b* can combine in this order at the end but not the beginning of a word form.

b The sounds *b* and *r* can combine in this order at the beginning but not the end of a word form.

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Rule 12a allows speakers of English to build a (new) word form such as ***dulb***, but not one such as ***lbud***. Rule 12b allows Lewis Carroll to build a (new) word form ***brillig***, but not one such as ***gdlibr***. Not one of the new words he uses in *Jabberwocky* breaks the phonotactic rules of English.

Duality links with both discreteness and arbitrariness to boost the productivity of language. In tandem with discreteness, duality makes it possible to combine a small number of meaningless speech sounds for building forms for a very large number of meaningful words, a point mentioned with reference to discreteness --- the partner of duality --- in par. 5.2.3 as well. Arbitrariness, in turn, opens the way for duality to make its contribution. To see how, suppose that each speech sound in the form of a word had to be linked in a non-arbitrary way to some bit of the meaning of the word. This would have severely restricted the ability of speech sounds to combine with each other. Take, for example, the (three) speech sounds that combine to make up the form of the English word *stove*. If these sounds had each been linked to some other bit of the word's meaning in some non-arbitrary way, they clearly could not be recombined by Lewis Carroll to build the form of the new word *toves*. Nor could these speech sounds be recombined to make up the form of the word *votes*. If each of these speech sounds had had a natural meaning, they clearly could not be used to build forms for words whose meanings differ so totally as those of *stove*, *toves* and *votes*. What arbitrariness does, then, is to

keep speaker-hearers free from any meaning-based constraints whenever they build word forms out of individual speech sounds.[17]

5.2.5 Infinity

(Of a very tired 8)

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The discreteness of language interacts in an interesting way with another of its fundamental properties, namely recursiveness. To see what recursiveness involves, consider the following set of expressions:

13a dream
b dream world
c dream world story
d dream world story teller
e dream world story teller guild
f dream world story teller guild convention
g dream world story teller guild convention venue
h dream world story teller guild convention venue ... .

Expressions like 13b - h are formed by a word formation rule that adds one noun (e.g., *world*) to another (e.g., *dream)* to form a compound noun or nominal compound (e.g., *dream world*). Such a rule can be applied 'recursively'; that is, it can be applied an unlimited number of times to its own output. For instance, the rule applies to 13b to form 13c, to 13c to form 13d, to 13d to form 13e and so on. In other words, because it is able to feed itself an unlimited number of times, the rule has the capacity of forming an unlimited/infinite number of noun compounds.

Certain syntactic rules --- that is, rules of sentence formation --- have the property of recursiveness too, as is illustrated by the following set of sentences:

14a The executioner botched the job.

b The Queen fears that the Executioner botched the job.

c The King believes that the Queen fears that the Executioner botched the job.

d Alice thinks that the King believes that the Queen fears that the Executioner botched the job.

e ... Alice thinks that the King believes that the Queen fears that the Executioner botched the job.

Sentence 14b is formed by a syntactic rule that embeds sentence 14a within the 'mother' or matrix sentence *The Queen fears* ...; sentence 14c results when this rule embeds sentence 14b within the matrix sentence *The King believes* ...; and so on. Like the word formation rule considered above, this syntactic rule can apply an unlimited number of times. Each application of the rule yields yet another sentence. This rule has the capacity of yielding an infinite number of sentences when applied in tandem with the rule(s) that create(s) the matrix sentences. **Recursiveness**, then, is the capacity of language to build an infinite number of units (words or sentences) from units of the same category.[18]

Which brings us to how discreteness and recursiveness interact in language. A discrete combinatorial system allows the formation of units (sentences) that can be counted. A discrete combinatorial system having the property of recursiveness allows the formation of infinitely many units (sentences). Discreteness and recursiveness, therefore, interact to allow the construction of a discrete infinity of meaningful expressions.

The kind of infinity found in the world of language is quite unlike the mysterious kind that figures in Needle's Eye World. Some of Alice's companions suspected Infinity to be the place

to which the never-ending tunnel out of the Maze led. Unable to form a clearer idea about the nature of Infinity, Alice herself speculated about Infinity along the following lines:

> '"Infinity, now .... all I know about it is that it looks like an 8 that was so tired, it simply *had* to lie down and take a nap. And it's where parallel lines meet, isn't it, and what a queer sight that must be! I wonder how they greet one another after such a long separation. Most people say 'Isn't it a small world!' but that wouldn't do at all. They'd say 'Isn't it a *large* world', rather." [*TNE* 130-131]

The infinity that characterizes language, namely **discrete infinity**, is of a less enchanting kind than the infinity that Alice was musing about. But our understanding of discrete infinity is 'infinitely' better, as is clear from the lucid way in which Noam Chomsky has characterized it:

> 'To put it simply, each sentence has a fixed number of words: one, two, three, forty-seven, ninety-three, etc. And there is no limit in principle to how many words the sentence may contain.'

Every time a sentence is extended through the addition of one or more words, one more distinct sentence is formed. This observation forms the basis for Chomsky's early characterization of a language as an infinite set of sentences.[19]

Noam Chomsky considers discrete infinity to be a basic property of language, one that is unusual among biological systems. None of the animal communication systems known to Chomsky have this property: these systems are either nondiscrete or finite. The difference between human language and animal communication systems is one of quality, not one of 'more' or 'less'. In identifying discrete infinity as a basic property of language, Chomsky has an illustrious forerunner, Wilhelm von Humboldt. About a hundred and fifty years ago, Humboldt came to understand that language is a system that makes infinite use of finite means.

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Today this insight can be captured in a more precise way with the aid of the concept of 'discrete infinity'.[20]

5.2.6 Structure-dependency

(In which the Executioner makes his own rules)

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In par. 5.2.2 above, we once again bumped into the idea that grammatical rules are structure-dependent. So it's time for us to look a bit more closely at structure-dependency (or dependence) as a fundamental property of language. This will lead us to a consideration of various other structural properties of language. It is possible to get a better grasp of the idea of structure-dependency by considering some of the woes of the professional life of the Queen's first executioner, now referred to simply as 'Ex-ex'. (You had no idea that the incumbent Executioner is a new boy?) Well, Ex-ex and the Queen did not exactly get on like a house on fire. He resented her 'mindless meddling' in his professional business ('It is better to be headless than mindless', he would often mutter under his breath.). She, in turn, threatened him with beheading (!), having him 'cut down to size' for 'being too clever by half'.

This disharmonious relationship had its roots in deep differences of opinion about how Ex-ex should go about selecting, from among those awaiting his attentions, 'the next victim for the administering of injustice', as he cynically put it. Desiring no more (and no less) than fast and furious action, the Queen urged him 'to line up the lot, to start with the first, and not to skip anybody in the queue'. This advice was firmly rejected by Ex-ex, since 'it would place me on a par with brainless butchers'. A sentiment to which the Queen responded apoplectically, shouting that if he had to be so smart, he should use the following rule (and should, above all, get on with the job):

The Queen's Rule

'Find every fifth condemned clod in the queue and move him/her to the front.'

Judging this rule to be 'too undiscriminating' ('It would appeal to serial killers only!'), Ex-ex proceeded to select 'my next charge' on the basis of his own rules, which he varied from day to day:

The Executioner's Rules

'Find the dumbest Knave (i.e., the one who didn't steal the Queen's tarts), and move him to front of the queue.'

'Find the Gardener who was the best at painting the Queen's white roses red, and move him to front of the queue.'

'Find the soldier who didn't walk off when he had to stand on his hands and feet as an arch in the Queen's croquet game, and move him to front of the queue.'

The rules followed by Ex-ex differ in an interesting way from the one proposed by the Queen. In terms of the Queen's rule, a 'condemned clod' gets moved to the front of the queue, if he/she is found in a place that can be determined by simply counting those lined up for execution. And he/she gets moved, regardless of his/her status or rank or how he/she is related to his/her companions in the queue. The rules followed by Ex-ex have a completely different nature: a condemned creature gets moved to the front if it is a particular kind of individual (e.g., a Knave) related in a certain way (e.g., in terms of dumbness) to its condemned companions.

In the learned language of the Dodo, the basic difference between the Queen's rule and those of Ex-ex is that between simple linearity and status or structure. The Queen's rule treats a queue of condemned creatures as a simple linear series of individuals who are equal in status. The rules of Ex-ex, by contrast, treat a queue of condemned creatures as a series with a

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structure: a structure that reflects the differences in category and/or status among those who form the queue and also the different ways in which they interrelate. This makes a Knave, for example, different from a Pawn or a Knight. Also, it accords the dumbest Knave a higher status --- in the dumbness hierarchy --- than the other Knaves. In terms of the rules followed by Ex-ex, the condemned creature selected for movement to the front of the queue must specifically be the most prominent person in some hierarchy. So, the operation of movement specified by the rules of Ex-ex is dependent on the structure of a series of entities. In other words, these rules have the property of structure-dependency. The Queen's rule specifies a structure-independent operation and has the property of structure-independency. (All of this, of course, was wasted on the Queen who, unable to get Ex-ex to behead himself, demoted him to woodcutter.)

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Which brings us to the nature of rules of sentence formation: language uses structure-dependent syntactic rules despite the fact that they are less simple than structure-independent ones. This is illustrated strikingly by the English rule for the formation of *yes/no* questions (henceforth: the *yes/no* question rule) such as 15b and 16b.[21]

15a The Queen is in a purple rage

b Is the Queen in a purple rage?

16a The Executioner is a woodcutter now.

b Is the Executioner a woodcutter now?

The following looks like the simplest rule for forming *yes/no* questions such as 15b and 16b:

17 Find the first occurrence of the verbal form *is* (or others like it), and move it to the front of the sentence.

This rule is very simple indeed: it considers linear order only; it inspects the individual words of a sentence until it finds the first *is* or similar other word; that word it then moves. But rule 17 runs into trouble in the case of the *yes/no* questions corresponding to declarative sentences such as 18a and 19a. Applying it in the above way, rule 17 incorrectly forms 18b and 19b as the *yes/no* questions corresponding to 18a and 19a, respectively. The respective correct *yes/no* questions are of course 18c and 19c:

18a The Queen, who is dumb, is in a purple rage.

b *Is the Queen, who dumb is, in a purple rage?

c Is the Queen, who is dumb, in a purple rage?

19a The Executioner, who is an intellectual, is a woodcutter now.

b *Is the Executioner, who an intellectual, is a woodcutter now?

c Is the Executioner, who is an intellectual, a woodcutter now?

No rule which refers to linear order alone will work in the case of *yes/no* questions corresponding to complex declarative sentences that contain more than one occurrence of *is* (or other similar words). For forming such complex *yes/no* questions, a rule in the vein of 20 is required:

20 Find the occurrence of *is* (or similar words) that is the main verb of the sentence [i.e., the verb of its main clause], and move it to the front of the sentence.

Rule 20 --- which says the same thing as rule 3 in a different way --- is a structure-dependent rule. It operates on expressions that are assigned a certain structure in terms of a hierarchy of phrases or clauses. This hierarchy in the case of 18a and 19a is partly indicated in 21a and 21b, respectively, by means of pairs of brackets around the relevant phrases.

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21a [The Queen [who is dumb]] is furious.

b [The Executioner [who is demanding a pay rise]] is in jail.

The main verb of complex sentences is that verb which is not embedded within brackets in diagrams such as 21a and 21b. (The more the pairs of brackets enclosing a word or phrase, the lower/deeper down it is in the hierarchy.) The structuring of 21a and 21b makes it possible for rule 20 to find the most prominent occurrence of *is* (or similar other words), which this rule then moves to the front of the sentence.

Noam Chomsky has stressed the surprising nature of the fact that human language uses structure-dependent rules rather than linear or structure-independent ones. There is no logical reason why this should be the case. On his view, it would be quite easy to construct languages that use (computationally) simpler linear rules. And such languages would serve the purposes of human language --- communication, expression of thought etc. --- perfectly well. But they would not be human languages: for children, they would be hard to learn; for adults, they would be hard to use. And so, Chomsky considers 'the principle of structure dependence' to be 'a significant, nontrivial property of human language'.[22]

5.3 Structure

(*Of queues that move in both directions and of stairways going only up*)

Now that we have considered some properties of the general form of language, we next turn to a number of the basic properties of the **structures** on which rules such as that for forming *yes/no* questions are dependent. Some of these properties, we will see, are not restricted to syntactic structure, but generalize to phonological structure as well.

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5.3.1 Hierarchicality

(*Of a species of topsy-turvy trees*)

It is quite natural to think of a sentence as a queue of words or, more formally, a linear string of lexical items. Physically, of course, it is simply impossible to produce two or more (distinct) words simultaneously; rather, (distinct) words are uttered serially --- one after the other --- both in speech and writing. This is the rule even in dreamworlds. It is a rule which Alice did try to break once, though, when she was desperate to get some service at the window of a little shop doing duty as a post office. There we find her

> '... taking a deep breath, and speaking so quickly that the words all rushed out together ....
>
> "Idverymuchliketobuyapostagestampplease!"' [*TNE* 147]

But these words of Alice's have not really been produced 'all at once': despite rushing out at one another's heels, they still form a queue or string.

So: in utterances, words are produced one after the other. This makes it hard to get away from the idea that, in sentences, words are interlinked by linear succession and by nothing more. And, by implication, hard to get away from the idea that sentences are word queues and nothing more. But, someone who knows about Needle's Eye World may object, there are queues and queues, a point which Alice would whole-heartedly endorse. For, having plunged down the tunnel leading out of the Maze in Needle's Eye World, she landed (fortunately) not in Infinity but (less fortunately) between the Red Queen and the White Queen in the middle of a most extraordinary queue. It was, to her surprise, a queue moving in both directions (between two little shops). The Queens, however, accepted this as quite normal:

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'"I daresay you've not had much experience of queues yet," was all the Red Queen would reply.

"Where I come from," Alice ventured to say, "they only move in one direction."

"What a waste of a good queue!", said the Red Queen.

"That'd be like a stairway that only went up, not down."' [*TNE* 140]

A two-way queue may well be able to move in opposite directions. But in terms of make-up, it is just another queue, consisting of members linked in no other way than simple left to right succession (or right to left succession). And in this respect, sentences are essentially different. To get a macroscopic view of how sentences are made up, we have to look, then, at the ways in which sentences are not just strings of words hanging together like the links of a chain (or the members of a queue). This immediately places on our agenda, believe it or not, the topic of trees.

Trees are rather special ingredients of the dreamworlds visited by Alice. For instance, the place from which the Cheshire Cat grins down on Wonderlanders is, as you know, a tree. And if you wonder who in Looking-Glass Country takes care of the talking flowers, you may be surprised to hear that it is a tree, one that knows what to do when danger threatens:

'"It could bark", said the Rose.

"It says Bough-wough!" cried a Daisy.

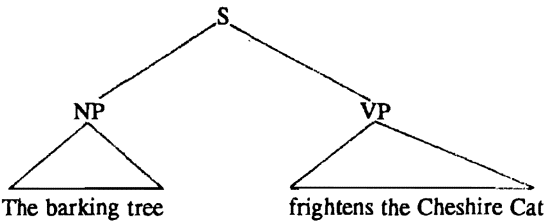
"That's why its branches are called boughs!"' [*TLG* 202]

Trees of a special species --- an upside-down variety --- are similarly important ingredients of the world of language: in terms of their make-up, or structure, sentences are trees. To see what this means, consider the following sentence (or, more precisely, the sentence underlying the following utterance):

22 The barking tree frightens the Cheshire Cat.

This sentence is made up of two big phrases: the Noun Phrase (NP) *the barking tree* and the Verb Phrase (VP) *frightens the Cheshire Cat*. That fact can be represented schematically with the aid of what is called a **tree (diagram)**.

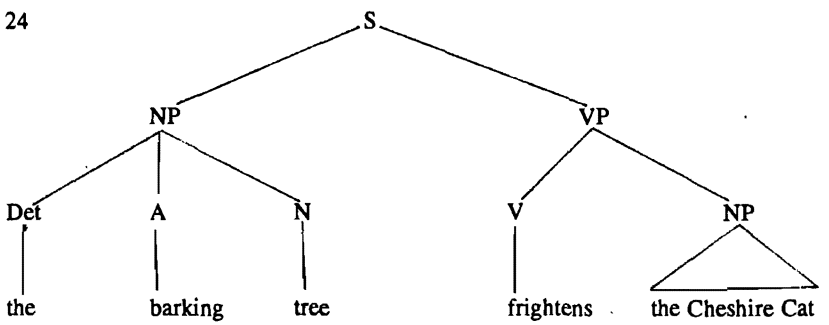
23



(In a tree diagram, a triangle means that the internal make-up of the phrase does not matter for the point(s) under discussion.)

The Noun Phrase *the barking tree* is in turn composed of the Determiner (Det) *the*, the Adjective (A) *barking* and the Noun (N) *tree*. And the Verb Phrase *frightens the Cheshire Cat* is constructed out of the Verb (V) *frightens* and the Noun Phrase *the Cheshire Cat*. To represent these facts schematically also, we can extend tree (32) by adding suitable branches to it, and so forming tree 24:

24



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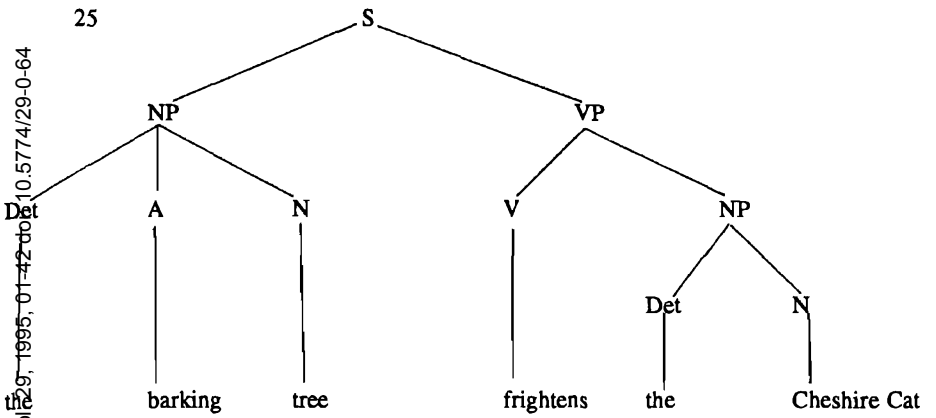
Finally the Noun Phrase *the Cheshire Cat* consists of the Determiner *the* and the Noun *Cheshire Cat*, which we can show schematically by adding appropriate branches to 24, giving 25.

25



25 roughly represents what is known as the 'phrase structure' of the sentence *The barking tree frightens the Cheshire Cat.*

So: trees like 24 and 25 represent (aspects of) the **phrase structure** of sentences. What is more, such trees are built by **phrase structure rules** like the following:

26a A (declarative) sentence consists of a Noun Phrase followed by a Verb Phrase.

b A Verb Phrase consists of a Verb followed by an optional Noun Phrase.

c A Noun Phrase consists of an optional Determiner, followed by one or more optional Adjectives, followed by a Noun.

d The Noun can be an item such as the following: *tree*, *Cheshire Cat*, *executioner*, *axe*, *gardener*, *Alice*, ...

e The Verb can be an item such as the following: *frightens*, *barks*, *beheads*, ...

The phrase structures built by such rules give information on important properties of sentences, such as the following:

- the smallest syntactic building blocks or constituents --- the (meaningful) **lexical units** (roughly, the meaningful words), which hang from the lowest branches --- and the **linear order** (the order from left to right) in which these smallest constituents follow one another;

- the **lexical categories** --- Determiner, Adjective, Noun, Verb --- to which the smallest constituents belong;

- the **syntactic phrases** formed by groups of words hanging together and the **syntactic categories** --- Noun Phrase, Verb Phrase --- to which these phrases belong;

- the **hierarchical** relations that hold among the various constituents: the NP and VP directly under (i.e., dominated directly by) the S are equally high in the hierarchy (i.e., of equal rank); the NP directly under the S is higher in the hierarchy than is the NP directly under the VP, and so on.

The grouping of words into phrases represents, of course, another way in which a sentence is not a simple string of words. In a simple string, every two neighbouring words are linked equally closely. A phrase structure is different in this respect: how closely any two adjacent

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words are interrelated depends on what phrase(s) they belong to. For example, *barking* and *tree* are closely interlinked because they are components of the same phrase. This is not so with *tree* and *frightens*: although they are adjacent, they are components of different phrases. So *tree* and *frightens* are structurally less closely interlinked than *barking* and *tree* are.

But let us get back to the idea of a 'hierarchy', which of course is a familiar one to Lewis Carroll fans. The social make-up of the dreamworlds he created is to a large extent hierarchical. At the top of the hierarchy, there are the Kings and Queens who rule over the progressively lower ranks of Duchesses, Knights, Knaves, and commoner footmen, gardners, soldiers and so on. And, like the structure of a sentence, the make-up of the House of Cards can be represented graphically with the aid of a tree diagram.

Recall that it is the nature of grammatical rules that requires us to think of sentences as tree structures rather than as simple word strings. We have seen that a rule such as the one for forming *yes/no* questions just won't 'work' correctly unless sentences are thought of as having a structure with a vertical or hierarchical dimension as well. Specifically, this rule moves *is* (or similar other words) if it is the main verb of the sentence, that is to say, if *is* is the verb of the highest clause or S in the hierarchy. This is illustrated graphically by tree 27, which represents the phrase structure of sentence 18a (= *The Queen, who is dumb, is in a purple rage*).

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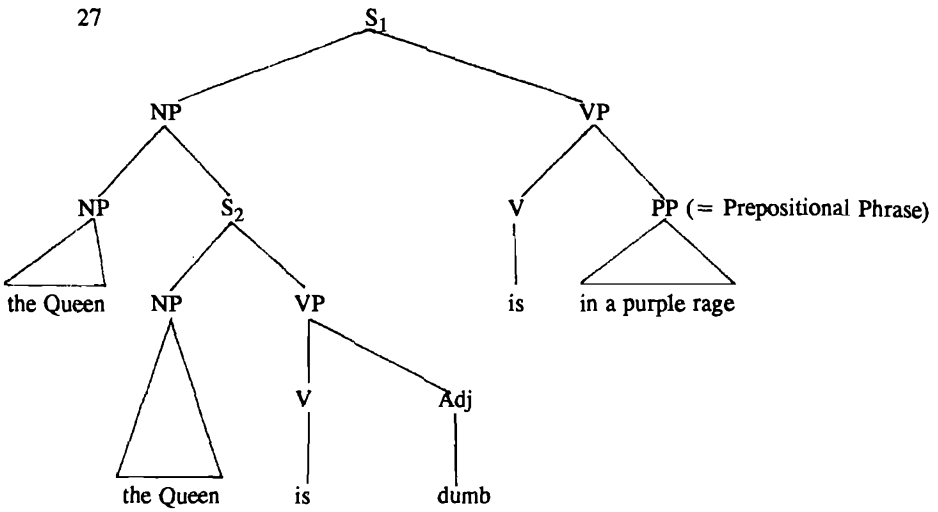
27



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The phrase structure represented in 27 has been built with the aid of, amongst others, a **recursive rule** which uses one clause (S_2) as a building block of another clause (S_1). In both S_1 and S_2 the verb is an *is* of the kind that can be moved to the front by the rule forming *yes/no* questions. This rule, however, picks out the *is* in S_1 for fronting since this *is* is the main verb of the sentence, being a constituent of the highest S, the **matrix sentence** ("mother sentence"). Though the *is* in S_2 is the first or leftmost *is*, it is ignored by the question rule because S_2 is not the highest S in the hierarchy.[23]

Before moving on to a second way in which sentences are not simple word strings, let's note that phrase structure is a quite economical kind of structure. That is, phrase structure uses the same limited number of phrase categories over and over in a variety of places in trees. This point is illustrated by the variety of positions in which the Noun Phrase *the barking tree* occurs in the following sentences:

28a [The barking tree] frightens the Cheshire Cat (= 22)

b The flowers adore [the barking tree].

c The Cat gave [the barking tree] a dismissive grin.

d The Cat sits in [the barking tree].

e [The barking tree]'s bark is worse than its bite.

f The Cat sharpens its nails on the bark of [the barking tree].

In 28a, the NP *the barking tree* occurs directly under the S; in 28b, it occurs directly under the VP; in 28c, it occurs directly under the VP but has a sister NP, *a dismissive grin*; in 28d, it forms part of a Prepositional Phrase along with the Preposition *in*; in 28e, it forms a bigger NP along with the genitive *'s*; in 28f, it forms part of a bigger NP of a different kind, a possessive NP.

This example shows that a tree (or, rather, the phrase structure represented by a tree) has the property of **modularity**. In the words of Steven Pinker:

> '... a tree is *modular*, like telephone jacks or garden hose couplers. A symbol like "NP" is like a connector or fitting of a certain shape. It allows one component (a phrase) to snap into any of several positions inside other components (larger phrases). Once a kind of phrase is defined by a rule and given its connector symbol, it never has to be defined again; the phrase can be plugged in anywhere there is a corresponding socket.'[24]

It is this plug-and-socket arrangement that makes phrase structure such an economical kind of structure. It allows the use of the same kind of phrase in a variety of different positions in a sentence. This, in a sense, is like having a single cast of actors for the various acts in the drama that unfolds in the course of Alice's visit to Wonderland. It would be pretty wasteful, to say the least, to have one team of Wonderlanders playing in the Queen's croquet game, a completely different cast acting in the Knave's trial and so on.

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5.3.2 Discontinuity

(Of an utterance split in two by the 'Sands of Dee')

Simple word strings, then, lack the vertical dimension so crucial to sentence structure. The basic relation holding between the words in such a string is that of being next to one another --- rubbing shoulders as it were --- or, to put it in terms more agreeable to the Dodo, that of **adjacency**. In the preceding paragraph, however, we have already seen that two words may be neighbours in a sentence without being closely related. (Which is a bit like Alice and the Hatter sitting next to each other at the Mad Teaparty without being related in any deeper way.) The absence of a deeper relation holding between two adjacent words is, of course, a consequence of the fact that the words in a sentence form groups or phrases. But what would this mean with regard to a sentence such as *The barking tree frightens the Cheshire Cat*? As is clear from tree diagram 25, the adjacent words *barking* and *tree* are closely interlinked in the sense that they are constituents of the same phrase, a Noun Phrase. In the case of *tree* and *frightens*, however, things are different. Though adjacent, *tree* and *frightens* are constituents of different phrases, a Noun Phrase and a Verb Phrase respectively. So, from a structural point of view, *tree* and *frightens* hang together less closely than *barking* and *tree* do. This is evident from the fact that, unlike *tree* and *frightens*, *barking* and *tree* are not separated from each other by rules that form sentences such as *The Cheshire Cat is frightened by the barking tree*. Clearly two words can be linearily adjacent and yet have considerable structural distance between them.

The opposite is true too, however, which brings us to a further important difference between trees and simple word strings. So let us renew our acquaintance with Ping and Pang, the Siamese-Twin Cats which do everything together, including speaking. As no doubt you are able to recall, when speaking, they collaborate to utter one and the same sentence, each doing its bit in turn. For example:

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'In a solemn voice, Ping said, "This tale (by yours -"' "-truly) -" said Pang, ending the modest bow begun by Ping .....

"- I have named '*The Sands of Dee*' -" said Ping.

"Why that's a coincidence," said Alice loudly:

"- its heroine I have named - er, I have -" [*TNE* 34]

One can hardly fail to notice it: the 'stretchiness' of the ongoing utterance "This tale by yours - truly - I have named '*The Sands of Dee*' - and its heroine - its heroine I have named - er, I have -". Or, if you like, the utterance is cut up. It is cut up in (at least) three ways: by Ping and Pang's each in turn having a go at playing the role of speaker, by Gilbert Adair's throwing in an aside, and by Alice's ill-timed butting in. Intruding between Ping's contribution 'I have named "The Sands of Dee"' and Pang's contribution '*and* its heroine ... its heroine I have named - er, I have -', Alice's interruption causes a discontinuity in the Ping-Pang utterance. Because of this interruption of Alice's, words that should have been linked end to end have been pushed away from each other.

Discontinuity comes in various kinds. The one caused by Alice's interruption is of a relatively uninteresting kind: the interruption causing it is a factor external to the structure of the sentence, a nonlinguistic factor. Now, however, consider the discontinuities exhibited by the sentences 29a - d.

29a If the Queen can have her way, then heads will roll.

b Either the Executioner gets on with the job or he gets fired.

c The Executioner will not cut the partly vanished Cat's head off.

d The Queen hates intellectual executioners and gardeners.

These discontinuities --- unlike the discontinuity caused by Alice's interruption --- are of an internal, structural kind: the syntactic structure of English is such that each pair of underlined

words forms part of the same **discontinuous constituent**, even though the members of each pair occur in two non-adjacent positions.

Structural discontinuity is a pervasive property of (English) sentences. A single sentence can in fact embody a hierarchy of discontinuities embedded within discontinuities. This is illustrated by 30:

A B C

30 If the Queen can either get someone to cut the heads of

D D C B

intellectual executioners and gardeners off or force

A

the King to clap them in chains, then she will be the

happiest person in Wonderland.

(In 30, the discontinuity A..A contains the discontinuity B..B, which contains the further discontinuity C..C, which in turn contains the discontinuity D..D.)

Simple strings of words cannot exhibit structural discontinuity. Indeed, simple strings of words are destroyed by such discontinuity. What is needed to keep the non-adjacent parts of discontinuous constituents together is a hierarchical structure, which is something unobservable.[25]

5.3.3 Long-distance dependency

(*Of a shared tail that can stretch up to twenty paces*)

Yes/no questions are not the only kind of questions used by speakers of English. This much is clear from some of the questions fired at Alice by the Caterpillar:

31a Who are *You*?

b What do you mean by that?

c What size do you want to be? [*AIW* 67-72]

These brusque questions are examples of *wh*-questions. Wh-questions are sentences that, in their first position, have either some *wh*-word such as *who* (*whom*, *whose*, *what*, *when* and so on) or some *wh*-expression such as *what size*. In understanding these questions of the Caterpillar's correctly, Alice has really done rather well. For example, in the Caterpillar's question *What do you mean by that*?, *what* occurs in the first position of the sentence. But Alice has to interpret this question as if *what* occurred after the verb *mean*, as in *You mean WHAT by that*? (This last, incidentally, isn't a *yes/no* question either.)

That certain words or expressions have to be interpreted 'out-of-place' illustrates another important way in which sentences are not simple word strings. But how is this kind of interpretation possible? Let us tackle this question by considering 32-34:

32a What did the Queen give to the Executioner?

b The Queen gave a double-edged axe to the Executioner.

33a Whom did the Knave sell the Queen's tarts to?

b The Knave sold the Queen's tarts to the Hatter.

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34a When did the Queen make the stolen tarts?

b The Queen made the stolen tarts on a summer's day.

In each of these, the a sentence is a *wh*-question and the b sentence is a possible answer to that *wh*-question.

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The above *wh*-questions are interesting in regard to meaning: though the *wh*-word occurs in the first position of the sentence, it is interpreted as if it occurred much later or further down in the sentence. Concretely, in 32a, *what* is interpreted as the direct object following the verb *gave* (more on the systematic relationship between *gave* and *did ... give* presently). In 32a, that is, *what* is interpreted in the same way as *a double-edged axe* in sentence 32b. Similarly, in 33a, *whom* occurs in the first position of the sentence but is interpreted as the indirect object of the verb, that is as the Noun Phrase occurring in the final position of the sentence. This is to say that in 33a, *whom* is interpreted in the same way as *to the Hatter* in 33b. And in 34a, *When* is interpreted as a prepositional object, like *on a summer's day* in 33b.

But how could a *wh*-word occurring in the first position of a sentence be interpreted as a constituent following much later in a sentence? Note, to begin with, that there is a type of question, so-called **echo questions**, in which *wh*-words do actually occur in the position in which they are interpreted as occurring. To see this, consider the echo questions 35a - c, which correspond to the *wh*-questions 32a, 33a and 34a, respectively:

35a The Queen gave WHAT to the Executioner?

b The Knave sold the Queen's tarts to WHO(M)?

c The Queen made the stolen tarts WHEN?

Echo questions such as 35a - c are normally used by a second speaker to express disbelief, amazement and so on about something that has just been said by a first speaker. This second

speaker, repeating all or part of what the first speaker has said, uses a heavily stressed *wh*-word in place of the constituent whose meaning is the source of his/her disbelief or amazement.[26]

If sentences were simple word strings, echo questions would represent the expected case: words or expressions are interpreted in the position in which they physically appear. *Wh*-questions, by contrast, would represent the unexpected case: words or expressions are interpreted 'out of position'. As is pointed out by Noam Chomsky, however, it is common for expressions to be interpreted in a position different from the one in which they physically appear. In fact, Chomsky considers this kind of ('out-of-place') interpretation to be so pervasive and widespread a property of natural language that every theory of language has to 'capture' it somehow.[27]

From this phenomenon of 'out-of-place' interpretation, what do we learn about the structure of sentences? What we learn is this, to put it non-technically: phrases that are physically far apart can have a link between them which users of the language know about even though the link cannot be seen or heard. Technically, this is known as (a relationship of) **long-distance dependency**. For example, to be able to explain how *what* can be understood as the direct object of *give* in the *wh*-question 31a, the linguist may assume that there is an inaudible or invisible link between *what* and the socket in which the Noun Phrase interpreted as the direct object occurs. The linguist may assume, that is, that between *what* and this direct object NP there exists some long-distance dependency.

And just how far, you may well wonder, would a long-distance dependency be able to stretch? Quite a distance in linguistic terms, as the *wh*-question 35a shows when it is compared with the echo question 36b.

36a What does the Hatter say that the Queen thinks that the demoted Executioner should use for cutting down the barking tree?

b The Hatter says that the Queen thinks that the demoted Executioner should use WHAT for cutting down the barking tree?

Long-distance dependency is clearly a quite elastic sort of relation in that it can stretch over various phrases or clauses. In this, it reminds one of the extendable tail shared by Ping and Pang: this tail (inter)linked the two of them, and it could stretch at least twenty paces. Yes, it even allowed them to fight a duel with pistols, as witnessed by Alice:

> 'Alice watched the two Cats take up their positions back-to-back, with their tail curling up in the middle like a huge question-mark, and two very rusty old pistols clutched in their paws.' [*TNE* 37-38]

And:

> 'Though she felt she ought to urge them against fighting, Alice was simply too curious to know how Siamese-Twin Cats, attached at the tail, could possibly manage to march twenty paces away from each other. So she solemnly counted "One - two - three - four -": and as their tail gradually straightened out, then stiffened all over, she became more curious than ever.' [*TNE* 38]

Since their marching was abruptly ended by a thunder storm, Alice never found out just how elastic Ping and Pang's joint tail was. (Actually, despite the eighteen lives they had between the two of them, they had been hoping to be able to get a thousand paces away from each other for the pistol duel.)

Not having to contend with the disruptive intervention of events such as thunder storms, linguists have been able to learn quite a lot about the constraints on long-distance dependencies. Significantly, they have discovered that all long-distance dependencies in all languages are

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restricted by similar 'super-rules' or universal constraints. By analyzing sentences such as 37a - f, they have found out that long-distance dependencies cannot stretch from just any place in a sentence to just any other place in a sentence (in the following sentences *t* indicates the second position or terminal to which the dependency stretches, the first position being that in which the *wh*-word occurs):

37a *Whom did the Knight believe the King thought that the Hatter told the March Hare that the Queen would order the Executioner to behead *t* on the croquet-ground?

b *What did the Executioner wear a top hat and *t* for carrying out his duties?

c *Which Queen was the croquet game played on the day that *t* fired the intellectual Executioner?

d *What is for the Executioner to get *t* easy?

e *Which axe did the Queen hire a new Executioner who uses *t*?

f *What did Alice wonder who would get *t*?[28]

The *wh*-question 37a is an extremely complex sentence: it has no fewer than four (or even five) clauses, with the long-distance dependency stretching all the way from the first to the last. So one could say that this *wh*-question was awkward because the dependency was being 'overstretched'. In the case of 37b - f, however, it is a different story: these sentences are far less complex. This means that their ungrammaticality is caused, not by their "length" or rather degree of complexity, but by other aspects of their structure. The *wh*-word/expression has been moved out of a coordinate structure --- [a top hat and *t*] --- in the case of 37b; out of a sentential complement to a Noun --- [that *t* fired the intellectual Executioner] --- in 37c; out of a sentential subject --- [for the executioner to get *t*] --- in 37d; out of a relative clause --- [who uses *t*] --- in 37e; and out of an indirect question --- [who would get *t*] --- in 31f. Languages are subject to 'super-rules' or universal constraints which forbid moving a *wh*-word/expression out of these structures (or, alternatively, which say that long-distance dependencies cannot

stretch from a *wh*-word/expression at the beginning of a sentence to the position occupied by *t*).[29] But, to close this paragraph, let us repeat its two main points. Firstly, sentences are able to incorporate long-distance dependencies. Secondly, this ability of sentences makes them essentially unlike (simple) word strings. In a (simple) word string, after all, the words merely interlink neighbour-to-neighbour, like the links of a chain.

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5.3.4 Transformation

(Of grins and traces marking empty places)

'Out-of-place' interpretation and long-distance dependency, we have seen, are two sides of the same phenomenon. And we have noted that Noam Chomsky considers 'out-of-place' interpretation to be such a pervasive and widespread property of natural language that every theory of language has to 'capture' it. Chomsky's theory of language does this in a way that makes sentences even less like simple word chains --- which is the point we will be pursuing in this paragraph.

Here is the essence of Chomsky's proposal: in the case of a phrase that is interpreted 'out-of-place', there exists a relation of transformation between the position where the phrase is interpreted and the position where it physically appears. Specifically, he argues, there is an operation that (in some sense) moves the expression from the place of its physical occurrence to the place of its interpretation. In this latter position, moreover, this operation, called a **(syntactic) transformation**, leaves an inaudible and invisible copy of the moved phrase. This copy is called a **trace**, represented by the symbol *t*. What this involves in a concrete case, that of the *wh*-question 32a, is roughly shown in 38.

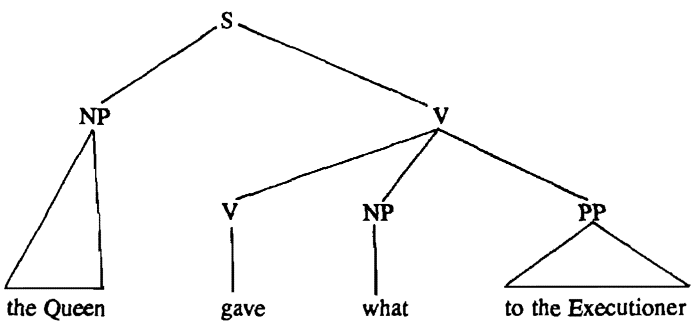
38 What did the Queen give *t* to the Executioner?
↑—*wh*-movement—┘

In 38, *wh*-movement represents the operation or transformation that moves *what* out of the direct object position --- where a trace *t* is left behind --- to the front of the sentence.[30]

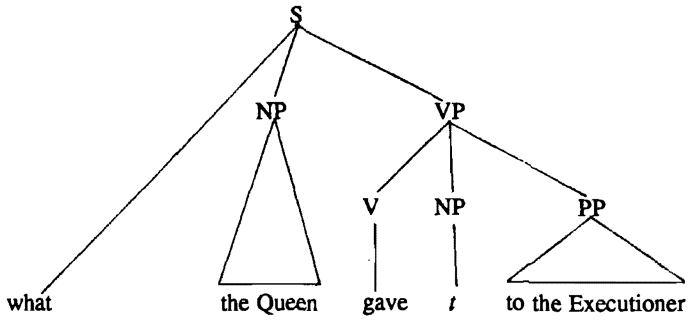
But 38 oversimplifies the matter in an important way, one that can be illustrated with the aid of the 'removement transformation' routinely carried out by the Executioner in the line of his duties. This operation --- beheading --- involves two states, a 'before' or input state and an 'after' or output state. In the 'before' state, the victim's head is in its original position; in the 'after' state, its head is in a '(re)moved' position. And if one wished to make a drawing of someone in these two states, a single picture would *not* be able to do the job. Two would be required: one of the 'before' state and one of the 'after' state.

Much of this carries over to syntactic (movement) transformations. Contrary to what 38 suggests, the movement operation in question involves two states: a 'before' or input state and an 'after' or output state. In the 'before' state *what* is in the direct object position; in the 'after' state, however, it is in the position at the front of the sentence. And these two states cannot be described with the aid of a single tree diagram. Two are required: one, such as 39a, to represent the 'before' state, and another, such as 39b, to represent the 'after' state.

39a



b



(39b has to undergo a further operation to replace *gave* by *did .... give*. We need not here, however, concern ourselves with this operation. Nor do we need to go into the nature of the socket that *what* is moved to or into the nature of the branch linking this socket to S.)

The important point illustrated by 39a and b is that the structure of *wh*-questions cannot be characterized with the aid of a single phrase structure tree alone. Two are required. The first --- exemplified by 39a --- represents what Noam Chomsky has called the **underlying** or **deep structure** of a *wh*-question. The second tree --- exemplified by 39b --- represents the **superficial** or **surface structure** of a *wh*-question. This means that *wh*-questions have a (different) structure at (each of) two **syntactic levels**. This idea has, moreover, been generalized by Chomsky to all sentences. In other words, *every* sentence has at least *two*, differing, syntactic structures: an underlying or deep structure (tree) and a superficial or surface structure (tree). The deep structure (tree) of a sentence is built by phrase structure rules. One or more **syntactic transformations** (or **transformational rules**) each move some phrase of the deep structure (tree) to form the surface structure (tree) of the sentence. A scientific description of a language which uses not only phrase structure rules but also transformational rules is called a **transformational grammar**.[31]

This brings us to two more ways in which sentences are not simple word strings --- that is, if Chomsky's theory of transformational grammar is correct. First, a simple word string is a

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single-storey string. In having both a deep and a surface structure, a sentence is by contrast a double-storey structure. Second, in a word string every link/word has to be physically there. A word string cannot contain 'missing' links/words. If a link/word is removed, the string is destroyed. Sentences, we have seen, are different in this regard too. A word like *what* can be moved out of its original position, without the sentence collapsing into a jumble of unconnected words. The 'vacated' position, as we have seen, is filled by a trace: a non-physical item that has been aptly characterized as 'a sort of unproduced pronoun'. Although traces are unpronounced (by speakers), listeners detect them when they process sentences and use them unconsciously in interpreting the *wh*-words/expressions in whose original positions the traces have been left behind. Traces assist listeners in understanding sentences by reminding them of the role --- direct object, indirect object and so on --- that the moved phrases are playing.[32]

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Traces, then, resemble the grin of the Cheshire Cat in a way:

> '"All right," said the Cat; and this time it vanished quite slowly, beginning with the end of the tail, and ending with the grin, which remained some time after the rest of it had gone.' [*AIW* 90]

As the Cat's grin marks the place from where it has disappeared, so traces mark the position from which *wh*-words have been moved. But traces are less curious things than the Cat's grin. Or at least would be to Alice, who thought:

> '"Well! I've often seen a cat without a grin ... but a grin without a cat! It's the most curious thing I ever saw in all my life!"' [*AIW* 90]

In Wonderland, grins could clearly be cut loose from 'grinners' to lead a life of their own. In sentences, however, there remains an invisible and inaudible link between a trace and the word or phrase whose trace it is. Otherwise people simply would not be able to interpret *wh*-

questions such as those considered above. It is this link, then, that makes it possible for Alice to correctly understand the Caterpillar's 'Who are *You*?', 'What do you mean by that?' and other *wh*-questions.

In sum: sentences differ in important ways from simple strings of words that are connected like links in a chain: (i) sentences are structured in a vertical or hierarchical dimension too; (ii) words are grouped in phrases, with the result that adjacent words may be structurally far apart; (iii) sentences exhibit discontinuities, with the result that non-adjacent words may be structurally closely linked; (iv) sentences contain long-distance dependencies, allowing words or phrases to be interpreted 'out-of-place'; (v) sentences have two levels of phrase structure; (vi) sentences can have building blocks that are not audible or visible. The vast majority of linguists will agree that sentences exhibit properties (i) - (iv). But about the status of (v) and (vi) linguists have disagreed amongst themselves in a way that makes one think of the battle fought by the Letters of the Alphabet in Needle's Eye World:

> 'First into the fray were the A's and the V's. They lunged out at each other, pointed edges to the fore, reminding Alice of some pictures she had chanced to see in one of their cousin's books, of Knights jousting in medieval tournaments. Then the K's started to snap at everything in sight with their sharp little jaws. The P's propelled themselves across the room like cannonballs, making a strange humming noise as they flew by. And the E's and I's combined forces by changing into tridents and puncturing all those letters, like the C's and G's and U's, whose soft curves made them vulnerable to their attack.' [*TNE* 179-180]

The battle about the existence of a level of deep structure, of transformational rules and of the traces left by such rules has of course been fought by supporters and opponents of Noam Chomsky. Recently, however, things have taken an interesting turn, with Chomsky himself exploring the possibility of eliminating both the level of deep and the level of surface structure.

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In his recent view, it is not conceptually necessary to attribute these levels of representation to language.[33] For Chomsky to take this new stance is on a par with Alice's telling the Letters of the Alphabet that what they have been fighting about is a non-issue. (According to Lord X, though, there was a real issue: '"Why ... must such fine, upstanding letters of the Alphabet as V, W, X, Y and Z ... always suffer because of our position in the scheme of things? Why ... must we always come *last*?"' [*TNE* 175-176])

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5.3.5 Pervasiveness of structuring
(In which sounds grow on trees)

Certain properties that distinguish a sentence from a simple word string are not restricted to syntactic structure. Interestingly, they characterize phonological structure too, which means that they are pervasive properties of language. We approach these properties by having a second look at the sentence which Alice had to utter so rapidly in order to get some service at the little shop selling stamps. Gilbert Adair, you may recall, represents this sentence as follows:

39 Idverymuchliketobuyapostagestampplease!

Now, 39 may suggest that a sentence or a word is a simple string of speech sounds at the level of phonology. This idea, however, would be wrong. Why?

Consider the word *argumentation* (it denotes a form of interaction at which Humpty, Alice and the Caterpillar excelled). Phonologically, this word is not a simple sequence of speech sounds represented (by the various letters) in 40.

40 a r g u m e n t a t i o n

Phonologically, rather, *argumentation* has the structure represented in 41.

41

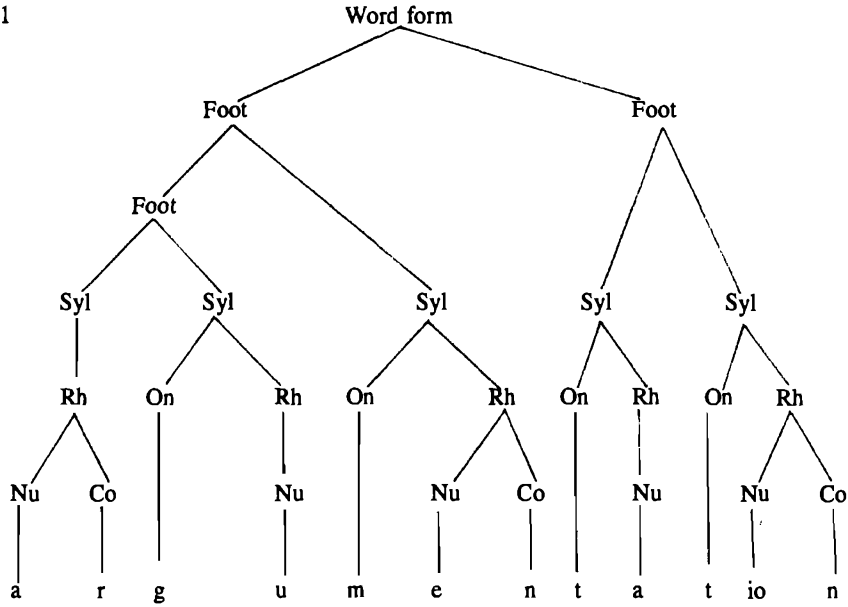

Diagram 41 makes it clear that, like the syntactic structure of a sentence, the phonological structure of a word has the shape of a two-dimensional tree (of the Looking-Glass kind). More concretely, words are made up phonologically in the following way:

- **Speech sounds** are pronounced in groups known as **syllables** (represented by 'Syl' in 41), which have two components: an optional **onset** ('On' in 41) and an obligatory **rhyme** ('Rh' in 41) which, in turn, is made up of an obligatory nucleus ('Nu' in 41) and an optional coda ('Co' in 41).
- A sequence of syllables consisting of a stressed syllable followed by one or more unstressed syllables is grouped into rhythmic units known as **feet**;
- Feet combine to make up **word forms**.

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The phonological structure of words, in a nutshell, has the form of a hierarchy in which smaller units are grouped at various levels or **tiers** into larger units. In short: hierarchies, groups and levels characterize the organization of both syntactic structure and phonological structure.[34]

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5.0 Use

(On what there is in common between the March Hare's house and the White Knight's song)

From the point of view of function, so we have seen, language is a means or procedure of converting messages into utterances and utterances into intended messages. And we have found language to seem quite productive as a means of doing this: in principle, it has been argued, there is no human thought or message that cannot be converted with the aid of language into an acceptable utterance and vice versa. Now, this productivity of language may understandably tempt one to conclude that the form of language must in the most fundamental respects be determined by function or use. Such a conclusion is mistaken, however, which is the point we will be taking up below.

5.1 Autonomy

(Of ear-shaped chimneys and fur-thatched roofs)

Lewis Carroll accommodates his dreamworld creatures in a variety of amazing houses. In Wonderland alone, there is the house with the hall that Alice could get out of through a fifteen-inch-high door only, the little house (only about four feet high) whose front door is watched over by a piscine footman, the house whose door is in a tree, and, of course, the March Hare's house:

> '... she [i.e., Alice] thought it must be the right house, because the chimneys were shaped like ears and the roof was thatched with fur.' [*AIW* 91]

Out of this funny house, one feels, Lewis Carroll could have gained a lot more dreamworld mileage. Particularly from the ear-shaped chimneys. Ears, of course, have a function: they are there for hearing, especially if they are as large as a hare's. But, for some reason, Lewis Carroll missed out on the opportunity of making the March Hare's house one that could hear and talk. A hearing and talking house would have been something really special. Just think of all the amazing things that such a house would be able to do: from eavesdropping to stonewalling! The ear-shaped chimneys of the March Hare's house are not, however, functionally well motivated features of the place. Their one and only function, in fact, is to identify ('(ear)mark') the house as the March Hare's, a point that we will return to below.

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Language has formal features that remind one of these ear-shaped chimneys, features lacking functional motivation. And some are of a quite significant sort. Such as structure-dependency. You will recall that, on Chomsky's view, structure-dependent rules are computationally more complex than structure-independent ones. And that Chomsky thinks a language using simpler rules --- simpler by virtue of being structure-independent or linear --- would be quite easy to construct. Significantly, Chomsky moreover thinks that:

> 'This language would function perfectly well for purposes of communication, expression of thought, or other uses of language.'

This means that, for Chomsky, the structure-dependency of language is not required by, and consequently is unmotivated in terms of, the functions and uses of language. But he nevertheless assigns structure-dependency the status of 'a significant, nontrivial property of human language'. No animal language is characterized by structure-dependency. This means

that structure-dependency plays the same role as the ear-shaped chimneys or the fur roof of the March Hare's house, that of discrimination. It sets language apart from other, non-human systems of communication, expression and so on.

Structure-dependency, you will recall, is a property of the general form of language. But this is not the reason why it lacks motivation in terms of the functions or uses of language. The shape of specific building blocks of language --- or 'structural components' of language as the Dodo would have insisted on calling them --- is similarly unmotivated from the point of view of function. As a case in point, take the rule for forming *wh*-questions. As regards form, it is a movement rule. But the meaning or use of *wh*-questions does not require a rule that performs a movement operation. *Wh*-questions would express their meaning, or perform their function, equally well if they were formally constructed in a completely different way. Like having (a normally stressed) *wh*-word or expression in the position of the questioned constituent. A *wh*-question formed in this way would differ from a corresponding echo question in regard to the degree of emphasis placed on the *wh*-word/expression only. As a matter of fact, some languages form their *wh*-questions in just this way. In Korean, for example, the *wh*-question corresponding to *Which college do you think that Chelsoo went to?* is the literal equivalent of *You Chelsoo which college went think?*, with the *wh*-expression *which college* appearing (unmoved) in the middle of the question.

As regards the direction of the movement carried out by the rule of *wh*-movement, one could equally well have a rule of *wh*-movement that moved the *wh*-word/expression to the end rather than to the beginning of the sentence. Which is to say that the direction of the movement is not required by the function or use of the rule. Similar observations may be made regarding the rule for forming *yes/no* questions, another rule whose function in no way requires it to be a movement rule.[35]

What has been said above about structure-dependency and about the two rules of question formation applies to much of the general form of language and the form of the specific structures used by it. Here is the essence of the matter: linguistic form is generally **autonomous** from function or use. Function or use and linguistic form are in general linked in an arbitrary way, as we have seen above in connection with individual words too.[36] To understand the qualification 'in general', let us return to the March Hare's house, with its ear-shaped chimneys and fur roof. This house would have been a lot queerer, had it belonged to someone else, to the Hatter for instance. Why? In a way, it is natural for a March Hare to live in a house with chimneys shaped like ears and a roof thatched with fur. These features of the house resemble certain features of the Hare. That is, certain features of the house and certain features of its occupant are linked by a relation of **iconicity**. This relation, of course, does not link the March Hare's house to the Hatter. A hat-shaped house would have been a more natural kind of dwelling for the Hatter.

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In restricted areas, linguistic form and meaning are likewise said to resemble each other or to be linked to each other in terms of iconicity. For example, in certain kinds of expressions, form and meaning resemble each other in a quantitative way: an increase in the form corresponds to an increase of what is referred to via the meaning. The **reduplicative constructions** or **reduplications** used by certain languages are a case in point. For example:

- A verb is reduplicated to express repeated or continued action. In Tzeltal, *-pik* means 'to touch it lightly'; *-pikpik* means 'to touch it lightly repeatedly'.
- A noun is reduplicated to express increased number or quantity. In Mandarin, *ren* means 'man'; *renren* means 'everybody'.
- An adjective is reduplicated to express greater intensity of a quality. In Thai, *dii* means 'to be good'; *dĭidii* means 'to be extremely good'.

In English, too, more form can signify more of what is meant. This is illustrated by the following sentences:

40a The cruel Queen has a passion for beheadings.

b The cruel, cruel Queen has a passion for beheadings.

c The cruel, cruel, cruel Queen has a passion for beheadings.

The expressions *cruel, cruel* in 40b and *cruel, cruel, cruel* in 40c are lexical repetitions: each repetition of *cruel* represents an increase in form which corresponds to an increase (or intensification) in what is meant.

The link between form and meaning in reduplications or repetitions is undeniably of a less arbitrary, more natural sort. Yet the kind of iconicity that we have here is extremely general and, therefore, quite weak. Note, firstly, that an increase in form may mean an increase not in one particular dimension only, but in various dimensions, including action, number, quality and so on. Secondly, the meanings 'continued or repeated action', 'increased number or quantity' and 'greater intensity in quality' can also be expressed by linguistic means other than the reduplication or repetition of a form. That is, these meanings are not linked by any necessity to forms created through reduplication. The meaning 'increased number', for example, can be expressed in a functionally arbitrary way by numerals (*two*, *ten*, *many*, etc.), by affixes (*-s*, *-en*), by syntactic phrases (*more than one*) and so on. Using any of these linguistic means in order to convey the meaning 'increased number' is like identifying the March Hare's house by putting a brass plate with the inscription 'March Hare' on its front door. Similarly, weak iconic features --- such as ear-shaped chimneys and a fur roof --- are not necessary means for identifying houses either.[37]

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5.4.2 Unusability

(Of the song 'A-sitting On a Gate' with the name 'The Aged Aged Man' called 'Haddocks' Eyes')

Ear-shaped chimneys will in all likelihood make for a pretty poor sort of chimney, unable to suck out smoke effectively. After all, such chimneys have not been designed for performing this function. Likewise, a fur roof may be rather useless when it comes to keeping a house dry. In general, it might seem, things whose form was not functionally fully motivated should not be expected to be highly usable. Is this so with language?

As far as productivity is concerned, we have found language to be a good instrument for converting messages into utterances and utterances into intended messages. But from other functional perspectives, language is 'unusable to a considerable degree' or 'badly adapted to use', according to Noam Chomsky. On the one hand, many expressions provided by our language cannot be easily 'handled' by what he calls our 'performance systems', that is by our speech production and speech comprehension systems. And it is not only highly complex sentences such as 41a that are hard to process; seemingly short and simple ones such as 41b and c are, too:

41a Never imagine yourself not to be other-wise-than what might appear to others that what you were or might have been was not otherwise than what you had been would have appeared to than to be otherwise. [*AIW* 122]

b The Queen hit the hedgehog hit it.

c Alice did not want the Cat not to promise not to vanish again.

You may recall that 41a was spoken to Alice by the Duchess, who went on to rephrase it as *Be what you would seem to be* in order to make it more understandable to the struggling Alice. 41b, in turn, is a reduced form of the more easily processible *The Queen who was hit the hedgehog hit the (same) hedgehog*. 41c is hard to process because of the complex way in which

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the three *nots* are interlinked. Clearly, language provides for a vast number of sentences that are very hard, if not impossible, to use.

On the other hand, Chomsky points out that unusability cuts across deviance. Some deviant or ungrammatical expressions are perfectly understandable, hence usable. This is illustrated by such utterances as those produced by the Diamonds, whom we met in par. 4.3.2 above:

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42a *It's a quarrelling gardeners, they are.

b *The Cook remembered when she hurts herself the other day.

c *The Gardeners paint four rose.

Conversely, there are non-deviant sentences that are quite hard to understand. Many grammatical sentences pose conceptual difficulties that speaker-hearers cannot solve in their stride. To convince yourself of this, do have a go at interpreting the following sentences (which are about (the name of) a melancholy song sung by the White Knight):

43a Though the name of the song is called *Haddocks' Eyes*, the song's name really is *The Aged Aged Man*.

b Though the song's name really is *The Aged Aged Man*, the song is called *Ways and Means*.

c Though the song is called *Ways and Means*, the song really is *A-sitting On A Gate*.

d Though the song is called *Ways and Means*, the name of the song is called *Haddocks' Eyes*.

Perhaps, like Alice, you may find these sentences hard to understand, even though none of them are ungrammatical. Nor do any of them pose perceptual problems of the kind that arise in the processing of sentences 42a-c.

Why, then, are sentences 43a-d so hard to interpret? The problem, you may think, is one of contradiction. Considered individually, each seems to contain an internal contradiction. And, considered collectively, they seem to contradict each other. The actual problem, however, is not one of contradiction, a point which emerges from the following conversation between Alice and The White Knight:

> '"The name of the song is called *Haddocks' Eyes*" [said the Knight]
> "Oh, that's the name of the song, is it?" Alice said, trying to feel interested.
> "No, you don't understand," the Knight said, looking a little vexed.
> "That's what the name is *called*. The name really *is* '*The Aged Aged Man.*'"
> "Then I ought to have said 'That's what the *song* is called'?" Alice corrected herself.
> "No, you oughtn't: that's quite another thing! The *song* is called '*Ways And Means*': but that's only what it's *called*, you know!"
> "Well, what *is* the song, then?" said Alice, who was by this time completely bewildered.
> "I was coming to that," the Knight said. "The song really *is 'A-sitting On A Gate'*: and the tune's my own invention."' [*TLG* 306]

From this intriguing interchange, it is clear that the sentences 43a-d are contradictory neither individually nor as a group. Rather, understanding them is hard because of the way they tax our conceptual system. Specifically, to be able to understand them, we have to draw a series of rather fine conceptual distinctions, including the following three:

- the *name* of the song vs. the *song* itself;
- what the name *is* vs. what the name *is called*;
- what the song *is* vs. what the song *is called*.

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If these distinctions are 'kept in mind', the meaning of sentences in 43a-d can be worked out. But there lies the rub. 'Keeping these distinctions in mind' requires extremely hard conceptual labour. Which is to say that sentences 43a-d, though grammatical, fall short of being usable.

Had language been fully usable, we would not have the cross-classification illustrated above: deviant sentences would be relatively hard to understand, hence relatively unusable. And nondeviant sentences would be relatively easy to understand, hence usable. Chomsky, incidentally, does not consider the unusability of language to interfere with linguistic communication. Speakers and hearers have similar languages and performance systems. So it is generally the case that, what speakers can say, hearers can understand.[38]

To sum up, we need to note two contrasting points. On the one hand, language is strikingly productive in having the potential to match any message or thought which someone can conceptualize with an acceptable utterance and vice versa. On the other hand, language is less than fully usable in that its productive potential provides for many pairings of messages and utterances that the performance and conceptual/cognitive systems of speaker-hearers cannot readily process.

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5.5 Substance

(*In which Alice tries to fancy what a candle flame looks like after it's been blown out*)

Whilst pausing for refreshments in the course of their fight for the King's crown, the Lion and the Unicorn met Alice where she was having a conversation with the King and his Messengers. Both fighters were more than a bit puzzled about what Alice was:

> '"What's this!" [the Lion] said blinking lazily at Alice, and speaking in a deep hollow tone that sounded like the tolling of a great bell.

> "Ah, what *is* it, now?" the Unicorn cried eagerly. "You'll never guess! I couldn't."
> The Lion looked at Alice wearily. "Are you animal - or vegetable - or mineral?" he said, yawning after every other word.' [*TLG* 289]

The Lion's second question illustrates another one of the dimensions that one has to take into account when trying to come to grips with the nature of something: the dimension of **substance** (or stuff). Below, then, we will be concerned with the question 'What is the substance of (a) language?' (We won't find it --- I can assure you --- to be animal, vegetable or mineral! Nor a 'fabulous monster', a fourth possibility suggested by the Unicorn with reference to Alice.)

The ingredients of the world of language that we have examined so far vary in regard to substance. Some of these linguistic entities are physical ones: the signals of spoken utterances, for example, are phonic in substance. Others we have found to be mental ones: the various language capacities form part of the human mind. Still others are compound in regard to substance: the intentional acts making up language behaviour are complex in having both a mental side (made up of the stuff of intentions) and a physical side (made up of the stuff of actions). In short, the world of language draws its substances from various **ontological domains**, including the physical and the mental.

But what is the substance of (a) language itself? Many scholars will consider this to be an open question. The divergent answers suggested to it are too complex to survey and appraise here. Since much of the recent discussion has been stimulated by Noam Chomsky's thinking, let's consider this in outline.[39]

Chomsky's position on the nature of (a) language includes two basic ideas that bear directly on the question about the substance of language. On the one hand, he considers language to be something **mental**. He arrives at this position by identifying language with knowledge of language, which he takes to be a cognitive system represented in the mind. More specifically,

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as we saw in par. 4.2.3, a speaker-hearer's knowledge of a particular language is considered by Chomsky to be an attained state of a certain mental faculty: the language faculty. This means that Chomsky considers a particular language such as English to be something mental in regard to substance. The same goes for language in general. In par. 4.3, we saw that what is loosely called 'language in general' is taken by Chomsky to be somehow embodied in the language acquisition capacity. In his thinking, this capacity is simply the initial state of the language faculty.

On the other hand, Chomsky considers the possibility of language being something **abstract**. In particular, he explores the idea that language is an abstract object, the object of knowledge of language. As an abstract object (a) language, for Chomsky, is an image of the generative procedure represented in the mind. By means of the term 'abstract', Chomsky wishes to indicate, firstly, that a particular language is abstracted (or 'drawn off') from the attained state of the language faculty and, secondly, that language in general is abstracted from the initial state of this faculty. It is, however, unclear to Chomsky whether the step of abstracting (a) language from a state of the language faculty is motivated. His doubts spring from his assumption that the properties of (a) language are determined completely by those of the relevant state of the language faculty. For Chomsky, accordingly, (an) abstract(ed) language is not characterized by any properties or principles that do not also characterize the mental state that it has been abstracted from.[40]

But suppose that (a) language were an abstract object. What could its substance then be? What is the nature of the stuff denoted by 'abstract(ness)'? Obviously it cannot be nothingness, the nature of which Alice contemplated with some alarm when suffering yet another bout of severe shrinking:

> 'First, however, she waited for a few minutes to see if she was going to shrink any further: she felt a little nervous about his; "for it might end, you know," said Alice to

> herself, "in my going out altogether, like a candle. I wonder what I should be like then?" And she tried to fancy what the flame of a candle looks like after the candle is blown out, for she could not remember ever having seen such a thing.' [*AIW* 32]

Nor does 'abstract(ness)' in the sense used by Chomsky denote the substance of objects that are abstract in a Platonic sense. Such objects --- including ideas such as 'The Good', 'The Beautiful' and 'The Just' --- are taken to be neither physical nor mental. They are spaceless; they are placeless; they are timeless; they do not change; they can neither be caused by something nor cause anything. Some mathematicians believe numbers to be entities of this abstract Platonic sort. And some linguists have put forward the view that sentences are such abstract objects, taking languages to be collections of sentences. Chomsky, however, has rejected this view for various reasons, two of which are particularly relevant here. First, he sees no plausibility in the idea that languages can exist as Platonic objects independent of mental states of individuals. How people would be able to acquire and use languages if they were abstract Platonic objects is not clear. Nor how languages would be able to change, which they do all the time. Second, Chomsky argues that the collections made up by sentences --- i.e., the individual languages --- do not have clearly defined boundaries. He observes that it is unclear in the case of many semi-grammatical expressions --- e.g., *Give it me*, *The child seems sleeping* --- whether they are inside or outside the set of sentences supposed to make up a language.[41]

There are also non-Platonic ways of thinking of abstract objects. But it has not yet proved possible to coherently portray language as something abstract in terms of any of these. Which leaves us in a rather uncomfortable position if we find that it makes conceptually good sense to think of language as an object of knowledge, an object that has been abstracted from a mental state. An object that has been abstracted from a mental state could hardly be something mental itself. The abstractness arrived at in this way is as hard to "picture" as the nowhereness with which Tweedledee operates:

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'"He [= the King]'s dreaming now, said Tweedledee: "and what do you think he's dreaming about?"

Alice said: "Nobody can guess that."

"Why, about *you*!" Tweedledee exclaimed, clapping his hands triumphantly.

"And if he left off dreaming about you, where do you suppose you'd be?"

"Where I am now, of course," said Alice

"Not you!" Tweedledee retorted contemptuously. "You'd be nowhere. Why, You're only a sort of thing in his dream!"' [*TLG* 238]

Which isn't to say that language is made of the same stuff as entities in the dreams of people who have woken up! (What would the substance be of the language spoken by such people in their dreams?)[42]

Suppose that Chomsky's first idea is right. Suppose, in other words, that language is something mental. What would be the nature of mental stuff? How would mental stuff differ from material stuff or, for short, matter? Recently, Chomsky has addressed these and related questions from an interesting and unusual perspective. To begin with, he denies that the mental is some 'ghost-like' substance which is distinct from matter. And he denies that the mind is distinct and separate from the body (or brain). To be able to maintain this view, he argues, one must have a definite, properly-demarcated concept of 'body' and of 'matter'. The Cartesians had such a concept. It took the form of a kind of contact mechanics that was restricted to the ways in which physical entities interact by pushing, pulling, colliding and so on. Only entities that interacted in such ways were considered to be material or 'bodily' entities.

But this concept of 'body' collapsed when Isaac Newton (1642 - 1727) put forward his theory of physical phenomena --- a theory justly famous in its day for the correctness of its highly precise predictions, for its conceptual coherence and for the comprehensiveness of its factual

coverage. The Cartesian concept of 'body' collapsed because Newton, in order to account for phenomena as (seemingly) diverse as the tides of the sea and the motions of the planets, appealed to a principle of 'action at a distance'. Such action is caused by a force that could not exist within the limits of Cartesian mechanics, that is within what is possible in terms of the Cartesian concept of 'matter' or 'body'. And, indeed, this force was at first believed to be a 'mysterious principle', or worse, an 'occult force'. No doubt you find that belief curious. After all, even Alice, who is only a young girl, understands her plunge down the rabbit hole as an event governed by the law of gravity. But then, you see, both you and Alice benefit from a discovery made only relatively recently: that the problem lies not in the 'occultness' of the force of gravity but, instead, in the limitations of the Cartesian theory of matter or the body.

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So the Cartesian theory of matter has been abandoned. Its abandonment, what is more, has a consequence which is highly important to us. Here is how this consequence is described by Chomsky:

> 'We no longer have a definite concept of body. Rather, the theory of body - or physics - now includes whatever concepts are necessary to account for events in the physical world: forces, massless particles, waves, strings in 10-dimensional space, or whatever. We can therefore no longer coherently ask whether some phenomenon falls outside the range of 'body'. We can only ask whether our current concepts of 'body' are adequate to account for this phenomenon;....'[43]

This means that we now have an open-ended concept of 'body' or 'matter'. And whatever scientists discover in the pursuit of normal scientific practice about the body or the mind becomes part of matter or the material world. Hence, it is not possible to take the mental to be a substance distinct from the material.

Language, accordingly, is something material in Chomsky's recent thinking. And, from this perspective, the language faculty is part of the body, a conclusion which may come as a surprise to the White Knight and people sharing his views on the relation between the mind and the body. As you may recall, this Knight --- the one whose mind goes on working even when he hangs head down into ditches --- believes that one talks with one's mind rather than with one's body. But if one's mind turns out to be part of one's body, ...[44]

5.6 The macroscope

(On what happens when senses are aided by lenses)

Perhaps you have been wondering all along why we have looked above at language(s) from the perspective of certain dimensions rather than others. And why, within the former dimensions, we have focused on certain properties rather than others. For instance, why haven't we considered language(s) from the perspective of diversity? From this perspective, we would find language to be manifested in a rich profusion of varieties: full individual languages, social and regional dialects, idiolects, styles, registers, sublanguages used by certain professions, recently born marginal languages such as pidgins, simplified languages of children still in the process of acquiring their mother tongue, interlanguages developed by people in the process of acquiring a second language, the language-in-attrition of people unlearning a first or second language, dying languages with a rapidly dwindling number of speakers and so on. Surely, in view of such diversity, **variability** might have been considered for membership of the class of salient properties of language? Or, to take another example, why haven't we looked at language(s) from the perspective of change? If we did, we would find languages to be changing all the time; so, another candidate for the status of salient property might well have been **changeability**.[45]

To arrive at answers to questions such as these, it won't help us to study the nature of language more closely. Rather, we have to inspect the macroscope through which we have studied language. Such inspection will reveal it to be a macroscope of a particular design: one fitted with Chomskyan lenses. Which means that we have conducted our macroscopic study of language(s) --- and of various other important architectural features of the world of language --- within a conceptual framework compatible with Noam Chomky's thinking. And this thinking focuses more sharply on certain dimensions (e.g., form and structure) and certain properties (e.g., structure-dependency and long-distance dependency) than on other dimensions (e.g., diversity and change) and other properties (e.g., variability and changeability). The former dimensions and properties, Chomsky believes, are more crucial than the latter ones to our understanding of the nature of language(s).

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This belief may of course be wrong. Which implies that, as we peer through our Chomskyan macroscope, we run the risk of getting an unfocused, blurred or distorted image of the nature of language(s). Risks of this kind, though, are by no means unique to Chomskyan linguistics. We run such risks whenever and wherever we study objects that we cannot inspect directly by using our senses only. Language and languages are just such objects: they cannot be studied without the aid of finely ground conceptual lenses. And it is simply impossible to grind conceptual lenses in a way that will guarantee their users some distortion-free, 'completely neutral', image of the objects under investigation.

For inspecting language(s), Chomskyan macroscopes --- and microscopes as well --- are among the best that one could use at present. As has been noted by John Lyons, a linguist respected for his balanced judgement:

> '... the influence of Chomsky's thought continues to be dominant in any branch of linguistics that aspires to theoretical status.'[46]

And:

> '... his [i.e., Chomsky's] work has inspired, and continues to inspire an immense amount of research and discussion in any and every discipline that bears at all on the nature of language and mind.'[47]

These comments of Lyons's lead us right on to the link between Noam Chomsky and Lewis Carroll: considered from the viewpoint of creativity, they are 'two of a kind'. When it comes to designing dreamworlds, Lewis Carroll is in a class of his own. Which is just what Noam Chomsky turns out to be when it comes to designing conceptual lenses for the study of language(s).

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6 Its Baffling Birth

> *'"Take off your hat," the King said to the Hatter.*
> *"It isn't mine," said the Hatter.*
> *"Stolen!" the King exclaimed ...*
> *"I keep them to sell," the Hatter added as an explanation: "I have none of my own. I'm a hatter."' [AIW 147]*

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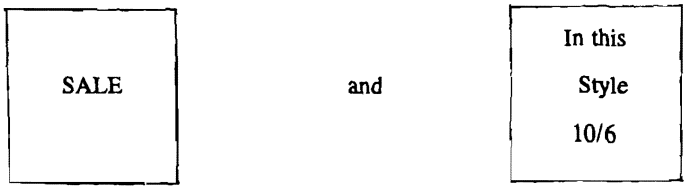
In true Looking-Glass fashion, we have kept the beginning for the end. In these few closing paragraphs, that is, we will briefly look at the world of language *from* a **phylogenetic perspective**, trying to get some idea of how language might have originated. In so doing, we will be taking up a point first raised in par. 5.4.2 above: that language is less than fully usable. This point triggers two questions (at least). First question: could language be said to have been designed for any particular function or purpose? Second question: if so, who or what could have been language's designer? Below we will consider *in outline* two positions recently put forward as rival answers to these interesting but perplexing questions.

To approach the two positions, let us have a look at some of the hats specially designed by the Hatter, and let's compare these special hats with the March Hare's ears. As drawn by Sir John Tenniel, the first illustrator of the Alice stories (and the most famous), the Hatter's special hats are generous affairs, high top hats that cover his head amply and cover much of his shoulders into the bargain. The (upright) sides of the crown are particularly striking. So expansive are these sides that the Hatter uses some of them for publicity purposes; he pins notices on them that read like this:



And then there are a few *very* special top hats, which unfortunately Tenniel never got round to drawing. Unfortunately, because with these superspecial specimens the Hatter uses the ample sides of the crown as areas on which to express his whimsical artistic talent. Some sides he covers with schizoid self-portraits. Other sides he covers with quaint drawings of the March Hare, the Dormouse and Alice drinking tea from tiny bowler hats. And so on.

Looked at from the viewpoint of design, the ample upright areas of the Hatter's top hats --- special and superspecial --- are no more than by-products. That is, they are automatic results of the requirement that any top hat has to have its top well above its brim. Contrary to what you may have been thinking (excusably enough), the Hatter does not intentionally design these hats to have large upright areas useful for promotional, expressive or decorative purposes. One fine day, it just strikes him that these areas have this potential; so he begins to use them for promotional, expressive and decorative purposes. This absence of intention also explains why, to the Hatter, neither the top hats with the most eye-catching self-advertisements nor the top hats with the quaintest drawings count as the cream of his professional creations.

We turn next to the March Hare's ears. In general, of course, one cannot help noticing that the external part of a hare's ears is enormous in relation to its head. Indeed, from the viewpoint of size, a hare's outer ears are as striking as the vertical sides of the special top hats designed by the Hatter. But for different reasons. That is, for a hare's external ear to be as big as it is is no accident. On the contrary, it has been (somehow) designed to be so big in order to serve a particular function: the function of picking up even the faintest of noises. The great size, in other words, of the outer part of a hare's ear heightens the acuteness of the animal's sense of hearing. This capacity for highly acute hearing has been vital, directly, to the individual survival of countless hares and thereby, indirectly, to the collective survival of the species. The sooner a hare is able to hear any noises that signal danger, the sooner of course it can hide or flee --- and the better its chances of living to tell the story to its children and grandchildren. If

the designer of hares' ears has to pick out his/her/its best creations, the choice is sure to fall on those ears that are largest.

But, you may well ask, how are these remarks about hares' ears and top hats to help us come to grips with positions on the design of language? Well, on one of the positions alluded to above, language has in fact been designed for the particular function it serves. Accordingly, on the one hand, language is like the external part of hares' ears. On the other position, language has not been designed for (any of) the functions it serves. Accordingly, on the other hand, language is like the upright areas of one of the Hatter's special top hats. For easy reference, let us label these respective positions the 'Hare's Ear Position' and the 'Top Hat Position'.[1]

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Fundamental to both positions is the belief that language is something biological. In particular, language is identified with a certain kind of cognitive system or mental capacity: a genetically based language faculty, referred to by some as the 'language acquisition capacity'. In support of this belief, considerations such as the following are put forward:

- Children know more of their language than they can possibly have learned.
- Some language disorders are genetically transmitted.
- Certain aspects of knowledge of language and, similarly, certain aspects of the ability to use knowledge of language can be linked to specific regions of the human brain.[2]

Although the two positions mentioned above agree on the biological nature of language, on the origin of language they differ sharply. On the Hare's Ear Position --- as espoused by Steven Pinker and Paul Bloom, for example --- language is necessarily a product of natural selection. Like the external part of a hare's ear (or like the 'vertebrate' eye), language is believed to have

been designed by natural selection for a specific function. On the Top Hat Position --- versions of which have been articulated by for example Noam Chomsky, Stephen Jay Gould and Massimo Piattelli-Palmarini --- language is in all likelihood a by-product of some evolutionary process other than natural selection. Like the upright areas of the Hatter's 'superspecial' top hats, language is believed not to have been designed for the functions in which it has come to be used. But let us look a bit more closely at some of the basic assumptions/ideas that make up the Hare's Ear Position and the Top Hat Position, respectively.

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Central to the Hare's Ear Position is the assumption/idea that language has the property of **adaptive complexity**. A (biological) structure or system is said to have this property

(a) if it is made up of many interacting parts and

(b) if these parts have been designed (or appear to have been designed) to serve some function or purpose. (As an instance of such a 'purposefully designed' part, the hare's outer ear interacts with both its middle and its inner ear.)

Language, it is believed, is a system whose parts show signs of having been designed for the communication of propositional structures through a serial channel. Phrased in more familiar terms, this is roughly the view that language has been 'made' for a purpose: the purpose of mapping (certain) nonlinear conceptual structures (or meanings) on to linear utterances (or stretches of noise), and vice versa. It is for this purpose, then (so it is claimed), that language has developed structural means such as lexical categories, phrasal categories, phrasal rules, rules of linear order, case affixes and so on. For example, distinctions among lexical categories (e.g., noun, verb, adjective, and preposition), (so it is assumed) serve to help communicate information about distinct real-world categories of entities (e.g., things, events, states, qualities, relations).

A system that has the expressive power of language is useful in at least one definite way: it enables those who possess it to communicate among themselves information which is important to their survival and reproduction. For example, the Wonderlanders who/which are good at conveying and receiving bits of information such as 1 - 3 below have an obviously better *chance of surviving (the Queen's wrath) and reproducing* themselves than do those that are no good at such communication.

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1 If you beat the Queen at croquet, you get your head chopped off.

2 By taking a sip from the bottle labelled 'Drink Me', you can become invisible to the Queen when she is in a foul mood.

3 You can bribe the Executioner to perform fake beheadings.

In terms of the Hare's Ear Position, there is only one physical process --- namely natural selection --- which would be able to cause language to develop in the human species. **Natural selection** is standardly characterized as a process in the course of which small, random, modifications in a biological structure or system are retained across generations of individuals making up a population because these modifications improve the individuals' chances of surviving and reproducing. Natural selection involves what has been called 'the survival of the fittest'. The fittest members of each generation survive to pass on their characteristics to their offspring, including of course the characteristics that make them so fit. These 'fit-making' characteristics include 'being good at sensing danger', 'being good at fleeing or hiding', 'being good at fighting', 'being good at finding food', 'being good at mating' and --- on the Hare's Ear Position --- 'being good at communicating verbally'. On the Hare's Ear Position, in sum, the designer of human language is natural selection.[3]

The correctness of the Hare's Ear Position has been questioned on fundamental points. To illustrate, two instances should do. The first instance involves the **diversity of language**. In particular, the formal means used by languages and the expressive functions served by languages are not paired in a one-to-one way. Consider the function of conveying thematic information about who did what to whom and so on. Some languages use word order as the formal means by which to convey this kind of information. For example, in a simple declarative English sentence with normal word order, the first Noun Phrase (NP_1) identifies the Agent (the 'who'), the second one (NP_2) identifies the Patient (the 'what'), and the third one (NP_3) identifies the Benefactive (the 'who to/for').

4 The Messenger gave the hay to the White King.
NP_1 NP_2 NP_3

Some languages, however, do not use word order for this function; rather, the formal means they use is one such as case. Latin, for example, uses nominative case (Nom) for identifying the Agent, accusative case (Acc) for identifying the Patient, and dative (Dat) case for identifying the Benefactive. As a result, Latin word order is far more flexible than English word order. Alternative orderings of exactly the same words thus become a formal means of reflecting different emphases. (5) below for example is a relatively unemphatic rendering of our English specimen sentence. (6), however, by placing *albo* 'to (the) white' first, implicitly contrasts the White King with the Red King. (In 5 and 6, the affixes marking the various cases are represented by bold letters.)

5

Nunti+**us**	Reg+**i**	Alb+**o**	faen+**um**	dedit
messenger + Nom	king + Dat	white + Dat	hay + Acc	he gave
NP_1	NP_2		NP_3	

'The messenger gave the hay to the White King.'

6	Faen+**um**	Alb+**o**	Nunti+**us**	Reg+**i**	dedit
	hay + Acc	white + Dat	messenger + Nom	king + Dat	he gave
	NP_3	NP_2	NP_1	NP_2	

'It was the hay that the messenger gave to the White King.'

This kind of diversity causes the following problem for the 'Hares': How could any particular formal means --- such as word order or case --- have evolved under the pressure of natural selection if in some languages *this formal means is not* used at all? Or if in other languages this same formal means is used in a marginal way only?

There is another matter that poses a problem for the Hare's Ear Position. It involves the **arbitrariness** of important aspects of linguistic form. We have seen, as you may recall from par. 5.4.1, that structure-dependency is not required for --- and therefore is not motivated by --- any of the functions of language. Yet structure-dependency has been judged by no less a linguist than Noam Chomsky to be 'a significant, nontrivial property of human language'. So, then, why would human language have properties that are nontrivial but that do not serve any function which is important within the framework of natural selection? And how could language have developed such properties if it was designed by natural selection? These and related other questions represent a serious challenge to advocates of the Hare's Ear Position.[4]

But does the Top Hat Position offer an account of the genesis of language which is less problematic? Denying that language has been designed for some function or purpose by natural selection, this position portrays it as a by-product or side-effect of nonselectional forces involved in the evolution of biological structures. It is instructive to consider Noam Chomsky's formulation of this point:

> 'These skills [i.e., language learning skills based in the language faculty] may well have arisen as a concomitant of structural properties of the brain that

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> developed for other reasons. Suppose that there was selection for bigger brains, more cortical surface, hemispheric specialization for analytic processing, or many other structural properties that can be imagined. The brain that evolved might well have all sorts of special properties that are not individually selected; there would be no miracle in this, but only the normal workings of evolution. We have no idea, at present, how physical laws apply when 10^{10} neurons are placed in an object the size of a basketball, under the special conditions that arose during human evolution.'[5]

As we have seen in paragraph 4.3.2, the initial state of the language faculty --- which embodies the language acquisition capacity --- is considered a genetically determined property of the human species. For a property to be genetically determined, however, is not for it to be necessarily a result of natural selection. In Chomsky's book, natural selection is but one of the possible sources of genetically determined properties. Other sources, in his view, include (i) (unknown) physical laws affecting 'neuron packaging', (ii) spin-offs or side-effects of the selection of other properties, (iii) mutation, (iv) genetic engineering and so on. Identifying the source of a particular genetically determined property is, as Chomsky sees it, an empirical task. And he sees no reason to suppose that language --- identified with the initial state of the language faculty --- must be a product of natural selection. Rather, he seems to favour the idea that the language faculty has originated in an accidental way as an emergent property of a brain reaching a certain level of complexity. In terms of such an idea, (the) human language (faculty) is --- simply --- a by-product of certain physical laws that governed the human brain's evolution.[6]

The Top Hat position would also have serious problems to face up to. For example, the physical laws of which language is claimed to be a by-product have not so far been identified by any of the 'Hatters'. The evolution of language, in short, is still an essentially unknown process. Moreover, (biological) structures that can do what the language faculty can do have

been claimed to be 'extremely low-probability arrangements of matter'. If true, this means that the language faculty is highly unlikely to have originated in an accidental way as a by-product of a development such as an increase in the size of the brain.[7]

So, where does all of this leave us? Has language been designed by natural selection for a particular function, like a hare's ear? Or is language, like the expansive sides of the Hatter's special top hats, an --- incidental --- by-product of other forces? Or perhaps language didn't originate either like the Hatter's special top hats or like the hare's ear? Fortunately the jury on these questions is rather more competent than the odd collection of creatures responsible for deciding whether the Knave was guilty of stealing the Queen's tarts on that fateful summer's day; unfortunately, it is still out on these questions. The questions before it are hard ones, not least because language originated in the distant past: a past about which there is a dearth of data. Moreover, scholars pursuing these questions do not agree on the tools --- including the conceptual frameworks and argument forms --- that should be used for unravelling the genesis of language. Progress is consequently bound to remain modest unless these scholars can come up with a new kind of 'scope': one that will enable them to 'see' more clearly and 'eye to eye' into an opaque past.[8]

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Notes

1 Of Scopes: Micro- and Macro

1 The two Carroll stories that will figure prominently in my account are *Alice's Adventures in Wonderland* [to be referred to also as *AIW*] and *Through the Looking-Glass and What Alice Found There* [to be referred to also as *TLG*]. These references will be to *The Annotated Alice*, Penguin Books, 1965.

2 In addition to drawing on the two Alice stories written by Lewis Carroll, I will make use of Gilbert Adair's *Alice Through the Needle's Eye* [to be referred to also as *TNE*] (London: Macmillan. 1984).

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1 For this terminological distinction see Lyons 1977:26.

2 For a review of some of the problems that make it difficult to give a rigorous characterization of the nature of utterances (as products), see, for example, Lyons 1968:171-172, 1981b:23-26.

3 For some discussion of the properties and functions of (various types of) linguistic silences, see, for example, Crystal 1987:172, Levelt 1989:35-37, 126-128, Poyatos 1993:135-137, Wardhaugh 1992:237-241 and the literature reviewed in these sources.

4 For some discussion of the nature of speaking and writing, see par. 3.3.2.

5 For some discussion of the properties of signed utterances, see, for example, Crystal 1987:220-225, Padden 1988, Sandler 1993, Siple 1982, and the contributions to Fischer and Siple (eds.) 1990. For a readable account of the properties of signed languages, see Jackendoff *1994:* chap. 7.

6 For some discussion of the properties and functions of such gestures, see, for example, Crystal 1987:402-403, and Graddol, Cheshire and Swan 1987:135-137.

7 For some discussion of the relation between written and spoken utterances, see, for example, Olson 1993 and the literature reviewed there. We will return to the relation between speaking and writing in par. 3.3.2 below.

8 For some discussion of the distinction between utterances as physical entities and sentences as nonphysical entities, see, for example, Allan 1986:55-58, Bromberger 1989, Burton-Roberts 1985, Carr 1990:43-44, Katz and Postal 1991:522-523 and Lyons 1981b:23-26. Various linguists --- for example, Katz and Postal 1991:522-523 and Lyons 1977:13-18 --- invoke the distinction drawn by Peirce (1933, Part IV:423-424) between types and tokens as the basis for their distinction between utterances and sentences. In terms of Peirce's distinction, a type is a significant form that does not exist but that determines things that do exist. A token results from the use of a type and is a sign of the type. A token, moreover, is something 'Single': '[a] Single event which

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happens once and whose identity is limited to one happening or a Single object or thing which is in some single place at any one instant of time, such event or thing being significant only as occurring just when and where it does, such as this or that word on a single line of a single page of a single copy of a book ...' (Peirce 1933, Part IV:423).

9 For the nature of the meaning of utterances (or utterance-meaning) and the way in which it is related to the meaning of sentences (or sentence-meaning), see, for example, Lyons 1977:33ff., 1981a:163ff., 1981b:28, 171ff. For a survey of alternative conventional conceptions of what meaning is, see Allan 1986:75ff.

10 For a discussion of the nature of linguistic intuitions, see, for example, Botha 1968:69ff. To the question of how people make intuitive judgements of utterances we will return in par. 3.3.1.3 below.

11 For some discussion of these questions, see, for example, Botha 1973:173ff., 1981:57ff., 227ff. and the references furnished there.

12 For recent discussions bearing on this point, see, for example, Botha 1992:132-137, Fodor 1985:147ff., Katz and Postal 1991.

13 For some discussion of general properties of texts and discourses, see, for example, Brown and Yule 1983, Levinson 1983, Lyons 1981b:195ff., Prince 1988. Both *text* and *discourse* are used in a number of different senses. Here we will note just one source of possible confusion. Like *utterance*, both *text* and *discourse* are used ambiguously in a product sense and/or an action or process sense. Above, these terms are used to denote cohesive sequences of utterances as products, not the (bits of) action or processes by means of which the collections of utterances are produced. For this product vs. process distinction, see, for example, Brown and Yule 1983:23-25.

14 For some discussion of the ways in which sentences have to be interrelated to form a cohesive collection or text, see, for example, Brown and Yule 1983:190ff., Chafe 1982, 1985, Chafe and Danielewicz 1987, Halliday and Hasan 1976, Traugott and Pratt 1980:31-24.

15 For Reverend Farrar's experiences, see Mühlhäusler 1986:23.

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3 Its Behavioural Belt

1 Behaviour has turned out to be extremely difficult to characterize adequately in technical terms of any generality. For a discussion of some of the characterizations that have been proposed, see, for example, Botha 1992:73-74, Kaufmann 1967:269, and Moravcsik 1990:61.

2 For the notion of 'internal' or 'silent speech', see, for example, Levelt 1989:12-15, 27-28, 469-473 and the literature surveyed there.

3 This utterance is a lexically slightly modified version of an utterance that was actually produced by a schizophrenic patient. For the latter utterance, see Maher 1966:395. For some discussion of the utterances (or so-called language) of schizophrenics, see, for example, Chaika 1974, Maher 1966, Schwartz 1982 and the 'Open Peer Commentary' on Schwartz 1982.

4 For some discussion of the intentional nature of speech, see, for example, Levelt 1989:30, 58ff.

5 The meanings of the other neologisms are given in note 31 below. '*the wabe*' means 'the grass-plot round a sundial' ... ('because it goes a long way before it, and a long way behind it' .... 'and a long way beyond it') [*TLG* 272].

6 Traditionally, no clear distinction has been drawn between the purposes of language behaviour and the purposes or functions of language. For relatively recent characterizations and classifications of the 'functions of language', see, for example, Crystal 1987:10ff., Halliday 1970, 1976:27-30, Halliday and Hasan 1985:10ff., Nuyts 1993, Wardhaugh 1993:190-197 and the literature reviewed in these studies. Bühler 1934, Hymes 1962, Jakobson 1960 and Ogden and Richards 1949 are considered to be 'classics' among the older writings on the 'functions of language'. In the present account, a distinction is drawn between the purposes of language behaviour and the function(s) or purpose(s) of language. For a discussion of the latter, see paras. 5.1, 5.4.2, and chap. 6.

7 For the confusion that has resulted from the (mis)use of these ambiguous terms, see, for example, Chomsky 1975:53ff., 1980:230, Nuyts 1993:226-228.

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8 For a discussion of some of the problems involved in distinguishing among these kinds of meaning, see, for example, Lyons 1977: 50ff. For a discussion of the nature of the kind of meaning conveyed by utterances used for the purpose of sensory interaction or so-called critical communication, see Isenberg 1954, Lehrer 1982, 1983.

9 For some discussion of the general nature of turn-taking, of the diversity of turn-taking cues and of the properties of turn-allocation rules, see, for example, Beattie 1983, Crystal 1987:118, Denny 1985, Duncan 1972, Duncan and Fiske 1977, Graddol et al. 1987:150-162, Levelt 1989:30-39, Levinson 1983:296ff., Sacks *et al.* 1974 and the literature surveyed or cited in these sources.

10 For an analysis of this exchange between Alice and the Caterpillar, see Hardy 1989:227-228. The general aim of Hardy 1989 is to show that pragmatics is the interpretive system that 'best contributes to an understanding of the major themes of [Carroll's] works'.

11 The Cooperative Principle and the four sets of rules --- called 'maxims' --- in terms of which this principle is realized are due to Paul Grice (1975, 1978). Grice's maxims read as follows:

The Maxim of Quality
Try to make your contribution one that is true, specifically
(i) do not say what you believe to be false
(ii) do not say that for which you lack adequate evidence

The Maxim of Quantity
(i) make your contribution as informative as is required for the current purpose of the exchange
(ii) do not make your contribution more informative than is required

The Maxim of Relation
make your contribution relevant

The Maxim of Manner
be perspicuous, and specifically:
(i) avoid obscurity
(ii) avoid ambiguity

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(iii) be brief
(iv) be orderly

For an expository discussion of these conversational maxims, see, for example, Levelt 1989:39-44, Levinson 1983:100-118.

12 For a discussion of the nature, functions and types of deixis, see, for example, Allan 1986:37-40, Levelt 1989:45-58, Levinson 1983:61ff., Lyons 1977: chap. 15, Miller and Johnson-Laird 1976:374ff.

13 For some discussion of the components and make-up of the context of nonlinguistic (or nonverbal) behaviour, see, for example, Bolinger 1980: chapter 2, Graddol *et al.* 1987:134-150, Scherer and Wallbott 1985. Poyatos (1993) discusses in detail what some linguists call 'paralinguistic components' of this context. He (1993:130) defines *paralanguage* as 'the nonverbal voice-qualities, modifiers and independent sounds and silences with which we support or contradict the simultaneous linguistic and kinesic structures'. The paralinguistic phenomena discussed by Poyatos include what he calls *primary (voice) qualities* (e.g., loudness, pitch, timbre, tempo, resonance, rhythm, etc.), *(voice) qualifiers* (e.g., those making a voice 'creaky', 'whispery', 'murmured', 'breathy', 'falsetto', 'harsh', 'shrill', 'metallic', 'husky', 'hoarse', etc.), *differentiators* (e.g., laughing, crying, shouting, yawning, panting, gasping, belching, etc.), and *alternants* (e.g., 'Aah', 'Uh-huh', 'Ooh', 'Ugh', 'Shush', 'Mmm', 'Uh-hu', 'Psst', 'Tut-tut', etc.).

14 For Chomsky's view of novelty as a property of linguistic utterances and of innovativeness (as well as unboundedness in scope) as a property of language use, see, for example, Chomsky 1959:32, 56, 1964:77ff., 1972:10-11, Botha 1992:47, 49, 99-100.

15 For Chomsky's case for the view that typical instances of language behaviour are free from stimulus-control, see, for example, Chomsky 1959:31-32, 1972a:10-11, Botha 1992:47-49.

16 For Chomsky's position on the appropriateness (and the resulting coherence) of language behaviour, see, for example, Chomsky 1972:11-12, 1987c:11.

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17 For Chomsky's notion of the 'creative aspect of language use', see, for example, Chomsky 1964:17ff., 1972:10-11, 1987c:11.

18 For Chomsky's view of rule-governedness as a property of language use, see, for example, Chomsky 1987a:64, 67, 1987b:20-24.

19 We will take up this point again in par. 3.3.1.1 below.

20 For an excellent technical account of speaking in terms of which conceptualizing, formulating, externalizing (in the form of articulating) and self-monitoring are the major 'processing components', see Levelt 1989. For a less technical discussion along similar lines, see Aitchison 1989: chapter 11. Levelt 1989, in addition, offers a detailed account of the micro-level make-up of the four major 'processing components' of speaking, surveying at the same time much of the relevant technical literature. See also Garrett 1988 for a discussion of the so-called processes in language production.

21 Lewis Carroll [*TLG* 191] interpreted the unfamiliar words in the cited stanza as follows:

brillig	:	'the time for broiling dinner'
slithy	:	'smooth and active'
toves	:	'badgers with smooth white hair, long hind legs and short horns; living chiefly on cheese'
gyre	:	'to scratch like a dog'
gimble	:	'to screw out holes in anything'
wabe	:	'the side of a hill'
mimsy	:	'unhappy'
borogoves	:	'parrots that had no wings, beaks turned up: making their nests under sundials and living on veal'
mome	:	'grave, solemn'
raths	:	'land turtles with erect heads, mouths like sharks, curved legs and smooth green bodies: living on swallows and oysters'
outgrabe	:	'squeaked' [*TLG* 191]

Humpty Dumpty [*TLG* 270-272] gave a more graphic definition of the meaning of some of these words.

22 To see what 21a-c mean, consider 21'a-c respectively:

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21'a *The cat grinned; the executioner beheaded this cat; the Queen employed this executioner ...*

b *The Queen who was hit the hedgehog hit the (same) hedgehog.*

c *The King's horses that were galloped through the rose garden stumbled.*

21a-b are for systematic reasons hard to comprehend. For these reasons, see, for example, Aitchison 1989:203-216, Bever 1970, 1974, Botha 1981:227-232.

23 There is no single study of comprehension that is comparable in scope and depth to Levelt's 1989 work on speaking. For less wide-ranging surveys of recent work on aspects of comprehension, see, however, Flores d'Arcais 1988, Garman 1990, and Singer 1990. For a less technical account, see Aitchison 1989:chap. 10. There are essentially two families of models of the nature of the relations holding among the various activities or processes involved in the comprehension of utterances. The first, as exemplified by Carroll, Tanenhaus and Bever 1978, comprises so-called serial models; on these, certain processing activities follow one another in a chain-like fashion. The second, as instantiated by Marslen-Wilson, Tyler and Seidenberg 1978, is the family of so-called parallel models; on these, certain processes interact in a parallel way with one another in comprehension. Terminological variation has contributed to the relative inaccessibility of the literature on utterance comprehension. This point is borne out by the following observation by Flores d'Arcais (1988:97): 'Depending on the area of research and on the interest of the researcher, the term 'perception' has been synonymous with *identification, recognition, discrimination, understanding*, and *comprehension*. In speech perception research, the term covers almost every sensory and perceptual operation, in psycholinguistics the term has been used to designate such diverse processes as word recognition, the segmentation of the speech signal, judgements of similarity between two linguistic structures, and even the comprehension of connected discourse.'

24 For the characterization of introspection as the conscious taking of 'mental meter readings', see Katz 1981:194ff.

25 For some discussion of the psychological processes involved in analytic thinking, see, for example, Bruner 1961, Coward 1981:171-172, Hammond 1965.

26 For an analysis of these sentences, see Zepeda 1983.

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27 For a detailed survey and appraisal of the psychological and philosophical literature dealing with the nature and properties of intuiting, see Coward 1981. See also Katz 1981:193ff. for a discussion of various theories of what intuition is.

28 According to the literature surveyed in Levelt 1989:460-463, the following aspects of spoken utterances are monitored in this way: meaning or conceptual make-up, contextual appropriateness, sufficiency of the information expressed, lexical choice, syntactic and morphological form, sound-form, and speed, loudness, precision and fluency of articulation.

29 For (alternative accounts of) the specifics of the ways in which production, comprehension and self-monitoring interact, see, for example, Levelt 1983, 1989:469ff.

30 For the distinction among various 'kinds' of translation (pragmatic vs. aesthetic vs. ethnographic/sociolinguistic vs. linguistic) and for the distinction among different 'levels' of translation (word-for-word vs. literal vs. free), see Crystal 1987:344-345. For discussions of (some of) the different accounts or 'models' of the processes involved in translation, see, for example, Holmes et al. (eds.) 1970, Holmes, Lambert and Van den Broeck (eds.) 1978, and Van den Broeck and Lefevere 1984: chap. 6.

31 The highly complex (clusters of) activities or processes involved at a micro-level in what we have portrayed as using the oral channel (in speaking), using the aural modality (in listening), using the manual channel (in writing) and using the visual modality (in reading) fall beyond our macroscopic perspective on linguistic reality. In regard to speaking, these activities/processes are discussed in detail in Levelt 1989. For a much more restricted account of work done on the micro-mechanics of listening, writing and reading, see Crystal 1987c: parts IV and V, Garman 1990: chaps. 4-7 and the literature surveyed there.

32 For some discussion of the differences between speaking and writing, see, for example, Biber 1988:47-58, 101ff., Crystal 1987:178-179, Halliday 1985:92-97, Olson 1993 and the literature surveyed there.

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33 For some discussion of functional differences between speaking and writing, see, for example, Biber 1988:42-44, Chafe 1982, 1985, Halliday 1989:39-41, 80-82.

34 For a detailed discussion of the linguistic differences between spoken and written utterances, see Biber 1988. This discussion also offers a good critical survey of other relevant literature.

35 Speaking has been taken to be basic from a structural and a functional perspective too. Structurally, the smallest units produced in speaking (namely sounds) admit of far fewer combinations than do the smallest units of writing (letters). Functionally, speaking is used for a wider range of purposes than writing is. For a discussion of the various perspectives from which speaking is considered basic, see, for example, Lyons 1981a:11-17.

36 As distinct ways of behaving, modes of speaking and of writing differ both from the so-called genres and from the so-called types of the texts produced by speaking or writing. As Biber (1988:70, 171) draws the distinction, genres characterize texts on the basis of (text-external) criteria relating to the speaker's purpose and topic, but text types represent groupings of texts that are similar in their linguistic form, irrespective of genre. For example, an academic article on Asian history belongs to the genre of academic exposition, but its text type might be narrative-like (and more similar to some types of fiction than to scientific or engineering academic articles). In short: genre and text types are to do with (texts as) products of language behaviour; modes of speaking and modes of writing, however, are to do with language behaviour itself.

37 For a discussion of various mixed types and genres of texts, see Biber 1988: chaps. 6-8. See, for example, Tannen 1982 and 1985 for a clear articulation of the idea that there is an oral/literate continuum. The more traditional idea of an oral/literate dichotomy is found in, for example, Chafe 1982 and 1985. For (the history of) the cultural dimension of the oral/literate continuum, see Edwards and Sienkewicz 1990:6-11 and the literature surveyed there.

38 Some of the protracted linguistic processes mentioned above will be examined in later chapters of this study.

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4 Its Capacities Stratum

1 The processing involved in the production and comprehension of spoken utterances is conventionally called 'speech processing'. The expression 'language processing' applies also to the processing involved in reading/writing, signing/'seeing' and (silent) mouthing/lipreading.

2 This is the view articulated by Levelt (1989:8ff.) in his comprehensive work on speaking. In this section on linguistic processing, I will be drawing heavily on Levelt's work.

3 The following diagram has been taken over from Levelt 1989:9. Levelt presents it as 'a blueprint for the speaker'.

4 For surveys of work done on components of the speech-production system, see, in addition to Levelt 1989, also Allport et al. (eds.) 1987, Garman 1990:chap. 7, Garrett 1988, Kempen (ed.) 1987, Levelt (ed.) 1993.

5 See Garman 1990:429-432 for some discussion of specific anomia and related other language pathologies.

6 For a survey of the major positions on the nature of the relationship between 'language' production and 'language' comprehension, see MacKay et al. 1987.

7 For surveys of work on components of the speech-comprehension system, see, for example, Altman (ed.) 1989, Frazier 1987, Flores d'Arcais 1988, Forster 1991, Garman 1990:chaps. 4-6, Garrett 1991, Miller 1991, Singer 1990.

8 For an account of the anatomy and physiology of the vocal tract, see, for example, Crystal 1987:124-131, Garman 1990: 94-99. For an account of the anatomy and physiology of the auditory system, see Crystal 1987:142-144, Garman 1990: 52-64.

9 For the idea that the mind is a symbolic system, see, for example, Johnson-Laird 1988:34-35. This idea has been developed into (various versions of) the representational theory of the mind, for some technical discussion of which see Haugeland (ed.) 1981. For a discussion of what is called the 'symbolic architectures of cognition', see Newell, Rosenbloom and Laird 1989. For a highly readable characterization and illustration of the concept of mental representation see Pinker 1994:73-82.

10 For some discussion of central claims of the computer model of the mind and of some of its limitations, see, for example, Colby 1978, Gardner 1985:40-41, 118-130, Johnson-Laird 1988: chaps. 2 and 3, Marshall 1980:106-107, Moor 1978. For more recent discussion of the computer model of the mind, see Block 1991, Chomsky 1993:42-44, Dennett 1991:435ff. and Edelman 1992:218ff. On the computational nature of mental processes, see further the references in note

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20 below. On the view that the mind represents the functional aspect of the brain, see, for example, Chomsky 1987a:1-6, Botha 1992:94-97. On the general distinction between the mental and the material/physical, see Chomsky 1987a:5, 1989:5, 1993:35ff., Salkie 1990:80 and also par. 5.5 below.

11 For a discussion of the functional specialization and domain specificity of various of the processes involved in

(a) (speech) production, see, for example, Levelt 1989:14-15, Marshall 1984:234-236;

(b) (speech) comprehension, see, for example, Darwin 1991, Fodor 1983:47-52, Liberman 1991, Mann and Liberman 1983, Marshall 1984:218-219, Mattingly and Liberman 1985.

In addition, various contributions to Allport et al. (eds.) 1987 --- e.g., Funnell and Allport 1987, Gordon and Meyer 1987, Keele 1987, MacKay 1987 and Monsell 1987 --- flesh out the view that much of the processing involved in the production and perception of utterances is done by 'functionally separable subsystems'.

12 For a discussion of the autonomy of some of the processes involved in the production of utterances, see Levelt 1989:14-16. Autonomy is attributed by Fodor (1985: 1) to processes involved in the comprehension of utterances too. The idea of informational encapsulation is discussed in some detail in Fodor 1983:64-86.

13 See Levelt 1989:20-21 for an illuminating discussion of the automaticity of various processes involved in speaking and also for more of the specifics of the non-automatic nature of conceptualizing and monitoring.

14 See Fodor 1983:52-55 for a discussion of mandatoriness as a property of some of the processes involved in the comprehension of utterances.

15 For some discussion of the idea that parsing is a dumb process, see, for example, J.D. Fodor 1985:8, Frazier 1978 and Frazier and J.D. Fodor 1978. For a clarification of the distinction 'dumb vs smart' see J.A. Fodor 1985:1-2. (Elsewhere, I refer to J.A. Fodor simply as 'Fodor'.)

16 The quotation given above is from Fodor 1983:64. See also Fodor 1983:61-64 for specifics of the fastness of the processes involved in speech comprehension, and Levelt 1989:22 for some observations on the fastness of processes involved in speech production.

17 This rough account of the incremental processing of *The Cat sat on a branch for a while* is fashioned after Levelt's (1989:25-26) account of the processing of the utterance *John played in Amsterdam last week*. The figure used above for giving a (very) rough graphic representation of the incremental nature of the processing

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of *The cat sat on a branch for a while* is based on a similar figure found in Levelt 1989:25. The latter figure is after Kempen and Hoenkamp 1987. For a discussion of what incremental processing in general involves, see, for example, Garman 1990:173-175 and Levelt 1989:24-27.

18 From overviews such as Garman's (1990:320ff.), it is clear that the comprehension of utterances also involves both serial and parallel processing. Whereas some psycholinguists (e.g., Carroll, Tanenhaus and Bever (1978)) have developed what are known as 'serial models of speech comprehension', others (e.g. Marslen-Wilson, Tyler and Seidenberg (1978)) have developed what they call 'parallel models'.

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19 For the conception of modularity presented above, see Fodor 1983, 1985. For (critical) discussion of Fodor's conception of modularity, see, for example, Arbib 1989, Cain 1989, Chandler 1993, Dennett 1984, Gardner 1985, 1985:133ff., Jackendoff 1987:260ff., Marshall 1984, Putnam 1984, Ross 1990, Shallice 1984, and the Open Peer Commentary in *The Behavioural and Brain Sciences*, Vol. 8 (1985:6-33). See also Fodor 1985 for a reply to this commentary. For a variety of contributions to a workshop called 'Modularity in knowledge representation and natural-language understanding', see Garfield (ed.) 1987.

20 For the assumption that much of the processing involved in speech processing is computational, see Fodor 1983, 1985. For a similar view of speech production see Levelt 1989:67. For a nontechnical account of the view that the mind is a symbolic system, see, for example, Johnson-Laird 1988:chap. 2. A more technical account of this view - including the idea of computationality - may be found in, for example, Pylyshyn 1984, 1989. For the technical idea that a mental computation has to respect certain semantic conditions, see Fodor 1983:5.

21 As will become clear in par. 4.2, the two speech-processing systems crucially interact with linguistic capacities as well.

22 For an explication of the distinction between knowledge of language and the ability to use language, see, for example, Chomsky 1980a:51-52, 1986:9, Botha 1989:47-49, Taylor 1988:148-153.

23 For Chomsky's distinction between competence and performance, see, for example, Chomsky 1965:4, 1980a:203-205, 225, Botha 1989:91-94. For some criticisms of this distinction and also some rebuttals of these criticisms, see, for example, Newmeyer 1983:35 ff., Taylor 1988:154ff.

24 For some discussion of the distinction between conscious knowledge and unconscious, tacit or implicit knowledge, and for a characterization of the

nature of unconscious knowledge, see, for example, Chomsky 1980a:69ff., 241ff., 1986:270ff, 1993:21ff, Botha 1989:55-57.

25 For some discussion of the idea that knowledge of language is not justified or grounded knowledge, see Chomsky 1980a:93-95, 1980b:57, Botha 1989:58-61, Stich 1980:39.

26 As we proceed, it will become clear that this view of the componential make-up of knowledge of language is due to Noam Chomsky.

27 For further illustration of the lexical and combinatorial aspects of grammatical competence, see Pinker 1994:83ff.

28 This view --- which is credited to Wilhelm von Humboldt --- has been given a modern articulation by Noam Chomsky (1987a:16-17, 1987b:7, 1987c:13, 1988b:4-5). For some further discussion, see Botha 1992:109-111 and Pinker 1994:84.

29 For some discussion of the nature of grammatical competence, see Chomsky 1980a:54-59, 224-225, 1982:19-21, Botha 1989:74-76. For the species-specific nature of grammatical competence, see, for example, Chomsky 1980b:57-58, 1982:19-21, Botha 1989:74-76. For the distinction between grammatical competence and the symbolic systems taught to apes, see Chomsky 1980a:239-240, 1983:315-316 and Botha 1989:79-81. For an instructive discussion of work that reveals the inability of higher apes to acquire human language, see Pinker 1994:334-342.

30 For a discussion of the nature and properties of the various kinds of speech acts, see, for example, Levinson 1983:226ff., Mey 1993:109ff., Schiffrin 1994:49ff., Searle 1969, 1979.

31 For a discussion of the maxims governing the cooperative use of language, see, for example, Grice 1975, 1978, Levinson 1983:100-118, Mey 1983:65ff. Some examples of these maxims have been considered in par. 3.2.2 above.

32 For a discussion of this linguistic episode, see Hardy 1989:229.

33 For some discussion of the phenomenon of 'meaning more than what is said' - technically called 'the phenomenon of implicature' - see for example Levinson 1983:97ff., Mey 1993:99ff.

34 Some of these aspects of conversation 'management' are illustrated in par. 3.2.2 above.

35 For some discussion of this example, see Hardy 1989:227.

36 For the sincerity condition, see, for example, Levinson 1983:51, 103-105, Mey 1993:120-123, Searle 1969:57ff.

37 For a general characterization of the nature of pragmatic competence, see Chomsky 1980a:59, 224-225, Botha 1989:74-75. For an interesting attempt to

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give a provisional characterization of the make-up of pragmatic competence, see Kasher 1991:136-141.

38 For some discussion of Lewis Carroll's amusing use of the concept of the 'null class', see Holmes 1971:161-162.

39 For a discussion of the nature and properties of thematic roles (or relations) see, for example, Frawley 1992:197-248, Jackendoff 1972:chap. 2.

40 For a concise account of central properties of the symbolic behaviour of individual higher apes, see Aitchison 1989:37-38, Pinker 1994:335-342. For Chomsky's views on the conceptual capacities of higher apes, see Chomsky 1980a:57-58, 1982:19-21.

41 For Chomsky's view that knowledge of language is a structured mental state, see, for example, Chomsky 1980a:49-50.

42 For some elaboration of the point that perceptual complexity may trigger unacceptability judgements see, for example, Aitchison 1989:203-216, Bever 1970, 1974, Botha 1981:227-232 and par. 3.3.1.2 above.

43 For some discussion of the diversity of the sources of (un)acceptability judgements, see the references in note 42 above. On the distinction between grammaticality and acceptability, see Chomsky 1965:10-11, Botha 1989:185-186.

44 For Chomsky's characterization of the language faculty and of its initial state (which embodies the language acquisition capacity, also called the 'language acquisition device' or 'universal grammar'), see, for example, Chomsky 1980a:65, 187, 1981a:34-35, 1983:109, 1986:25-26, Botha 1989:16-17, 25ff.

45 For some specifics of how stimulus deprivation affects the language acquisition of children, see, for example, Curtiss 1990, Newport 1990. For an introductory discussion of the phenomenon under consideration, see Pinker 1994:290-296.

46 For Chomsky's characterization of the degeneracy of the stimulus, see Chomsky 1980b:42, Botha 1989:19.

47 For Chomsky's characterization and illustration of structure-(in)dependence, see, for example, Chomsky 1975a:57ff., 1983:315-320, Piattelli-Palmarini 1994:327-328. For a less technical account of this characteristic of language, see, for example, Aitchison 1989:29-30, Pinker 1994:40-43.

48 For Chomsky's views on the poverty of the stimulus, see, for example, Chomsky 1980a:34-36, 1980b:42, 1986:xxv, 6-7, 1993:24ff, Botha 1989:13, 19-20, 181-182.

49 For the examples discussed above, see Chomsky 1986:8, 1993:24.

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50 For some discussion of the nature and (problematic) properties of innate knowledge, see Chomsky 1980a:96, 1980b:51, Botha 1989:61-62, Edgley 1970:28ff.

51 For Chomsky's views on the genetic basis of innate knowledge of language, see Chomsky 1980a:31ff., 65ff., 241, 245, 1983:73, 12-125, 179, 1986:xxv-xxvi, Botha 1989:16, 25-35. For a broader perspective on the genetic basis of (knowledge of) language, see Pinker 1994:chap. 10.

52 The Diamonds are the dream world counterparts of a real British family afflicted by SLI. The utterances 5 - 9 are modelled on utterances actually produced by members of this family. For an account of the nature of the genetically based language affliction of this family, see Gopnik and Crago 1991, Pinker 1994:48-50, 323-325.

53 For Chomsky's view of linguistic universals, see, for example, Chomsky 1980a:28-29, 1983:263, 1986:23, Botha 1989:130-135.

54 Chatterbox is a clone of a real world linguistic idiot savant called 'Crystal' whose linguistic and other capacities are discussed in Bellugi et al. 1991, 1992 and Pinker 1994:52-53. Persons such as Crystal have a form of retardation called 'Williams syndrome'. As children, they are short and slight, have elfin-like faces, have an IQ of about 50, cannot learn to perform simple ordinary tasks but are fluent conversationalists and able to understand complex sentences. The story attributed here to Chatterbox was in fact told by Crystal at the age of eighteen.

55 For the language-specifity of the language acquisition capacity, see, for example, Chomsky 1980a:47, 245, 1983:110, 320ff., 1986:4, Botha 1989:29-31, 109-113. There is a second syndrome, Turner's syndrome, where there is deficient cognitive development but normal linguistic development, as noted by Jackendoff (1994:116).

56 The account given above of the language-specificity of the linguistic principle 13 is based on Piattelli-Palmarini 1994:328-330, which offers a fuller discussion of the case and also some references to recent literature dealing with it.

57 For Chomsky's views of the modularity of the initial state of the language faculty and of the language-specificity of its constitutive principles, see Chomsky 1981b:5, 1983:113-117, Botha 1989:111. For arguments to the effect that basic characteristics of the language faculty are 'mirrored in' other human mental capacities - such as a '(universal) musical grammar' and a 'visual grammar' - see Jackendoff 1994:chap. 13.

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58 This illustrative description of 'general themes' and 'specific variations' as characteristics of the Alice stories by Lewis Carroll and Gilbert Adair is based on studies such as Hardy 1989, Holmes 1971, Spacks 1971.

59 For the view that the initial state of the language faculty incorporates a set of principles with open parameter values, the view that a grammar is a set of fixed parameters, and the associated view that language acquisition comes down to parameter fixing, see Chomsky 1986:146, 150-151, 243. The illustration given above of the nature of principles and parameters is based on Pinker's (1994:106-112) informal account of Chomsky's principles-and-parameters conception of language.

60 For reading and writing as nonbasic means of language behaviour, see par. 3.3.2 above and for some of the various modes of speaking, listening, reading and writing, see par. 3.3.3 above.

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5 Its Codelike Core

1 In note 5 appended to the text, readers are told that 'Mock turtle soup is an imitation of green turtle soup, usually made from veal. This explains why Tenniel [the original illustrator of the Alice stories] drew his Mock Turtle with the head, hind, hoofs and tail of a calf.' [*AIW* 124]

2 See par. 4.1.1.1 above.

3 The phonological structure of the third box corresponds to what is indicated as the 'phonetic plan' in Figure 1 in par. 4.1.1.1 above.

4 See par. 4.1.1.2 above.

5 This also applies to written and signed language, two secondary means of behaving linguistically. For some discussion of the relation between speaking and writing, see par. 3.3.2 above. And for some observations on the relation(s) between spoken utterances, written utterances and signed utterances, see par. 2.1.1.

6 For recent functional characterizations of language as a means of *converting* 'messages' or conceptual structures *into* utterances and vice versa, as a means of *mapping* 'messages' or conceptual structures *on to* utterances and vice versa, as a means of *translating* 'messages' or conceptual structures *into* utterances and vice versa, or as a means of *mediating between* 'messages' or conceptual structures and utterances, see, for example, Jackendoff 1990:737, 1994:39-43. The processual concepts used in such characterizations --- 'converting', 'mapping', 'translating' and 'mediating' --- can be technically distinguished from one another. Our account of the function of language involves nothing, however, that hinges on such technical distinctions. As noted by Chomsky (1994c:49), this kind of functional characterization of language is anticipated in the traditional conception of a language as 'a way to speak and understand'. Some linguists have tried to capture the nature of language by portraying it metaphorically as a (conversion) 'code'. For instances of this portrayal, see, for example, Jackendoff 1990:737, Lyons 1981:17-24 and, more recently, Pinker 1994:87ff.

7 For the former characterizations by Chomsky, see Chomsky 1988b:5, 1994c:49. For the Humboldtian roots of these characterizations, see Chomsky 1988b:4. For further discussion of the generative nature of language, see also Bloom 1994, Corballis 1994. In par. 5.2.5 below we will return to the idea of the infinity of language.

8 For some of the reasons for introducing two levels of syntactic structure, see par. 5.3.4 below. Chomskyan linguists have argued that, in order for linguistic

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theories to achieve explanatory adequacy, the formal power or richness has to be restricted. On the specifics of this view, see Chomsky 1986:51, 52-53, Botha 1989:169-170.

9 For some discussion of the productivity of language, see Lyons 1981a:22-23, 230-231. The conception of productivity expounded by Lyons is narrower than the one that we have considered above. On the use of the notion of 'effability' in this context, see, for example, Akmajian et al. 1990:7, Katz 1981:225-226.

10 For a discussion of the arbitrary nature of the relation between the form and meaning of words, see Lyons 1977:70-71, 101-105, 1981a:19-20, Saussure 1983:67-69. Saussure took a linguistic sign to be a unit with two 'opposite sides' --- a signifying side or sound image and a signified side or concept--- linked by a relation of arbitrariness. For the distinction between symbols and icons, see Lyons 1977:99-105, Peirce 1933, Part II:249. Denoting a particular kind of relation between the forms and the meanings of words, the term *arbitrariness* is used in a narrow sense. As noted by Lyons (1977:70-71), the term is used in a wider sense as well to 'describe any feature of [language] that cannot be said to derive from the properties of the channel along which language is normally transmitted, from the physiological and psychological mechanisms employed in the production or reception of language or from the functions language is called upon to perform'.

11 For some discussion of the 'advantages' and 'disadvantages' of 'the principle of the arbitrariness of the linguistic sign', see, for example, Lyons 1981a:19-20, Pinker 1994:83-84, Pinker and Bloom 1990:718, Traugott and Pratt 1980:4-5.

12 Rules 1-3 were introduced in paras. 4.2.2.1, 4.4 and 4.3.1 respectively.

13 For the linguistic universals 4-6, see paras. 4.3.1, 4.3.3 and 4.3.4 respectively.

14 For this point, see par. 4.2.1.3.

15 For the principles-and-parameters conception of what language is, see, for example, Chomsky 1981a, 1986:46, 150-151, 243, 1992:5-6, Botha 1989:88-90. The illustration given above of the nature of principles and parameters is based on Pinker 1994:106-112. More recently, Chomsky (1992, 1994a, 1994c:51,) has argued that even such principles may themselves be epiphenomena. The gist of Chomsky's argument is that the consequences of these principles can be reduced to what he (1994c:51) calls 'more general and abstract properties of the computational system, properties that have a kind of "least effort" flavor'. These properties characterize what Chomsky (1992:2, 1994b:388) also refers to as 'principles of economy' or 'economy conditions'. The reduction of the kind of principles provided for in the principles-and-parameters conception of language to the latter, deeper, principles of economy

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forms a core component of the 'minimalist program' for linguistic theory which is outlined in, for example, Chomsky 1992, 1994a. Marantz 1994 offers 'A Reader's Guide to "The Minimalist Program for Linguistic Theory"' (i.e., to Chomsky 1992).

16 The outline given above of the distinction between discrete combinatorial systems and blending systems is based on Pinker's (1994:84-85) lucid account. Pinker (1994:85) offers one further example of a discrete combinatorial system: 'the genetic code in DNA, where four kinds of nucleotides are combined into sixty-four kinds of codons, and the codons can be strung into an unlimited number of different genes'. And he (1994:85) cites 'geology, paint mixing, cooking, sound, light and weather' as other examples of blending systems (which predominate among the complicated systems in the world). For further discussion of discreteness as a property of (some of the) units used by (human) language, see, for example, Lyons 1977:78-79, 1981a:21-22, Martinet 1964:31-33. On how animal communication systems compare with (human) language in regard to discreteness, see, for example, Chomsky 1966:77-78, Hockett 1960, McNeill 1970:chapter 4. McNeill uses the expression 'combining system' to denote (human) language as a discrete combinatorial system; he uses the expression 'graded system' to denote non-discrete animal communication systems. For a useful survey both of work on fundamental properties of various animal communication systems and of various comparisons of animal communication systems with (human) language, see Akmajian et al. 1979:chapters 2-5.

17 For some discussion of duality as a basic property of language and of the way in which duality interacts with such other properties as discreteness and arbitrariness see, for example, Lyons 1977:71-76, 1981a:20-21, Martinet 1964:22-24, Pinker 1994:162-163.

18 For further discussion of how recursiveness has, over the years, been seen and accounted for in generative grammar, see Bach 1974:194-196, Chomsky 1957:23-24, 1965:37, Culicover 1976:27, 178-183, Jackendoff 1994:74-75.

19 For the characterization of a language as an infinite set of sentences, see Chomsky 1957:13. The status of this characterization in Chomsky's evolving thinking about language is considered in, amongst others, Botha 1989:72-73, Steinberg 1975:220-221.

20 For Chomsky's views on how (human) language differs in regard to discrete infinity from animal communication systems, see Chomsky 1980a:38-39, 1987a:16-17, 1987b:7, 1987c:13. As far as Chomsky (1987a:16-17) knows, there is only one other 'behavioral phenomenon' that shares properties of

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discrete infinity exhibited by language and that involves similar principles of digital computation: the human number faculty. In his (1980a:38) view, the very essence of the number system is the concept of adding one, indefinitely. Chomsky (1987a:16-17) also considers another finding quite surprising: the finding that the language faculty, as a part of the mind, is in crucial respects a system of digital computation of a highly restricted character.

21 The following illustration of the structure-dependent nature of grammatical rules is based on Chomsky's lucid (1988a:41-46) account of the principle of structure-dependency with reference to the rule for forming *yes/no* questions in Spanish. For reference to other discussions of this principle, see also note 48 to chapter 4 above.

22 Within the framework of Chomsky's principles-and-parameters conception of language or that of his more recent 'minimalist program', structure-dependency would reflect a property or a cluster of properties of the deeper (i.e., non-epiphenomenal) entities from which grammatical rules such as the *yes/no* question rule can be derived.

23 For useful introductory discussions of the nature of phrase structure, see, for example, Jackendoff 1994:70ff, Pinker 1994:97ff. Pinker offers a clear account of the reasons for assuming that 'sentences are trees', as he puts it. For a more detailed introduction to the properties of phrase structure, see, for example, Haegeman 1991:chapter 2, Van Riemsdijk and Williams 1986:chapter 3.

24 For these remarks, see Pinker 1994:99-100.

25 For fuller discussions of structural discontinuity as a basic property of sentences, see, for example, Akmajian et al. 1990:157-162, Chomsky 1994b:389, Pinker 1994:89ff.

26 How the interpretation of echo questions helps linguists to understand that of *wh*-questions is lucidly explained in Jackendoff 1994:76. As Jackendoff (1994:77) shows, 'quizz-show' questions --- such as 'Mr Van Doren, for $64,000: on the morning of July 4, 1776, General Washington ate *what* for breakfast?' --- are similarly helpful to linguists for coming to grips with the way in which *wh*-questions are understood.

27 For a recent (re)statement of this view, see Chomsky 1994b:389.

28 The *wh*-questions 37a-f correspond to the declarative sentences i-vi respectively. In the questions, *t* marks the position in which the italicized phrases occur in these declarative sentences.

(i) The Knight believed that the King thought that the Hatter told the March Hare that the Queen would order the Executioner to behead *the cook* on the croquet-ground.

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(ii) The Executioner wore a top hat and *a bow tie* for carrying out his duties.

(iii) The croquet game was played on the day that *the White Queen* fired the intellectual Executioner.

(iv) For the Executioner to get *a pay rise* is easy.

(v) The Queen hired a new Executioner who uses *a hi-tec axe*.

(vi) Alice wondered who would get *the job of deputy Executioner*.

29 For a non-technical, introductory, account of the nature of long-distance dependencies, the various kinds of sentences (not *wh*-questions alone) that incorporate them and the source of the constraints on such dependencies, see Jackendoff 1994:75-80. For a fuller account of the various constraints on such dependencies see, for example, Van Riemsdijk and Williams 1986:chapters 2 and 5 and also the literature cited there. For a more recent, fairly technical account of these constraints, see Haegeman 1991:364-373. On the 'super-rules' or universal constraints which rule out the *wh*-questions 37b-f, see Van Riemsdijk and Williams 1986:20-23.

30 See Chomsky 1994b:389 for the essence of the proposal that the relation of a moved phrase to the position of its interpretation is that of a transformation.

31 For a first introductory account of the distinction between deep structure and surface structure and of the nature of syntactic transformations, see Akmajian et al. 1990:162-165, Jackendoff 1994:75-77, and Pinker 1994:120-124. For a more detailed introductory account of the nature and function of syntactic transformations, see Haegeman 1991:271-282. For Chomsky's most recent 'minimalist' view of the status of the distinction between deep and surface structure, see Chomsky 1992, Marantz 1994.

32 For the view that traces are unpronounced pronouns, see Jackendoff 1994:77. On the idea that traces serve as 'reminders' of the role that a moved phrase is playing, see Pinker 1994:122.

33 For this argument see Chomsky 1992:27ff. What is at stake is the existence of 'D-structure' and 'S-structure', which are highly 'technical' versions of the original constructs of 'deep' and 'surface structure', respectively. On the relevant controversy between followers and opponents of Chomsky, see, for example, Newmeyer 1980:chapter 5.

34 See Abler (1989) for the view that hierarchicality characterizes, in addition to human language, several other 'naturally-occurring systems', including 'chemical interaction' and 'biological inheritance'. For an introductory discussion of the way in which words are structured phonologically, see Pinker 1994:173-175. For a more technical account, see Carr 1993:chapter 9. The phonological structures of the words in a sentence form but one aspect of the

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phonological structure that the sentence has as a whole. For an account of some of the other aspects, see Carr 1993, Clark and Yallop 1990:chapter 10, Goldsmith 1990, Kenstowicz 1994, Pinker 1994:chapter 6.

35 For the Korean example, see Jackendoff 1994:76. For an attempt to provide some kind of motivation for the direction of *wh*-movement, see Haiman 1985:238-239.

36 The general idea that grammatical form is independent of meaning, function or use has been defended by Noam Chomsky in the form of his thesis of the autonomy of formal grammar. For some of the versions of this thesis, see Chomsky 1975. For a discussion of (problems with) various views holding that grammatical form is not autonomous in Chomsky's sense, see Newmeyer 1983:chapter 4, 1990, 1991. For some discussion of the ways in which various parts of language are 'tailored to mapping a characteristic kind of semantic or pragmatic function onto a characteristic kind of symbol sequence', see Pinker and Bloom 1990:713-714.

37 For a general characterization of iconicity, see Lyons 1977:102-105. For some discussion of reduplication and repetition, see, for example, Botha 1988, Moravscik 1978 and Persson 1974. (The Tzeltal, Mandarin and Thai reduplications are from Moravscik 1978.) For some discussion both of the various kinds of iconicity found in natural language and of what are claimed to be functionally motivated aspects of linguistic form, see, for example, Haiman 1985, 1994, Haiman (ed.) 1985.

38 See Chomsky 1994c:51-52 for the above views on the usability of language. For a discussion of the problems which the interpretation of sentences 43a-d posed for Alice, see Holmes 1971:164-165.

39 For an account of Chomsky's thinking on the substance (or what he calls 'nature') of language, see Botha 1992:chapter 3. On various reactions to Chomsky's ideas and on his appraisal of these reactions, see Botha 1992:chapter 3.

40 For the ideas of Chomsky's considered above, see Chomsky 1986:22-26, 1987a:17, 1988a:36, 1988b:21 and Botha 1992:90-93.

41 For the view that languages are abstract Platonic entities, see Botha 1992:149-168, Katz 1981, Katz and Postal 1991. For problems with this view, see Chomsky 1986:19-27, Botha 1992:168-182.

42 For a non-Platonic position on which languages are abstract objects, see Popper 1977:38-49, Carr 1990:37ff., Botha 1992:183-198. Various linguists and philosophers have proposed that languages are neither material nor mental nor

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abstract objects but, instead, are 'social' objects. For a survey and an appraisal of these proposals, see Botha 1992:chapter 5.

43 See Chomsky 1987a:5.

44 For Chomsky's recent views on the relation between the mind (the mental) and the body (the material), see Chomsky 1987a:1-6, 1989:5, Botha 1992:94-97, 143-144, Salkie 1990:80. Views essentially similar to Chomsky's have been put forward by Fodor. For some discussion of these views of Fodor's, see Rey 1991:xii.

45 In Chomsky's (1992:4-5) view, the range of permissible variation among languages is restricted. He assumes, in the context of his 'minimalist program', that variation must be determined by what is 'visible' to the child acquiring language, that is, by what is known as the 'primary linguistic data'. And given this assumption, he does not consider it surprising that a degree of variation is found in the 'phonetic form component' and the lexicon. For a completely different kind of perspective on linguistic diversity, a Whorfian one, see Mühlhäusler 1993.

46 See Lyons 1991:206.

47 See Lyons 1991:209.

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6 Its Baffling Birth

1 The top hat analogy has been modelled on the spandrel analogy of Gould and Lewontin (1979).

2 For these considerations, see par. 4.2 above and also Pinker and Bloom 1990:70.

3 For a more detailed and technical account of the view that language is the product of Darwinian natural selection, see Pinker and Bloom 1990.

4 For some discussion of the major problems casting doubt on the view that language has been designed by natural selection, see, for example, Frazier 1990, Hornstein 1990, Lewontin 1990, Pesetsky and Block 1990, Piattelli-Palmarini 1989, 1990. For expert defence of the selectionist position, see Lindblom 1990, Pinker and Bloom 1990, Tooby and Cosmides 1990.

5 For these views, see Chomsky 1983:321.

6 Chomsky's views on the role of natural selection in the genesis of the language faculty are not, however, equally clear in all respects. And these views have been interpreted in conflicting ways by scholars such as Pinker and Bloom (1990), Jackendoff (1990) and Otero (1990). Chomsky has in passing presented his views in various writings, including Chomsky 1972:97-98, 1980a:99-100, 1983:321, 1988a:167, 1988b:22.

7 For these and other criticisms of the nonselectionist position on the genesis of the language faculty, see Dennett 1995:384-393, Pinker and Bloom 1990:709-711, 720-721, Tooby and Cosmides 1990. Regrettably, Chomsky has not participated directly in the BBS discussion of the selectionist position. Nor has he responded yet to the above-mentioned criticisms of the nonselectionist position.

8 The debate about the genesis of language resembles the fight between the Lion and the Unicorn in more than one way. As you may recall, these two splendid Looking Glass beasts fought a protracted battle for something of great value, the King's crown. Likewise, the proponents of the Top Hat Position (the 'Hatters') and the defenders of the Hare's Ear Position (the 'Hares') have been doing

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battle over one of the most sought-after of scholarly prizes: an intellectually respectable solution to the problem of how language developed in the human species.

In both contests, moreover, some combatants behave in a way that makes it quite difficult for onlookers to see exactly what is going on and who is getting on top of whom. As an eye-witness to the Looking Glass fight, Alice cannot even make out which of the combatants is the Lion and which the Unicorn, since 'they [are] in such a cloud of dust' [*TLG* 283]. So she is forced to rely on a Messenger's account of the action:

> 'They're getting on very well ... each of them has been down about eighty-seven times.' [*TLG* 284]

The Hare-Hatter battle too is at times covered by a cloud. Here the cloud is curiously compounded, though. In part it is dust, whipped up by great gusts of rhetoric. In part it is herrings, red ones of the kind that get drawn about. And in part it is bees, of the species given to buzzing in bonnets. This cloud in short is one that makes it trebly troublesome to detect what real progress, if any, is being achieved in this ding-dong contest.

Adjudicating two contests of this genre is not made any easier by the way in which major participants seem genuinely convinced that they have well and truly sized up their opponents:

> '"I should win easy", said the Lion.
> "I'm not so sure of that", said the Unicorn.
> "Why, I beat you all around the town, you chicken!" the Lion replied angrily, half getting up as he spoke.' [*TLG* 289]

Few, when they have taken a serious knock, appear willing to concede as much: the Lion seemingly does not even notice that the Unicorn has run it through with its horn. The debate between the Hatters and the Hares clearly lacks the kind of agreement on criteria for evidence and on standards of argument that would leave a participant no option but to concede this or that important point.

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Both contests are stop-start affairs, moreover: the participants omit to press home the advantage that they might have gained. The Lion and the Unicorn are only too happy, for instance, to take the time-out announced by the King:

> '"Ten minutes allowed for refreshments!"' [*TLG* 285]

Likewise quite a number of Hatters and Hares, after arguing amongst themselves at close quarters for a while in a structured and 'refereed' setting, seem to have disengaged, willing to give troublesome questions a rest for the time being. Unfortunately that hardly helps towards dealing with these questions in a focused and progressive way.

The debate between the selectionist Hares and the nonselectionist Hatters just referred to --- structured and refereed --- was of course conducted in *Behavioral and Brain Sciences* (1990) 13:707-784, (1994) 17:180-185. So far, however, as we mentioned in note 6 above, the debate has not been directly joined in by Noam Chomsky. This makes it a bit as if the Unicorn was fighting the Lion's shadow. For an analysis of this inconclusive debate, see Botha to appear.

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