KANZI'S PRIMAL LANGUAGE

The Cultural Initiation of Primates into Language

Pär Segerdahl, William Fields and Sue Savage-Rumbaugh

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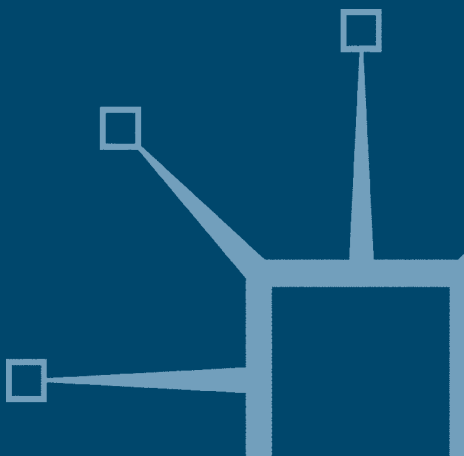

Kanzi's Primal Language

Also by Pär Segerdahl

LANGUAGE USE: Philosophical Investigation into the Basic Notions of Pragmatics

Also by Sue Savage-Rumbaugh

APE LANGUAGE

KANZI: An Ape at the Brink of the Human Mind

APES, LANGUAGE AND THE HUMAN MIND
(*with Stuart Shanker and Talbot Taylor*)

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Dedicated to the memory of Kinji Imanishi and Jun'ichiro Itani, founders of Japanese primatology and the notion of animal cultures

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Pär Segerdahl
William Fields
Sue Savage-Rumbaugh

1
Kanzi Acquires Language in a Forest in Georgia

'If any animals do learn to speak, they will not learn it just as they learn tricks.'

Rush Rhees

Culture in animals

This book develops an idea originating in Japanese primatology and currently increasingly prominent in Western biology: the idea of culture in animals. Culture is often considered what distinguishes humans from animals. While we regard humans as living meaningfully in shared cultures developed and maintained in collaboration, animals are often conceived of as moving instinctively and alone in barren nature, according to innate genetic programs, even when they live in social groups. For instance, in an ambitious attempt to explore how human consciousness evolved, Merlin Donald writes that 'our exceptional powers as a species derive from the curious fact that we have broken out of one of the most critical limitations of traditional nervous systems – their loneliness, or solipsism' (Donald 2001: xiii). Although the author's exposition of culture as a powerful dimension of human life is similar to the notion of culture developed in this book, we do not see culture as a uniquely human possession. Contemporary biologists studying animal behaviour are slowly transforming this black-and-white picture of what it is like to be an animal, as opposed to a human being. Researchers follow in the footsteps of Japanese primatologists by naming the individual animals under study and employing methods that probably would have created a scandal in Western science half a century ago. They use methods similar to those of ethnography for collecting data about how dolphins, killer whales, elephants, lions, hyenas, baboons, gorillas and

chimpanzees live together in close and organized social groups. Animal habits, games, the use of tools, and forms of cooperation are charted; individual animal personalities are portrayed; finally, the study of how animals learn from each other and how ways of life are transmitted culturally is performed.[1] This new research develops Charles Darwin's revolution in biology further by exploring the extent to which culture is one of our 'natural' possessions – one that humans share with many other animal species. We might begin to learn more about ourselves as cultural beings by studying the animals:

> Our kinship to the dolphin and the chimpanzee cannot be discarded and this is a kinship not only with respect to the animality of the body, but also with respect to forms of life. The greatest students of animal behavior have exercised skills and sensibilities that resemble closely those of the gifted social or cultural anthropologist. (MacIntyre 1999: 58)

This book explores language as an aspect of culture by examining how culture affects the acquisition of language in great apes. At the Language Research Center (LRC) in Atlanta, Sue Savage-Rumbaugh has for more than two decades studied language in pygmy chimpanzees, today known as a separate species called bonobo (*Pan paniscus*). Her achievements with the bonobo Kanzi are well-known, but the significance of her *way* of stimulating language in apes (what it teaches us about the dimensions of language, the status of science, and ourselves as cultural beings) still needs further clarification. William Fields is a research associate and associate programme director at the LRC. A member of the LRC staff since 1998, he emphasizes the importance of an anthropological understanding of the unique ape/human culture that Savage-Rumbaugh made possible at the LRC, resulting in the emergence of Kanzi's language. Together with a team of researchers in various fields, they explore how particular abilities (e.g., stone tool manufacturing) emerge in nonhuman primates when the global conditions of the culture in which the apes mature are the right ones. After 2005, their work will be continued in Des Moines, Iowa, the site of the new Great Ape Trust of Iowa (GATI), founded by Ted Townsend and specially designed to promote the form of research that we describe in this book. The research is interdisciplinary, and this monograph is the result of collaboration with Pär Segerdahl, a philosopher of language at the Centre for Bioethics at Karolinska Institutet and Uppsala University in Sweden. He joined the research team in 2001, and emphasizes the vast

difference between first- and second-language acquisition. For example, beginning to speak as a child transforms the child more profoundly than learning to speak a new language transforms a person who already speaks. In this book, his distinction between first- and second-language acquisition associates itself with Fields and Savage-Rumbaugh's emphasis on culture. Together we explore culture as the central concept for understanding ape language research, and we suggest a new understanding of the human 'primal' language in its cultural dimensions: the linguistic activities that we develop in childhood and do not have to learn again when we study foreign languages.

The book describes the history of the LRC research in the first person plural. This first-person perspective occasionally includes everyone who has worked at the LRC with sensitivity to its unique culture; most notably Savage-Rumbaugh's sister and colleague, Elizabeth Pugh, who has played an essential role in the research since the start. People and apes have come and gone, but the ape/human primate culture prospers. What this book describes is, to a great extent, this culture, and we believe readers will see aspects of themselves in it as well.

A unique feature of our research, then, is the shared culture between researchers and subjects, the bonobos Kanzi, Panbanisha, Nyota and Nathan. As this shared culture is not simply human, or bonobo, we call it the Pan/Homo culture. It developed spontaneously as we tried to live together during the past two decades, and it contains both bonobo and human traits. The culture furthermore houses a group of four bonobos who are less oriented toward the human side of the Pan/Homo culture. The matriarch of the entire group is Matata. Born in the Congo, she introduced features of bonobo culture that probably have disappeared among many captive bonobos. She raised eight bonobos of her own, and two of them, Elikya and Maisha, still live together with Matata and their father P-Suke. The entire group, then, consists of eight bonobos. Four of them are raised among humans but have daily contact with other bonobos (above all with Matata). They are therefore on the Homo-side of what we conceive of as a Pan/Homo continuum. The other four apes are more bonobo-oriented and live on the Pan-side of the continuum. (See Appendix 1 for a short presentation of the apes.)

The seemingly unimportant fact that we did not develop the Pan/Homo culture by design will be a recurrent theme of this book. Spontaneity is expounded as a central mark of culture and language. Animal behaviour studies in laboratories, in contrast, are often planned in minute detail. The behaviour under study is not only produced through exacting training procedures, it is also studied and evaluated

according to elaborate theoretical criteria. We too conducted our early research in this manner. An unexpected discovery, described below, forced us to depart from this way of organizing the research. We began to interact more spontaneously with the apes, we did things that both humans and apes found exciting and we began to improvise the research on the basis of how our interactions actually developed. In some sense, we became ourselves the subjects of a research that no one controlled in advance. Gradually we discovered that we developed an *intermediary* culture with both human and bonobo features. The human language that we tried to produce, study and evaluate according to preconceived models did appear, but in a different form than these models made us expect: it turned out to be more tightly integrated into our daily doings and interactions than we originally assumed; more tightly integrated into the developing Pan/Homo culture. Yet, we recognized what emerged as a form of human language. Precisely because we are confronted with language where we do not expect to find it – in forms of everyday life shared with bonobos – ape language research opens our eyes to dimensions of language neglected by our Western intellectual tradition. This book attempts to communicate and clarify our discovery of these cultural dimensions of language.

Understanding the discoveries in terms of culture

The teaching methods early ape language researchers used reflected their notions of language. If they thought that speech was essential, then they tried teaching the ape how to produce human speech sounds.[2] If they thought that grammar was essential, then they tried teaching the ape how to produce grammatical combinations of abstract symbols.[3] These early projects probably said more about the researchers' models of language than about language itself. Despite the perceived success of these projects, the results did not necessarily deem that the ape learned much about language. Apes are sensitive and good learners. Therefore, they often learned what the researchers wanted, but was it language or rather just a behavioural counterpart to someone's theory?[4] If the project failed, the ape did not learn what the researchers desired. Did they then prove that apes cannot acquire language, or rather that their assumed conceptual schemes could not be realized in the form of ape behaviour? There is also the possibility that the ape did acquire rudimentary language, but the researcher did not recognize it because the ape failed according to the technical criteria.[5]

The LRC approach to ape language is unique, as it is not designed on the basis of specially thought out models of language. The approach developed only after the revelation of the bonobo Kanzi's acquisition of language in a way no one expected, planned for or forced. This is important, since his behaviour thereby became less contaminated by our opinions about what 'true' language 'must' be like. Furthermore, Kanzi acquired language similarly as human children do: spontaneously and without training. This prompts the conclusion that we, by bracketing our opinions about language, accidentally hit upon the biological wellspring of language in another primate species. Hence, if the notion of language that governed our early and less successful research remains prevalent in the scientific community, then we may now begin to recognize important but neglected features of human language through study of another species. Ape language critics such as Herb Terrace et al. (1979), Joel Wallman (1992) and Steven Pinker (1994) apparently assume that we already know the most basic features of language as it exists in humans. Their question, therefore, is merely if apes can acquire language in this sense. We argue that it is possible to use the facts of Kanzi's language acquisition to examine this assumption as an open question: do we really know the most basic facts of language as it exists in our own species?

Laboratory studies of animal behaviour are normally conducted as a matter of routine. The scientist typically starts with an explicitly defined theory and designs methods of data collection confirming or disconfirming the theory. 'The drama takes place in an experimental setting that has been rigorously designed in accordance with a theoretical construct called a paradigm', Merlin Donald (2001: 17) explains. A risk of this approach is that the researcher never learns anything truly new, beyond the controlled intellectual framework in which questions are formulated and possibilities envisaged. As a consequence of the unexpected manner in which Kanzi acquired language, our situation differs. Instead of having a confirmed but not very startling theory in our hands, we have results that contrast deeply with our original ideas and expectations, requiring further philosophical reflection on our research. Sometimes the only way to answer a question is by making new discoveries. Our challenge is to arrange and describe the discoveries we already have made, and thereby begin to understand their significance.

So, what did we discover that was so remarkable about Kanzi's language acquisition? The difficulty of answering this question is our reason for writing the book. We ask the reader to be patient and to post-

pone assessment until he or she has read the entire book. What we have found can only be communicated slowly, step-by-step, and each aspect of what we have found requires elucidation in order to be understood. In addition, many tendencies in contemporary culture hinder understanding, and they must be tackled. When the reader has followed the entire exposition in this book, it will be clear why it was important to be patient and to postpone judgment. But let us take a first step.

At the LRC we have always used keyboards with abstract symbols, so-called lexigrams, to which the apes point when they communicate (see Appendix 2). These keyboards were originally connected to a computer in order to obtain unambiguous data of the apes' communications. Today, the most commonly used keyboard is a printed version coated with plastic. This format makes the keyboard handier and more usable for the purposes of daily life: they are easier to carry, they can be multiplied and spread out wherever the apes move, and they are cheaper to replace when the young apes destroy them. In the beginning of the 1980s we trained apes to use these lexigrams. In order to obtain milk, for instance, they had to point to the abstract sign for milk. Little Kanzi, who was not trained because we thought he was too young, began on his own initiative pointing to lexigrams, but in a more spontaneous and expressive manner than older, trained apes. He sought eye contact and responded surprisingly appropriately to what we said to him in English. We immediately changed strategy. We began to interact more spontaneously with Kanzi, and subsequently with his younger sister Panbanisha. We began to use English in tandem with the keyboard, and always for the purpose of negotiating everyday-life activities that engage apes, such as travelling in the forest looking for food. The connection between lexigrams and English was further established for Kanzi through the use of electronic keyboards that sound the English words in correspondence to the lexigrams. So, instead of training Kanzi, we simply talked with him and waited to see what would happen. His understanding of English soon exceeded by far his ability to express himself via the artificial keyboard. When Savage-Rumbaugh first began to test Kanzi's language competency, she therefore focused on his comprehension of spoken English. This is what we judge can be communicated at this stage of the exposition.

The attempt to understand the significance of Kanzi's way of acquiring language is as old as the research itself. When the first results were published in monograph form, Sue Savage-Rumbaugh et al. (1993) emphasized the following three features of how Kanzi and his younger sister Panbanisha acquired language:

1. Language is acquired spontaneously and observationally, not through planned training.[6]
2. Comprehension precedes production, and drives language acquisition.[7]
3. Early exposure to language is essential.[8]

These points are still true and important as observations, but today we interpret them in terms of culture. The manner in which Kanzi acquired language shows, we think, that language cannot be abstracted from culture. First-language acquisition occurs as an aspect of a more comprehensive process that we call 'enculturation'. What we originally described as *comprehension* of spoken English, for instance, we now describe as a broader ability to *act* in connection with words in the circumstances of a humanlike culture. Our ideas are related to those developed by the cultural psychologist Jerome Bruner, who studied language in children and decided that 'you could only study language acquisition at home, *in vivo*, not in the lab, *in vitro*' (Bruner 1983: 9). When Bruner published *Child's Talk: Learning to Use Language*, he did not consider the possibility that great apes can acquire language the same way human children do: at home, *in vivo*. That they do motivates seeing language as even more profoundly associated with culture than hitherto has been conceived. Thus, we do not merely see language as embedded in culture, but identify language – as it is originally acquired during what Bruner called 'immaturity' – with the broader matrix of everyday life. When the cultural matrix – the primal language – is in place, it is possible to learn a second language, a foreign language, a specific language, without developing the entire matrix again. What is acquired in childhood, then, is fundamentally different from a specific language. Kanzi's language development motivates a radical and, as far as we can see, unprecedented distinction between first- and second-language acquisition.

The term 'enculturation' applied to apes is not meant to imply that culture is uniquely human, and that apes can become cultural beings only by being reared in humanlike cultural environments. Although we follow Barbara J. King (2002) in questioning the fruitfulness of the notion of clearly demarcated 'transmission mechanisms', a growing number of observations indicate that various kinds of cultural transmission of information, habits and techniques are common among the animals.[9] Observed behaviours cannot automatically be categorized as biologically inherited adaptations that developed during the course of evolution, because many living creatures also have cultural histories

that are unique for different animal societies. That bonobos respond profoundly when they are reared in humanlike cultural environments (where they still are respected as bonobos) is just further evidence of these cultural facilities in animals. The reason human culture is emphasized in our study is simply that human language, as we see it, is integral with human culture. It is perhaps because our social, emotional and cultural sensibilities as a primate species are not so different from those of the great apes that we can stimulate young and still immature apes to develop aspects of human culture harbouring language. We do it through social, emotional and other channels with a longer evolutionary history than the mainly cultural history of human language.[10]

The term 'culture' has two aspects. The first, increasingly emphasized in biology, is the transmission of information non-genetically from animal to animal and from one generation of animals to another. The second aspect of culture, which is more important for us, is the content of a culture: a shared way of living containing characteristic activities, tools, environments, communication means, social relations, personalities, games, gestures and so on. What is culturally transferred is itself a culture, or 'way of life', as Frans de Waal (2001: 31) says in his definition. What we think our findings indicate is that this cultural content, the 'daily stuff of life' (Fox and King 2002: 11), is perhaps the most important aspect of how the culture is created afresh in new generations (Savage-Rumbaugh, Fields and Taglialatela 2000, 2001). A dichotomy between cultural content and mechanisms of transmission is difficult to maintain, for the culture is not merely a set of easily demarcated skills but part and parcel of the creatures we are and the world we inhabit. A fruit tree in the vicinity of some animals is not simply a brute fact of the animals' physical environment; rather, it is characterized by how the animals live together around the tree: how members of the group collect fruit, travel, play, hide, hunt, sleep, and coordinate these activities in interaction with each other. The fruit tree has a function in the animals' way of life: 'the field of living does not mean merely a space for living but is a continuation, a living extension, of the living thing itself', the Japanese biologist Kinji Imanishi (2002: 27) remarks.

Culture often affects the environment physically, but culturally modified forms of behaviour also change the function of the environment by making it accessible in new ways. A feature of the environment that previously was irrelevant can become relevant when a new behaviour develops. A fruit tree that some animals learn to climb becomes a different element of their lives than a tree that merely provides shelter when it rains. The environment changes drastically for the animals,

although it is physically the same. This subtle connection between culture and environment opens up a perspective important to understanding the evolution of at least some features of our human language. If environmental changes drive evolution, and if culture is indistinguishable from environment, then cultural changes can drive evolution by transforming the selection pressure, just as environmental changes are known to do. The possibility of gene-culture coevolution has been suggested by several authors (Lumsden and Wilson 1981, Boyd and Richerson 1985, Durham 1992). By describing the cultural dimensions of language, it becomes possible to hypothesize a gene-culture coevolution of human language. At least some aspects of our speech organs, or ability to control them neurologically, can be the result of mutations that had survival value in cultural environments dominated by language. Evolution can tune up culturally developed forms of interaction and make us better adapted to our culturally permeated environments. By examining the extent to which an infant belonging to another primate species can acquire language through enculturation, our research sheds light on the possibility of such an interaction between a primitive language-culture and genetic evolution in our past. Wolfgang Enard et al. (2002) report a uniquely human variant of a gene named FOXP2, a variant assumed to be associated with the articulation of speech sounds. The fact that this mutation was so successful in our species can be interpreted as the result of interplay between culture and genetic evolution.[11] It is important to remember, however, that if a young bonobo can learn to communicate in human language, then there is reason to see language as a cultural arrangement of traits that in most cases were selected for other functions. We are not suggesting a 'Baldwin effect' for language, then, since we do not claim that language in its entirety has become a genetically heritable adaptation (see Weber and Depew 2003). Only limited traits related to language may have evolved genetically and become heritable in cultural environments already dominated by language. Moreover, it is difficult, or even impossible, to make a clear-cut distinction between biology and culture, not least because of the intrinsic connection between culture and environment.

Here, then, is the cultural meaning we now attach to the three points emphasized in the 1993 monograph:

1. Language is so thoroughly intertwined with how we function spontaneously together that it cannot be learned through planned and explicit instruction. A caregiver may teach a child or ape this or that

detail about language, but language as such cannot be learned in a consciously planned manner; rather, only by living together.
2. Linguistic expressions have their uses in the culture, and intimate familiarity with the culture must develop in the child or ape before he or she can start using linguistic means within these contexts. What would 'Good morning!' mean uttered by someone who lacks the experience of waking up in the morning and acknowledging another person with at least a glance?
3. Culture is not external to us, but constitutes our way of being. Therefore, a mature ape who has already developed a life where human language does not fit can only to a limited extent become a being with this form of language. Consider also the symmetrical impossibility for a mature human to unlearn his or her language. If you want to create a human who does not possess language, then early exposure to life without it is just as important as early exposure to language is to normal language acquisition.

Given the philosophical nature of this book – reflecting on our findings about language in apes without preconceived theory in an attempt to learn more about neglected dimensions of language – we allow ourselves to be personal, to ask questions to which we may not always have answers, and generally to let our thoughts take us where they desire. Philosophy engages the whole human being and not just the professional tendencies in us. It treats not only consciously entertained ideas, but also the deeper attitudes that these ideas express: our *will* to entertain the ideas; their *charm* for us. Philosophical thought thus concerns us personally in a way that scientific work does not necessarily do. Although we discuss language as an intrinsic aspect of culture, then, this is not a study in linguistic anthropology, but a book about how we contemporary humans tend to conceive of language, namely, as if it were a separate instrument. Kanzi disturbed this tendency, and the book is our attempt to derive as much nourishment as possible from this disturbance. Our reflections will have relevance for sciences such as linguistics, psychology and anthropology, and we hope that the book will stimulate new approaches in these fields and support related ways of thinking. Although culture is central for us, then, it is important to keep in mind that we do not 'apply' a specially elaborated anthropological (or linguistic) perspective to collect empirical data about language. We rather use the thought-provoking example of Kanzi's language acquisition to vivisect our most deep-rooted human attitudes to language – as it is acquired the first time when we are very young. Our whole point

of departure is that we must think afresh what it means to have language. For instance, it is not sufficient for our purposes to describe language as a 'tool for conveying sociocultural knowledge and a powerful medium of socialization' (Ochs 1986: 3), since language would be taken for granted as a separate tool and medium. It is not sufficient to claim that 'part of acquiring language is the acquisition of the social meaning of linguistic structures' (Ochs 1986: 7), since that would presuppose a separate level of linguistic structure. It is not sufficient to claim that 'grammar needs anthropology as much as anthropology needs grammar' (Du Bois 2001: 87), for we suspect that it is a category mistake to apply the notion of grammar to the acquisition and use of the first language. As we conceptualize language, there is no room for a linguistic relativity principle of the kind formulated by Benjamin Lee Whorf (1956), since such a principle would presuppose that language is a separate mechanism, medium, tool, system or structure. Our notion of the cultural dimensions of language goes beyond merely applying a cultural perspective to language as an 'entity' and studying it as 'embedded' in culture. In talking about the cultural dimensions of language we question the very idea of language as a demarcated entity, system or structure. That we question this idea does not exclude the possibility that vital aspects of human language, for instance, our ability to control our voices neurologically, can be demarcated and studied in the laboratory. They certainly can. What we are doing is supplying the broader picture of language, thereby counteracting the temptation to oversimplify language and identify the whole of language with one of its aspects. We believe these considerations justify that our work concentrates on fresh and unexpected examples of the bonobos' lives with speaking humans, and explores what we thereby can learn about language in its cultural dimensions.

We are not going to define the concept of culture, although it will become clearer through our investigation. A unitary definition of the concept, in already established terms, would reduce our possibilities of learning more about previously unexplored dimensions of language. We should not start the inquiry by limiting our learning capabilities. Instead, the entire exposition will deepen our understanding of the dimensions of language in the lives of enculturated primates. However, some remarks may already now elucidate what we mean by culture. Though learning from others is an aspect of culture, we do not always discuss culture as a 'non-biological' way of transferring behaviours to others. We emphasize the *way of life* shared by a group of individuals. Our notion of culture is related to Ludwig Wittgenstein's (1953) notion

of forms of life. A form of life can be anything from a primitive pain reaction to a way of building houses while talking with each other. It can also be an entire culture (consisting of an orchestrated assembly of forms of life). We find it artificial, at least for many of our purposes, to isolate cultural behaviours in the hurly-burly of human life. We treat the tears in the eyes of a weeping person as part of the human way of life, just as the handkerchief used to dry the face belongs to human culture. It would be strange to point to the handkerchief and say, 'that's culture', and then to the tears and add, 'but those are merely biological'. Surely the tears belong to the practice of drying the tears out of one's eyes: they are culture and biology at the same time. Although our understanding of culture is related to, for instance, Bronislaw Malinowski's (1944) anthropological concept, our emphasis is on easily unnoticed similarities in how humans move, gesture, act and talk: on relatively common traits that we develop already in early childhood. Thus, although we see large-scale phenomena such as myths, religions and economic systems as significant aspects of culture, we normally emphasize more prosaic aspects of life developed spontaneously through exposure to how humans characteristically move, gesture, act and talk. The concrete details of life attract the attention of the young and immature ones and transform them substantially.

There are, of course, many anthropologists who emphasize the importance of our human everyday environments. We are fascinated by the social anthropologist Tim Ingold's (2000) criticism of the dichotomy between biology and cultural environment, and his questioning of the notion of a clearly demarcated language capacity. However, when he emphasizes that speaking always is speaking a particular language, we think he makes it difficult to discern the common cultural dimensions of human language that unite speakers in different parts of the world when they act with words in their lives.

Culture, as we think of it, develops primarily in early childhood, in interaction with more mature individuals, during what Bruner called 'the period of immaturity', and we believe there is reason to speak of common human cultural traits emerging in this early stage of life. Specific cultures can be seen as variations of more general forms of human life, just as species are viewed as variations of the themes set by a common ancestor. We see cultures as modifications of what we are as human primates. To assume that culture always is local (or 'culture-specific') and biology universal is to make the concept of culture, as an early orchestrated assembly of spontaneously developed forms of life, less interesting from a biological point of view than we think it is. The

genetic component may be prominent, which means that our notion of cultural forms of life is distinct from Richard Dawkins' (1976) 'memes' that are supposed to propagate more or less independently of how our genomes function during ontogeny. Our notion of the relation between the 'system of learning' and the 'system of evolution' is more related to Gregory Bateson's view: 'The *unity* of the combined system is *necessary*' (Bateson 1979: 149). Moreover, culture is not merely a set of underlying beliefs or norms according to which we live: that idea presupposes a distinction between culture and life that we reject. Culture is how we tangibly live, act and create. This tangible life has biological significance, for we have witnessed how it transforms Kanzi and affects how his body functions, and thereby also how the environment functions for him. Kanzi not only understands language; his physiognomy has changed, and his body, as it functions in everyday-life activities, has become even more humanlike than other bonobos' bodies are. His body changed in more subtle ways than those discussed by Bonner (1980: 22). Bonner's examples of how the body is affected culturally are circumcision, ritual scars, tattoos, and skulls flattened by binding during infancy: results of consciously made operations. But we are talking about how Kanzi's body – his gaze, posture, voice and movement patterns – changed unconsciously simply by maturing in a bi-species cultural environment in which he was stimulated to act, create and interact in certain new manners imbued with language.

Is the language Kanzi acquired the language we tested?

Early research with Kanzi, following the discovery of his language acquisition without training, split in two opposite directions. The manner in which his language was cultivated became dramatically different from how it was tested in the laboratory. A reader wishing to see this ambiguous nature of the early research may watch LRC documentary *Bonobo People* from 1994, a year after the monograph was published. The Japanese television company NHK has filmed the research almost since the start and produced some very instructive documentaries (we will often refer to scenes in these documentaries). In *Bonobo People*, Savage-Rumbaugh was allowed to edit some of the NHK material and present her own insider-view of the research. The film begins by showing how Kanzi's language was developed in the context of more or less typical everyday activities in the forest surrounding the laboratory, with no attempts to filter out the gestures, glances and other so-called contextual features that also characterize normal linguistic

communication between humans. The film illustrates how Kanzi's language emerged in activities that are normal to apes, such as travelling in the woods and finding food, but these activities were enriched with linguistic interaction. In one scene, for instance, Sue asks Kanzi to break some sticks for the fire they are making and he immediately does so. In another scene Kanzi suggests, on the keyboard, that he wants to go to a particular place in the forest but Sue is not sure what he means, so she makes guesses in English to which Kanzi listens attentively. When she finally guesses correctly, Kanzi nods and begins to walk. Later in the film Kanzi's language is tested in the laboratory. However, the scenes become dramatically different. In some tests, Kanzi wears headphones and responds to word recognition tasks formulated by a researcher in an adjacent room. In other tests, Kanzi responds to novel sentences formulated by Savage-Rumbaugh, who hides her face behind a welder's mask. The purpose of the test design was to eliminate the gestures, glances and other contextual features that also characterize normal communication between humans, but that are seen by many linguists and ape language critics as 'extra-linguistic assists'. The purpose was to prove that Kanzi really understood words and what they stood for, as well as sentences and the meanings their syntactic structure determined. This way we hoped to confirm that his responses to test tasks in fact were mediated by true understanding of 'language proper'.

An important purpose of the test design was the elimination of the so-called 'Clever Hans' phenomenon. Clever Hans was a horse who was supposed to be able to count, since he could strike the ground with his hoof the number of times his trainer requested. It was discovered, however, that the horse's behaviour was not as complex as that of counting. He merely responded to his trainer's posture. When the horse struck the ground the correct number of times, the trainer immediately became more relaxed (probably without being aware of it himself), and this was what made the horse stop striking the ground. The 'Clever Hans' phenomenon was a prominent theme in the ape-language debate a few decades ago (see Sebeok and Rosenthal 1981). When we designed our experiments, we wanted to rule out that Kanzi's behaviour was mediated by skills less complex than those of language; that is, we wanted to avoid non-linguistic cueing.

Kanzi's achievements in these controlled tests are impressive and are reported in detail in Savage-Rumbaugh et al. (1993) and in the video documentaries. In *Bonobo People*, for instance, he responds appropriately to novel sentences such as 'could you carry the television outdoors, please', and 'can you put your shirt in the refrigerator'. He comprehends

these requests even though he does not see the speaker's face. The formal tests are invaluable because so many variables that might interfere with what we wanted to explore were controlled, and because Kanzi's language comprehension became so clearly visible for anyone wishing to see it with their own eyes. The tests exhibit similarities between Kanzi's language comprehension and our human understanding of language. Educated humans familiar with the use of electronic sound equipment would typically pass these formal tests, even though dimensions that are salient in everyday language use are eliminated and would pose problems for children or people who have never seen a microphone. It was not clear that an ape would function in such extreme conditions as those in our tests. Now we know they can.[12]

The question we ask today is whether the early tests disregarded more important aspects of what human language has in common with Kanzi's conduct. We recently warned about the danger in ape language research of confusing language with what might perhaps just be tempting ways of conceiving language intellectually. We emphasized that Kanzi's language was uncontaminated by our opinions about language, due to the unplanned manner in which he acquired it. The tests, however, were planned in minute detail. They were planned on the basis of definite ideas about the essence of language; for instance, the idea that language can be identified with vocabulary and grammar. These ideas were so fundamental to the debate about ape language in which LRC researchers participated that it was difficult to pause and consider the significance of the fact that the research had split in two opposed directions; one in achieving the results, another in testing and reporting them.

The tests demonstrate that Kanzi understands human language in the formal sense demanded by many linguists. He obviously understands words and what they stand for, and he is able to respond properly to a great variety of novel sentences. What we now want to investigate, on the basis of the intellectually less contaminated facts of how he acquired language, is whether what we tested merely was the tip of an iceberg. Perhaps the tests were a group of standardized symbol-centred practices that we were able to develop in the laboratory, together with Kanzi, because all of us were acting in the same more natural and comprehensive landscape of linguistic interaction. Perhaps the development of the symbol-centred activities gives a glimpse of how children acquire the grammatical perspective on language that comes with sitting down on a chair learning to read and write. But did we really isolate 'language proper' when we construed these symbol-centred tests in cooperation with Kanzi? When 'extra-linguistic assists' were filtered out, was it

perhaps rather the groundwork of language that was thrown out the laboratory door?

What did Kanzi acquire in acquiring language?

We want to learn more about language from how young Kanzi acquired it and used it in daily communication with humans. The Chomskyan objection that the acquisition and use of language merely constitute indirect evidence of a hidden language faculty, and that apes cannot acquire language at all because they lack this hypothesized mechanism, is bracketed for a while. The way theoretically uncontaminated data erupted at the LRC in the form of unplanned linguistic interactions with Kanzi contains more vitality than ideas and dichotomies derived from almost fifty-year-old academic controversies between behaviourists and cognitivists. One must decide what sheds most light on what, and it seems philosophically and scientifically more invigorating to use LRC data as a point of departure for evaluating the opinions of behaviourists and cognitivists, than to let these well-known and often repeated standpoints trivialize some unexpected discoveries in the field of language research. Therefore, we begin with describing the LRC experience of language in enculturated apes, and return to the theoretical issues later. These issues look surprisingly different against the background of a philosophically clarified understanding of our findings.

The discovery of young Kanzi's acquisition of language was not in a controlled training or test session. As already mentioned, no one tried to teach him the use of lexigrams and no one tested his skills. Kanzi was thought too young to learn. Instead, it was his adopted mother, Matata, who was being trained, without success, while little Kanzi was playing, watching and interfering with the training. It was when Matata one day was taken away from the LRC for breeding purposes that the discovery was made:

> To everyone's astonishment, on the first day of Matata's absence, Kanzi produced 120 separate utterances using twelve different symbols ('banana', 'juice', 'raisin', 'peanuts', 'chase', 'bite', 'tickle', 'orange', 'outdoors', 'swing', 'cherry', 'sweet potato', and 'ball') . . . Our 'human perspective' prevailed because it lacked competition from Matata. It became increasingly clear that Kanzi had learned a great deal more about how we did things than he had bothered to demonstrate in the past. Now, with Matata gone, all of what he had learned, but rarely if ever displayed, came pouring out of him. (Savage-Rumbaugh, Shanker and Taylor 1998: 22–3)

Evidently, Kanzi had somehow learned how to use lexigrams communicatively. But *what* had he learned? How would we make his new behaviour scientifically reportable and decide whether it was language? The first attempts to test his skills were futile:

> In spite of his abilities, Kanzi was not ready to take a blind test. Indeed, he was not ready to take any test at all, blind or otherwise. He was happy enough to use the keyboard to talk, but he had never previously been required to sit still and answer a lot of questions that, from his perspective, were meaningless, in order to earn a morsel of food. (Savage-Rumbaugh, Shanker and Taylor 1998: 26)

Today we ask if the impossibility of testing young Kanzi's skills perhaps is one of our most significant results. Certainly, from the point of view of achieving safe but perhaps also harmless experimental results, it would be preferable if the ape could be so kind and sit still on a chair and answer the experimenter's carefully planned questionnaire. But what if the experimenter's ideal of having her subject sit still and answer her questions is unattainable when the groundwork of language develops in a young primate? That Kanzi's early linguistic interactions did not consist in sitting still answering questions might very well be a design feature of first-language acquisition. All apes who researchers previously tried to teach language sat still while performing stereotypical tasks in which symbol use was introduced in controlled ways. These apes might have been ideal subjects of laboratory research, but their behaviour was not as impressive as Kanzi's. We therefore ask if the fact that Kanzi did not acquire language sitting still also characterizes *what* he was acquiring. Is language perhaps integral with moving about in our mundane environments doing things together? Let us look more closely at how Kanzi's language was cultivated, after the discovery that he acquired language spontaneously prompted rearrangement of the LRC approach to ape language:

> In general, the rearing environment was designed to promote communication about topics of interest to apes. Food was dispersed at identifiable locations in a 55-acre wooded area, and most of the day was spent traveling from one food source to another, playing and resting just as would be the case in the apes' natural environment. Human companions accompanied the apes at all times, using both speech and geometric symbols to communicate their intentions regarding travel, play, rest, etc. and encouraging the apes to attend to these communications. The apes, like children, were cared for as

> needed and allowed to play and interact socially with persons and other apes as they desired.
>
> This environment was intentionally designed as an informal, relaxed setting in which apes could be given the opportunity to hear and see people talk about things that were of particular interest to them. Such opportunities were not experimentally structured but rather occurred spontaneously within the daily events of traveling in the forest in search of food. Communications differed constantly and were always linked to the current context. For example, if dogs or turtles appeared in the woods, they would become, for a short period of time, the topic of conversation. Later, it might be the snake on the path or the ice in the cooler at 'Lookout Point' if it were a hot day. It was the events of the moment that determined the topics of conversation rather than an experimental protocol. Experimenters did not decide which words, if any, an ape should learn. This was left up to the individual ape, and, in general, the apes' first words reflected their own particular interests. (Savage-Rumbaugh et al. 1993: 40)

Read this description slowly and imagine young Kanzi travelling in the forest, climbing trees, tracing the path to Lookout Point while always listening to his human companions' utterances, sometimes responding to them, at other times expressing himself by using the keyboard. Imagine this situation, and compare it to how Herb Terrace, in a team of sixty teachers, less successfully tried teaching the chimpanzee Nim Chimpsky to use American Sign Language (ASL):

> The room used as Nim's classroom was bare and small, a mere eight feet square. This was by design. I felt that Nim would not romp around too much in a small area and would be more likely to concentrate on the activities introduced by his teachers. I also felt that a bare room would minimize distractions . . . Nim's nursery school contained nothing familiar. (Terrace 1979: 49–50)

Observe the differences between these two approaches to language acquisition. Kanzi acquired language in the mere living of his life, surrounded by cultural objects, gestures and practices, and typically by being 'distracted' by fascinating things. Nim, on the other hand, was less successfully taught signing while sitting down, with the door closed to life outside the classroom. Another difference is that Kanzi's language was cultivated in an unbound fashion. One could not walk beside him

and draw a demarcation line between when his language was being fostered and when it was not. That is another design feature of Kanzi's language acquisition. Nim, however, was taught signing during clearly defined periods of time:

> Five days a week, for five to six hours a day, volunteer teachers worked with him in the classroom on what proved to be a rather grueling schedule. (Terrace 1979: 56)

These two ways of learning language have obvious parallels among us humans. Kanzi's language was fostered the same way very young children acquire their first language, while Nim was taught ASL just as older children – who already speak! – typically learn a second language in school. In second-language learning, however, the fact that the pupils already can speak is relied upon. Even if they are not allowed to speak or hear their mother tongue, the foreign utterances are used within the familiar activities into which they were initiated when they began to speak the first time, such as greeting each other, requesting things and handing them over, promising, narrating, singing, joking, asking questions, counting, etc. This has an interesting parallel in Kanzi's case. When his language was tested in a controlled laboratory environment, he clearly resembled a pupil studying a second language in school. In contrast to Nim, however, Kanzi had *already* acquired language the same way human children acquire their first language. Having that background, he could be adjusted to the new ascetic testing activity, with its focus on sitting down and responding to mere words and sentences. This was possible because he already knew these words' life outside of the laboratory. The standardized laboratory activities were parasitic on unbound linguistic interactions outside of the laboratory. That is basically the way it is with school children learning grammar too![13]

The comparison between Kanzi and Nim is meant to facilitate seeing the relevance of Kanzi's way of acquiring language for our concept of language. Comparing Kanzi and Nim is relevant also because it was on the basis of his own attempt to teach sign language to Nim that Herb Terrace formulated his famous critique of ape language research (Terrace et al. 1979). Project Nim is further discussed in Chapter 3.

Our question, then, is: can we learn more about the dimensions of language from how Kanzi acquired it? We can observe that the two processes of language learning, Kanzi's and Nim's, focused on entirely different things. Project Nim focused on teaching Nim a vocabulary of hand signs and hoping he would later combine them grammatically and

thereby sign creatively in real-life situations: 'a chimpanzee who could grasp some of the essentials of sentence construction would be embarked on a path that had previously seemed closed to nonhumans' (Terrace 1979: 9). Kanzi's language learning, however, was from the very outset focused on creative language use in real-life situations. The idea was not that a hypothesized grammatical mechanism should start ticking inside Kanzi's brain making him capable to take part in creative linguistic interactions later on (although that perspective sneaked into the formal tests). Kanzi acquired language while he was travelling in a forest, which is real life for an ape. He acquired language in the context of climbing trees, tracking forest paths, searching, finding, preparing and eating food, chasing others and being chased, tickling others and being tickled, frightening others and being frightened, pretending to bite others and pretending to be bitten, comforting others and being comforted, giving food to others and receiving it, being aggressive towards others and making friends again. The caregivers' primary task was to share these activities with Kanzi, to experience them with him while simultaneously talking about the activities, as humans spontaneously talk with children (and with each other) in tandem with experiencing and coordinating actions and events.[14] The idea was not that symbolic language should finally make it possible to share perspective with Kanzi, in the way that Terrace hoped Nim's signing would open the door to Nim's mind. Kanzi already shared perspective with his human companions when his language developed. His linguistic development deepened the shared perspective – what we now call the intermediary Pan/Homo culture – but language was not a prerequisite for a shared way of living. It was rather the other way round.

The LRC experience of language now stands before us in the form of a comparison with Project Nim. The purpose of the comparison is to create a vantage point enabling us to see the dimensions of Kanzi's language in his manner of acquiring it. We will now formulate this understanding of Kanzi's language. Here is what we think the above arrangement of facts reveals about the true foundation of LRC work since the day it turned out Kanzi acquired language without training.

Language as intrinsic aspect of culture

Before Kanzi, researchers tried teaching apes language as if human language were one of the second languages we learn in school. This was true also of early work at the LRC. It is tremendously difficult to remember what language is in ordinary life, and the researchers' notion of

language was basically that of a second language. It was believed that language existed as an insulated linguistic system *L* (vocabulary and grammar); one that could be acquired in separation from (or in parallel with) the *life* in which linguistic expressions are used in so many creative ways. Terrace even hoped that this creative real-life use of language would appear miraculously once a portion of the ASL grammar started ticking in Nim's brain. The comparison between Kanzi and Nim shows that Terrace, and perhaps even more so his precursors, overlooked the fundamental difference between first- and second-language learning. There is no miraculous effect of grammar on the life we live. First-language learning has the same complexity as the effect Terrace hoped grammatical rules would have on Nim's future conduct.

It was because early ape language researchers did not pay sufficient attention to the culture where words belong that their projects became less successful. Similarly, the attempts in artificial intelligence to represent language use as a purely syntactic process cut words loose from their roots in human forms of life. Researchers falsely believed that complex humanlike language use would appear automatically when a syntactic mechanism started working. The results were equally disappointing in both fields of research. Winograd and Flores (1986) discuss their unsuccessful attempts to represent language syntactically in computers, and how the enormous difficulties of this project forced them to reject the distinction between linguistic knowledge and background knowledge about the world. Empirically oriented AI research made at least some of the workers in the field aware of what we call the cultural dimensions of language.[15] Ape language research met the same difficulties. Due to the emphasis on signs, the apes' lives were not prepared for the interactions that characterize human language use. The apes tended to imitate their teachers' signs because that was almost the only practice with signs they were exposed to due to their teachers' beliefs in miraculous effects of syntactic clockworks. We repeat: there is no miraculous effect of grammar on life. First-language acquisition has the same complexity as the effect many theorists assumed only hidden syntactic mechanisms would have on how we live and interact as human beings.

When we observe how similar the dimensions are in Kanzi's way of acquiring language and in human children's first-language acquisition, it seems less far-fetched that an ape can develop language. The dimensions are cultural rather than grammatical, everyday rather than formal, physiognomic rather than cerebral. First-language acquisition is not focused on the grammatical form of sentences, which would impose the erudite perspective of writing on a more natural process that occurs in

early childhood, before we undergo language education. First-language acquisition focuses on *doing* things together, on *living* together while communicating through any kinds of means: gestures, glances, touches, bites, displays and subsequently linguistic expressions as these are integrated with real-life situations. Considering the similarity between how human children and young apes use gestures, glances, touches, bites and displays, and given their similar curiosity, ability to learn, their desire to develop identity-forming bonds with others, it seems less surprising that apes have a propensity for acquiring forms of our human language. We are genetically, physiologically, socially and emotionally as closely related to the chimpanzees as dogs are to wolves. We belong to the primates as dogs belong to the canines. Yet, we tend to group chimpanzees and gorillas together as 'apes' with characteristic 'ape' behaviour and mentality that we think of as categorically different from ours. The more that primatologists such as Jun'ichiro Itani, Jane Goodall, Cristophe Boesch, Magdalena Bermejo, Takayoshi Kano and Frans de Waal studied these 'apes', the more these ideas lost their validity. If research with enculturated apes would complement primatological field studies helping us see the vast difference between first- and second-language acquisition, then we might begin to *expect* that apes can acquire abilities previously considered uniquely human. It is often asked: 'If apes have the capacity for human language, then why have they not developed it in the wild?' An important part of the answer is: just as evolution is not driven by an aim of developing *Homo sapiens*, so cultural changes are not driven by an aim of developing our human form of language, as if this form of language were some kind of ultimate state towards which all conscious creatures strive. However, in a young bonobo finding himself in a cultural environment where human companions speak and gesture to him while doing exciting things together, there arises a profound drive to develop more humanlike language.

Most of us have a tendency to oversimplify the nature of language according to our most recent and well-structured experience of language learning, as if language were one of the second languages we learn in school (when we already speak). We must, therefore, express the nature of our primal language more strikingly, so that it becomes easier to remember. Here is our suggestion: *Our primal language is an intrinsic aspect of culture. First-language acquisition is enculturation.* We remind the reader that this statement goes beyond merely seeing language in a cultural perspective, since it means that language itself has cultural extension; it is not merely 'surrounded' by culture. The symbols that linguists

use for first and second languages, L_1 and L_2, are misleading, since the use of the common symbol *L* suggests that what is acquired the first and the second time is the same kind of entity: a linguistic system (vocabulary and grammar). Even introducing the symbols *C* (for culture) and *L* (for a language) would be insufficient, for what we acquire when we begin to speak the first time is not a demarcated entity on which we can attach the label *C*. It is our life with words, the root system of specific languages. Life cannot be surveyed the way a cornfield can be surveyed; only *aspects* of life can be surveyed. When people's primal language differs, the differences are cultural: words are used in different yet still related lives. The language of time, for instance, changed with the introduction of clocks, but it is still related to the previous ways of talking about time. Our mother tongue, as studied in school, is therefore not what we describe as the primal language. It is rather the first 'specific' language that we learn sitting down on a chair studying reading and writing. Our ability to use our mother tongue correctly in speech and writing is our first second-language ability: a demarcated ability that we acquire when we already speak. Not until we begin to study our mother tongue in school does it make sense to hesitate and question whether we master our own language, or to be self-critical and suspect that we do not always speak correctly. The notion of speaking our primal language incorrectly in ordinary interaction is normally as absurd as the idea of living our lives incorrectly. Certainly we make mistakes in life and sometimes we even see our entire life as a mistake, but hardly in the sense that we made some formal mistake and thereby failed to be human (the way one can fail to produce a French sentence). There is no formal standard to follow when we speak in ordinary situations, ultimately, and that is an aspect of why native speakers do not make certain linguistic mistakes that often are made by foreigners (or by persons who speak their mother tongue in official situations): not because the natives master their own grammar perfectly, but because the grammatical standard that creates the possibility of correct and incorrect usages is introduced only when we already speak and begin to study and use our official mother tongue. Only someone who already speaks can express herself eloquently or sloppily, correctly or incorrectly: grammatical standards are *imposed* on an already functioning language, and do not make meaningful language possible. Language does not come into existence through our attempts to speak well. What may go wrong in natural interaction is that we fail to make ourselves understood, but there are many ways of handling these communication problems within our primal language.[16]

The term 'primal language' is meant to avoid confusing language, as it develops in childhood and continues to function throughout our lives, with the first second-language we learn when we already speak: the mother tongue. The terms 'primary language' and 'first language' would not avoid this confusion efficiently, although we occasionally use them as synonymous with the primal language. The primal language is not a more primitive language than human language: it is what human language *is*, when it is not confused with the external instrument of grammar.

If second languages, such as our officially taught mother tongues, are described in terms of vocabulary and grammar, then how should we describe our primal language in detail? What kind of account describes the language we acquire as children? Ludwig Wittgenstein (1953) invented an analogy to make it possible to at least catch glimpses of our primal language. Words, in the way Wittgenstein investigated language, belong to what he called language-games, rather than to languages:

> Here the term 'language-*game*' is meant to bring into prominence the fact that the *speaking* of language is part of an activity, or of a form of life. (Wittgenstein 1953: 23)

When we wake up at daybreak and say 'Good morning!,' for instance, it is just as reasonable to say that this expression belongs to a greeting activity (or 'game') as it is to say that it belongs to a language called English. When we spoke and smiled we did it as a greeting, rather than as a speaking of a specific language. It is almost irrelevant whether German or English is spoken in Wittgenstein's language-games. What matters is not the technically represented syntactic forms of expression, but the humanly experienced practices in which the expressions are used; the way gestures, glances, actions, objects and signs are used together in everyday situations, almost irrespectively of the specific language. Wittgenstein's language-games reveal dimensions of language that are general and concern us more directly than Noam Chomsky's formally abstract Universal Grammar, or Principles and Parameters. Language-games are not technical constructs, but are described in our common language, just as we can describe a card game or a procedure in the street to just about anybody else. Instead of ascending towards higher levels of formal abstraction within a technical and grammatical outlook on particular languages from all over the world, the language-game analogy takes us down to the common primal language of human reality. The analogy illuminates our everyday language practices that are

general as they stand: to describe them requires no abstraction or technical apparatus.

The general aspect of language, then, as we perceive it by sharing an intermediary culture with another species of primates, is not the drawing-board product Universal Grammar. It is rather the cultural root system that the language-game analogy illuminates. It is a common human way of life where words are incorporated and play basically similar roles, although dictionaries and grammar books differ. Cultural differences must not, of course, be neglected. Kanzi's culture is not identical with that of humans. It is a related way of life that developed between some humans and Kanzi and his sister Panbanisha (and always under the influence of the matriarch Matata), in the process of their unplanned language acquisition. Kanzi's culture is an *intermediary* form of life shaped both by human and bonobo gestures, desires, habits, mentalities and practices.

Now that we have accomplished a rough and preliminary distinction between our first language and second languages, mother tongues included, by discussing culture, we can reintroduce the term 'language' without being misled into seeing language as if it were a second language defined by its vocabulary and grammar. *Our primal language is the cultural matrix of specific languages*. The primal language is of a different *kind* from the forms of expression that grammarians have transcribed, standardized and catalogued in dictionaries and grammar books, as if they constituted autonomous linguistic systems. It is now time to describe the primal language in greater detail. In the next chapter, we describe design features of language as it emerged in Kanzi's and Panbanisha's interactions with humans. Linguists rarely emphasize these features, but they characterize also our human acquisition and use of language, as we believe we are able to demonstrate in our presentation of language in its cultural dimensions. Kanzi's primal language reveals the essence of human language.

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2
Design Features of Language

> *'We initiate them, into the relevant forms of life held in language and gathered around the objects and persons of our world.'*
>
> Stanley Cavell

If man is shaped by the same evolutionary mechanisms as the other animal species, then we can reasonably expect to find precursors of human language in the other primates. Detecting these precursors in apes' interactions has proved to be a difficult task. In an important anthology on primate behaviour, *Tree of Origin* (2001), edited by Frans de Waal, the psychologist Charles Snowdon discusses language as a problem for evolutionary biology:

> Of all the topics in this book, the origin of language is one of the most difficult to imagine emerging from our nonhuman primate ancestors. Evidence of cooperative hunting, of the cultural transmission of tool use, of empathy and reconciliation, of manipulating the behavior of social companions is clear in great apes and occasionally in some monkeys. In these areas it is easy to see much of our own behavior reflected in the behavior of apes and monkeys, and vice versa.
>
> But language seems to be fundamentally different. There seems to be nothing approaching the complexity of our vocabulary, our grammar, the concepts and ideas we can express about ourselves and our world, in our knowledge to date of primate communication. This gap creates a potential crisis for an evolutionary biologist: Is language a special creation unique to our species, or can we find some evidence for precursors of language and speech among our nonhuman ancestors? (Snowdon 2001: 195)

Based on how language emerged in Kanzi's interactions with humans, in cultural dimensions, we suspect that the gap Snowdon mentions as a deep evolutionary problem is a myth that arises when we see language as if it were an isolated second language. It need not be difficult to find precursors of human language in the behaviour of other primates once an aspect change is achieved in our perception of language, from grammar to real-life interactions in culture. Snowdon himself mentions such precursors, evidently without perceiving them thus. Cooperative hunting, cultural transmission of tool use, empathy and reconciliation, manipulating the behaviour of social companions: these are complex social activities performed while gesturing, vocalizing, touching and glancing at each other. That was how days were spent with young Kanzi in the forest, although we enriched the activities with interactive use of human speech and lexigram symbols. These new expressions did not have an autonomous existence as 'a language', but were integral with humanlike activities, just as 'Good morning!' is an expression of our language because we humans greet each other in the morning using such words. The bonobos' lives were transformed so that they could begin to harbour interactions characterizing human language use. Their entire lives underwent a modification called 'language acquisition.' In order to realize the possible abundance of precursors of human language in other primates, we are helped by perceiving language in its more tangible cultural dimensions. In a new book by Barbara J. King, *The Dynamic Dance* (2004), such a perspective is used to reveal creative communication among African great apes.

In his contribution to *Tree of Origin*, Snowdon employs a methodology for evaluating linguistic abilities in animals developed by the linguist Charles Hockett. Instead of applying an all-or-nothing criterion of language, Hockett (1963) formulated a set of sixteen design features of human language that, to various extents, are found in the communication systems of animals. We think that Snowdon's attempt to trace a linguistic continuity among the primates using Hockett's broader approach to linguistic phenomena is valuable and has led to many important findings about the communicative uses of vocalizations in other animals. However, since we believe that most current notions of language are unclear and problematic when they are applied to our first language, we think the methodology can be improved even further. It should be even more focused on the conceptual question of what we *mean* by talking about linguistic phenomena as they appear for the first time in young children. All of Hockett's design features, or almost all of them, focus on language as a system of expressions. His choice of design

features expresses basic aspects of the grammatical perspective on language, just as our own controlled tests with Kanzi did. But given that the dimensions in which Kanzi acquired language were cultural, we choose not to evaluate Kanzi's language on the basis of Hockett's design features. Such a procedure would once again split our research, and make the evaluation of our data dependent on ideas we think can be questioned on the basis of how the results were achieved. Therefore, we develop our own catalogue of design features, one that reflects how Kanzi actually acquired language. In the course of developing our catalogue we show that these features characterize not only Kanzi's behaviour, but also our human behaviour when we first acquire and begin to use language. This procedure is not meant to prove a truth claim – that Kanzi has language – but to clarify what it *means* that Kanzi has become a creature with language. Because so few understand the relevant sense in which Kanzi has language, we see little point in trying to prove that he has language. Our point of departure is that most theories of language fail to characterize language as originally acquired by humans. Even the cultural psychologist Michael Tomasello (2003) conceptualizes language in grammatical rather than cultural dimensions, as if our primal language was one of the second languages that we can learn (via imitation) when we already speak. Clarifying the more primary cultural sense in which Kanzi has language – emphasizing his Pan/Homo *life* and not the mechanism of imitative learning of demarcated skills – is therefore our most urgent task. If the reader wants to question that Kanzi has language even after studying our description of his behaviour, then he or she is free to do so, since our primary aim is conceptual clarification. Hopefully, such a reader will be aware of the *specific* sense in which he or she chooses to use the term 'language,' and thereby able to deny that Kanzi has language without denying that the phenomena we describe below can appear in animals, and developed in Kanzi. Such a reader will gain a better understanding of what we mean by talking about 'Kanzi's language', and see the significance of such a concept of language, not least in biology. An analogy explains the point. An exacting music teacher may want to deny that a singing child produces true music because what the child sings is out of tune and lacks a steady beat, and that is all right as long as her specific demands as music teacher do not prevent her from seeing the facts (for example, that the child is singing) and their relevance for our understanding of music as an expression of human nature. But when she sees the facts and their significance, she may no longer want to deny that the child is making music. The specific sense in which she previously wanted to deny that the child was

making music – which might be reasonable within her profession – no longer strikes her as being of overriding importance.[17] By overemphasizing the validity of her professional human occupation, her first judgement about the musicality of very young children was anthropocentric in a sense that will be clarified in Chapter 3.

We do not reject Hockett's set of design features, but see them in a more comprehensive cultural perspective on linguistic phenomena. By focusing on common dimensions in the acquisition of language in humans and bonobos, we believe we clarify notions of language that are more qualified for tracing a linguistic continuity among the primates. In contrast to Hockett's catalogue, however, our design features are not meant as criteria that can be used routinely in the field to decide whether some bit of animal behaviour is language. Our catalogue is philosophical and meant to promote better thinking about the nature of language, and better understanding of what it would mean to look for precursors of language among the animals. This is our catalogue of design features of language in its cultural dimensions.

Spontaneity

That Kanzi acquired language spontaneously is what most clearly distinguishes him from other apes to whom researchers tried to teach language. To the extent that we taught Kanzi details concerning the use of lexigrams, we relied on language that developed naturally in the context of daily life activities. If language is recognized in its cultural dimensions, it is not surprising that first-language acquisition is spontaneous. It is difficult to imagine how Kanzi could acquire the lexigram LOOKOUT POINT as the name of a location in the forest except in the context of a life that engaged him, and in which reaching this location during continuous social interaction played vital roles for him. Going to Lookout Point with Kanzi developed into saying we were going there while doing it, which resulted in discussing going to Lookout Point *or* Hill Top, which developed into asking Kanzi where to go and his response of pointing to the lexigram for the location he wanted to go to. Kanzi protested if his choice was neglected, but the protest was, of course, spontaneous and nothing we taught him in an attempt to teach him how to make choices! Had we taught Kanzi every detail characterizing human language use (which is impossible), it would be doubtful if his utterances were linguistic, and not rather mechanical or some kind of trick. This is related to observations made by Rush Rhees, a philosopher who emphasized the connection between language and culture.

Instead of categorically denying that animals can learn to speak, he said that if they learn to speak, they will not learn it as they learn tricks.[18] Language use is essentially spontaneous. Using food as reward inhibits, rather than stimulates, apes' acquisition and use of language.

Human children acquire and use their primal language spontaneously, but learn foreign languages as a conscious effort. A university student who speaks a foreign language excellently may thereby reveal that she has been 'practising her Spanish'. Young children who simply talk with each other while playing, however, are typically not said to reveal that they have been 'practising their language.' A child who nags her brother could perhaps be said to be practising her argumentation skills, but argumentation takes place in language acquired spontaneously without training in the process of maturing as a member of human culture. There is no such thing as 'feeling so proud my two-year-old daughter practises language so ambitiously,' but that feeling is not absurd when a teenager takes her foreign language studies seriously. A student may find French boring and avoid those classes, but can a three-year-old girl have the attitude that 'language is boring' and avoid it? She may for various reasons avoid talking much, but can such a reason be that she finds language tedious? Moreover, while we consider fluency in foreign languages a sign of intelligence, we do not consider a child intelligent simply because he or she speaks. It makes clear sense to say, 'Mr. Wilson taught me to read and write', or 'my cousin taught me to speak French'. But if someone joined the discussion and said, 'my parents taught me to speak,' we would perhaps assume that the parents taught their child to speak *well*, for instance, before an audience; but such a child already speaks. We agree with Noam Chomsky (1996: 563), it does not make sense to speak of children as *learning* language, at least not if this means training in the behaviourist sense, and language development is to a great extent a process of maturation. However, we interpret these facts culturally rather than grammatically. We see language acquisition as a form of enculturation, as a metamorphosis brought about by the broad variety of stimuli that human culture exerts on socially sensitive and still immature infants. When young apes are treated as self-evident members of this culture, or a variant of it, they too develop language without explicit teaching and beyond our conscious control. Language is not innate, as Chomsky believes, and yet it is not learned, as many cultural psychologists assume. As the philosopher Stanley Cavell remarks, 'there is not the *clear* difference between learning and maturation that we sometimes suppose there is' (Cavell 1979: 171).

We tend to underestimate the extent to which everyday life attracts the attention of the young ones and changes them. Sometimes even parents ask themselves, 'Why does my daughter react to my words when I forbid her to touch the vase, when I have never punished her?' We reason as though a child's life would not develop if we did not constantly run around with a stick and a carrot pushing the child forward in directions we control. We forget that life engages children in ways we cannot foresee, and we often exaggerate the importance of pedagogic techniques. Not even parents who use punishment and reward can do so always: on the most basic level of action and life, even the parent is spontaneous. There is an ocean of human ways of being that children develop only on this inevitably spontaneous level of interaction with adults:

> To say we are teaching them language obscures both how different what they learn may be from anything we think we are teaching, or mean to be teaching; and how vastly more they learn than the thing we should say we had 'taught'. (Cavell 1979: 171)

When it comes to animals, our tendency to underestimate how the cultural environment attracts their attention and transforms their ways of life is even greater. We are more impatient with animals than with children. We are less inclined to wait trustfully that the animal will mature and be transformed in four years' time, just by being initiated into a new environment and allowed to act there. The tendency to use reward and punishment is far greater when we try to shape an animal, especially in research projects that have to deliver results in short time according to controlled and reportable procedures. But most pet owners who develop a close relation with their animals come to know that even if food is important, animal life is more multidimensional and shaped not by consciously decided food rewards alone. The widespread idea that animal life only is about satisfying the need to eat is not a scientific fact, but projects one of our human vices on nature: 'To have to think incessantly of bread in fact runs counter to the world of living things and is a concern only for humans who have become estranged from this world' (Imanishi 2002: 81). (See also MacIntyre 1999 and Gaita 2003 for two philosophers' attempts to remind us of the easily neglected forms of animal life.)

Savage-Rumbaugh's sister and colleague Elizabeth Pugh, who initiated the apes into many new aspects of language by exploiting how the moment attracts their attention, describes to us how laborious her work

was before the discovery of young Kanzi's language. In those times she used the simple mechanics of reinforcement, and she explains how deciding when to give the ape a food reward soon became so complicated that she felt that food became a problem in her interactions with the apes, rather than a means of developing them. Food tended to come in the way, and it made the ape's attention to the situation one-dimensional. It was a relief to leave this dull and laborious method behind and raise apes as children are raised, and talk about whatever it was that for the moment attracted their attention. Instead of using food as a reward, it became a way of making social life more pleasurable. This opened the gates of life. When the bonobos got the opportunity to develop their interests and inclinations in an environment that responded sensitively to *their* responses, the process of learning new forms of language no longer had to be fuelled or pushed forward: 'learning tends to be much more comprehensive than suggested by the traditional stimulus–response framework' (Rumbaugh and Washburn 2003: 234). Experiencing this self-supporting process has been akin to witnessing a force of nature, since we did not have to control it behaviouristically in the traditional sense, but could as it were stand beside and watch its effects. Let us call this the design feature of spontaneity.

Boundlessness

The second design feature of Kanzi's language is the absence of demarcation lines between his language and his life. Nim was taught the art of signing five days a week, for five to six hours, as if language were a delimited activity such as playing football, which we can practise for a couple of hours and then relax doing something else. Kanzi's acquisition of the name 'Lookout Point' could *not* be isolated from the rest of his life. We were never in a position to say, 'At ten o'clock we were still working hard in the lab practising lexigram symbols, but after an hour it was time to relax, so we took a walk with Kanzi to Lookout Point.' We could not speak thus of Kanzi's language acquisition, because the most important part of learning the symbol consisted in travelling in the forest. Moreover, no one could foresee in which situation the lexigram symbol could be relevant, or in what way it might be used. Perhaps Kanzi used the symbol in the morning to express his wish to go to Lookout Point after lunch, perhaps he used it during a walk as an answer to, 'Where do you want to go?,' perhaps he used it to express that he had been there before, or that his ball was there, or that he could see the location through the branches, or perhaps we used it to tell Kanzi

that we had placed a food surprise at Lookout Point. One single lexigram could reach into each and every situation of Kanzi's life in unforeseeable ways. But he understands at least 1,000 words and uses about 250 lexigrams on the keyboard. Their multifarious uses crisscross Pan/Homo life in ways we cannot even dream to survey, and could not have taught him according to a preconceived plan. However, when we tested Kanzi's language, the carefully planned tests were demarcated and could be surveyed, and we often needed to relax afterwards. But then testing had, as remarked above, more in common with second-language learning than with first-language acquisition.

The parallel to human language acquisition is easily established. About a teenager leaning over her books, we may typically say, 'She has been studying Spanish for an hour now, but soon she'll need to go out with her friends.' It is unclear, however, what it would mean to point to a two-year-old child and say, 'She has been practising language for an hour, but soon she needs to go out and relax.' In the above examples, there is no demarcation line between the child's language and her play, but there is an all-too-clear line between the teenager's foreign language studies and her going out with her friends.

The indissoluble connection between our primal language and our life; that is, the absence of demarcation lines between what we say and what we do, permeates each and every one of our human utterances. It is not uncommon in linguistics, however, to see autonomous syntax as the essence of language. Derek Bickerton (1995), for instance, presents it as a core feature of language that the sentence 'Mary knows Bill' can be expanded syntactically into 'I wonder whether Joe admits that Sue believes that John thinks that Mary knows Bill.' To what extent does this expansion illustrate how our natural language works, and to what extent does it illustrate how an invented syntactic calculus works? It is a fact that practically all of these syntactic expansions are meaningless and cannot be exemplified in the real-life use of language. How can the infinite possibility of constructing new sentences, if it is essential to language, lie fallow, since we never speak that way to each other? Is it because we have limited access to our own language? Is it because performance is more limited than competence? The design feature of boundlessness provides a simpler explanation. The notion of limited access to our own language is a chimera that arises when we over-generalize the rules of an invented formal calculus. Our ordinary language use is not more limited or simple than this invented syntactic calculus is. It is more complicated and more adventurous, because it is grown together with life itself. Consider how varied and inseparable from the situation it is to say such a

simple thing as, 'Let's take a walk in the forest.' Consider such a thing said in conversation between two persons who are:

(i) lazily spending the whole morning at the kitchen table, looking out through a window that faces a beautiful forest bathing in sunlight;
(ii) sitting by the same window, playing a computer game featuring a forest into which they can lead their heroes;
(iii) playing the same computer game, but now tired of it and sometimes glancing out through the window;
(iv) sitting by the same window, planning what to do tomorrow during a trip by car to a distant lake surrounded by a large forest;
(v) taking their planned walk in the distant forest, discussing what to do when they return home;
(vi) taking their planned walk in the distant forest, discussing what to do when they return home and start the computer.

Try to remember what it is like to be in these situations, and how uttering the words and understanding them means subtle interplay with flows of daily events (the sunlight illuminating the forest), or of actions (turning on the computer), or of emotions (yawning and hearing the other person sigh). Uttering the words and understanding them *is* interplay with the characteristic situations in which human beings find themselves. Language *is* this interplay. It is not because of any human limitations that we do not understand the syntactic extensions of sentences that can be generated with paper and pencil according to syntactic rules, but because these extensions are out of touch with language, with the kinds of situations in which human beings are when they talk and understand each other. The syntactic extensions are breaches of the *cultural* 'principles and parameters' of language. They are not genuine expressions of language, but formulas of an invented calculus (see Stenlund 1990). The limitation is the *applicability* of this syntactic calculus to our already existing language.

The interplay of words with situation lies so far beyond intellectual control that the only way to foster language in young Kanzi was by avoiding formal language training and instead using words boundlessly, in spontaneous interaction with each other and with the situations that occur at the research centre. Kanzi acquired 'Lookout Point' in endless variations of saying, 'We'll go to Lookout Point when Sue returns,' and similar things. He learned the name as synonymous with multifarious interplay with the Pan/Homo world.

With the exception of integrational linguists such as Roy Harris (1981), linguists generally do not emphasize boundlessness as an essential feature of language (which is natural since they typically study circumscribed *languages*). It is easier to find illuminating accounts of this feature of language among philosophers, perhaps partly because they are not under a professional obligation to apply specialized linguistic perspectives to language.[19] Ludwig Wittgenstein (1953) discusses numerous examples of how human language is intrinsically connected with human ways of life; Charles Travis (1989) uses the term 'occasion-sensitivity' for basically the same feature of language;[20] and Sören Stenlund asks,

> What would it be like to give a *complete* account of the conditions for the correct use of the expression 'Good morning!' . . . to someone who is not familiar as a human with these human conditions? It is clear that the familiarity with conditions like these is part of our language. Without it, language is lost. (Stenlund 1990: 82–3)

The design features of spontaneity and boundlessness have relevance for Michael Tomasello's (1999) theory that although cultural innovations may appear among nonhuman primates, they will eventually vanish because apes, according to him, do not actively seek to transfer innovations to new generations, and above all do not learn through imitation. This theory exaggerates, we believe, the consciously controllable contents of culture, and neglects how profoundly an immature child's *life* is transformed when language develops. Considering how young Kanzi, by acquiring language spontaneously and boundlessly, became a different living being from other bonobos – an intermediary Pan/Homo being – language cannot be understood as a delimited cultural innovation that is intentionally transferred to new generations, or as a set of skills that children can imitate according to a means/goal scheme. It is unclear what it would mean to acquire language the way Boesch and Tomasello assume it is done:

> Language and possibly some cultural conventions are clearly learned through imitative learning in humans. (Boesch and Tomasello 1998: 601)

Although imitation often occurs when children begin to speak, the generalized idea that language acquisition *is* imitative learning has more in common with Terrace's attempts to teach Nim a demarcated vocabulary

of hand gestures (hoping he would later combine them grammatically) than with how profoundly Kanzi, Panbanisha and all humans were transformed when they began to speak in a culture that emerged with their language. This or that linguistic detail can be imitated, or even actively transferred, and Kanzi sometimes acts as language teacher, but language in general is created afresh in immature primates by sharing daily life with them and thereby sharing language. To simply speak, as we humans do, and then turn towards an infant and ask her to imitate us – 'do this!' – would often be a joke. In many cases, not even the parents would know what they would be asking the child to do. Which are the goals and which are the means when humans talk with each other? Sometimes there is an answer to this question, but it is important to remember that the question often is inappropriate. (Tomasello's notions of imitation and language acquisition are discussed in Chapters 3 and 4.)

Delimited skills such as mental arithmetic, grammar or needlework may vanish if we do not teach these innovations to new generations, but first-language acquisition is not threatened by such pedagogic neglect. The government does not have to spend money to stimulate children to start speaking. This helps us understand why Wittgenstein (1953) presented the notion of language-games as an analogy that should not be taken literally.[21] Language-games have the value of providing us with glimpses of language in cultural rather than grammatical dimensions. But since language-games, as Wittgenstein used them, are demarcated activities that can be invented and surveyed, and in which children are supposed to be trained to participate, they merely function as analogies.

The design features of spontaneity and boundlessness make the distinction between biology and culture less distinct than it usually is taken to be. To say that language is an aspect of human culture is not to say that language is a humanly controlled cultural artefact, as opposed to a biological trait (which Bickerton (1995) takes for granted it would be). Language can be cultural and yet be an aspect of our 'nature' that we control almost as little as we control our metabolism (although the sense in which we do not control language is different from the sense in which we do not control our metabolism: neuroscience cannot decide what our utterances mean). The most immediate and prosaic aspects of human life – how we move, gesture, act and talk – children develop before school. These self-evident and therefore often unnoticed aspects of culture resemble an ocean on which more conspicuous innovations such as mathematics, music and poetry sail as ships that are to

some extent under our human control. The invention of the artificial language Esperanto, for instance, was merely the invention of a new vocabulary and grammar, and did not affect the more primordial cultural framework in which this specific language would function as a language and that its inventor had to presuppose. Even people speaking Esperanto greet each other in the morning, count strawberries and discuss tomorrow's weather. There already was an ocean of human life on which to send out this specially manufactured vessel. The fact that we do not teach children each and every detail concerning language is not only consistent with a notion of language as an aspect of culture; it is even one of the most outstanding features of language in its cultural dimensions.

Language as a cultural phenomenon thus has properties that we commonly associate with biological phenomena and we believe that Chomsky was misled by this deceptive similarity in his argumentation for the innate faculty of language. Now we can show that the most immediate aspects of language are as fundamental as our own biology and at the same time aspects of culture. Culture is not an artefact. But it is tremendously difficult, and perhaps even impossible, to survey the most basic aspects of culture, those apparent trivialities of human life that young children acquire with their first language:

> In 'learning language' you learn not merely what the names of things are, but what a name is; not merely what the form of expression is for expressing a wish, but what expressing a wish is; not merely what the word for 'father' is, but what a father is; not merely what the word for 'love' is, but what love is. In learning language, you do not merely learn the pronunciation of sounds, and their grammatical orders, but the 'forms of life' which make those sounds the words they are, do what they do – e.g. name, call, point, express a wish or affection, indicate a choice or an aversion, etc. (Cavell 1979: 177–8)

Stanley Cavell's point is that 'learning language' is not merely 'learning *a* language,' as when we study foreign languages; it is acquiring the forms of life in which words function as words do. Nim was not given the opportunity to become a being who knew all these things associated with language. What he could do with signs was therefore more limited than Kanzi's language use. Language is indistinguishable from the culture we develop during childhood. Let us call this the design feature of boundlessness.

Immanence

That Kanzi acquired language spontaneously and boundlessly means that everything we do with him and the other enculturated bonobos is permeated with language. If language cannot be demarcated from ordinary life situations, but is acquired boundlessly, then it cannot be activated only occasionally. One might therefore say that Kanzi's everyday life is immanent or inherent in the language he shares with human caregivers and other enculturated apes. His actions have the imprint of language. Interacting linguistically with the bonobos is not an exclusive research concern, but the way every caregiver provides the apes with food, puts them to bed, or takes them out into the group room. Language changed the bonobos' entire everyday life. Even the most trivial everyday affairs are negotiated in language. Caregivers continually ask Kanzi what he wants to eat or do, they inform him what is about to happen, they ask him for help to collect and return bowls and toothbrushes, and if occasionally a caregiver tries to organize these matters without coordinating linguistically with Kanzi or Panbanisha, she soon has to deal with a group of very obstinate bonobos.

That Kanzi lives in a world permeated with language is visible in his physiognomy. He underwent a cultural metamorphosis in a human direction, and this affected his body. When you see Kanzi's face when he watches an object or a person, you sense in his gaze that he can engage that person in a conversation about the object and that such talk is commonplace in his life. This tangible transformation of Kanzi's body reminds us that we too are a primate species and that our most primal culture is not artificial or ethereal but has biological significance. The way his eyes meet your eyes, the way he glances at other persons or cultural objects, the way he gestures towards you or manipulates objects with his hands: everything bears witness to his language. Even when he is not using lexigrams or responding to speech, years of linguistic interaction have been deposited in the slightest glance and movement.

Our controlled tests of Kanzi's language are mediated by his primal language. It is generally pointless to carry out a test if one has not first asked him if he wants to participate, and he has approved by nodding or vocalizing '*eee*'. Disapproval is expressed by not responding to the question. If Kanzi has not given his approval, then he will not cooperate. This immanence of testing activities in the primal language is visible in the LRC and NHK documentaries. If the filmed tests are studied care-

fully, while bracketing the grammatical notion of language that governed the test arrangement, it is easy to notice that the tests are embedded in constantly ongoing conversations. This is not surprising. If apes possess language, then obviously you talk with them in order to carry out a test at all, just as you would do with a human child! Not only did we negotiate Kanzi's participation in the filmed tests, we showed him where the people sat whose voices he heard in his headphones, we described the tasks for him, encouraged him and reminded him of rules that had to be obeyed while doing the tests. When in one instance he turns around to give Sue a picture in a word comprehension task, for example, she becomes visible to him and might unintentionally cue him (see the filmed NHK documentary *Kanzi I*). She therefore says, 'Can you turn back around': Kanzi immediately turns around and awaits the next task. It happens so naturally that one scarcely notices it. The apes also have various ways of indicating that they think it is time to stop the test. Panbanisha might, for instance, approach the cameraman and tell him on the keyboard that she wants to groom the experimenter.

That the tests are mediated by Kanzi's primal language is essential to the question of whether he has language or not. If the schematic test activities were not mediated by more comprehensive language, they would be islands of peculiar abilities that merely resembled human language. They would be demarcated tricks. If one cannot talk freely with the ape before, during and after the test, the ape cannot be said to have language, no matter how impressive the test results are. Wittgenstein's (1953: 6) suggestion that we consider single language-games as complete languages must therefore be seen as part of his strategy of presenting language-games as intentionally simplified analogies to our actual language.[22]

When experimental psychologists test cognitive skills in apes who have not acquired human language, the apes have to discover the task through trial and error, since the researchers cannot tell them what to do. If the apes accidentally discover what the experimenters want them to do, they immediately obtain food. Their ability to solve the same or related tasks can thereafter be tested more systematically. Kanzi's and Panbanisha's tests, however, are mediated by language. We describe new tasks for them and often they succeed immediately. (We sometimes buy computer games in toyshops and bring them to the apes, who often understand what to do simply by listening to the computer voice; see NHK documentary *Kanzi II*.) One reason why Kanzi and Panbanisha succeed so much better than other apes in psychological tests is the design feature of immanence: the test situation becomes meaningful for

them in continuous conversation. This resembles how we constantly talk with children when we take them to the doctor. Conversation makes it easier to carry out the tests *together* with the apes: we achieve a common understanding of the task. Such a meaningful psychological test is filmed in *Kanzi II*, where Panbanisha shows that she understands that a person's beliefs may differ from how things in fact are. Panbanisha and Sue cooperatively fool Sue's sister Liz. The three of them first place a packet of M&Ms in a plastic box. Liz then walks out of the room. Sue immediately whispers to Panbanisha that they will fool Liz. She asks Panbanisha to get her some pine-needles. Panbanisha brings pine-needles and Sue places them in the box instead of the M&Ms. When Liz returns and starts opening the box, Panbanisha finds the situation so embarrassing that she pulls a blanket over herself. When asked what Liz wants, she points to the M&M lexigram on her keyboard, thus manifesting her understanding of the difference between Liz's beliefs and the actual content of the box.

When similar so-called 'theory of mind' tests are carried out on apes without language, the apes tend to function as bystanders who do not necessarily see the point of the experimenters' actions before their cages. These tests are not carried out together with the apes, but the experimenters expose the apes to a situation. Suppose three humans suddenly appear: the first starts hiding food, the second watches the first, and the third human just stands there with a bucket on her head. What can the apes possibly make of such a scene? When the first person leaves, the apes pass the tests if they prompt the second person, rather than one with a bucket on her head, to give them the hidden food, since only this person saw where the food was hidden. But if they do not pass the test, what conclusions can we possibly draw, since the point of the spectacle hardly is self-evident? Experimenters generally know where food is, so why should a bucket on an experimenter's head prevent her from being someone who can bring the food? Panbanisha's ability to interact linguistically, however, makes her an understanding participant in the test. The test is carried out in cooperation with her, which also makes it easier to interpret the test results. It is not a situation to which we expose her. The fact that she passes the test is expected, it makes clear sense to us, since it would be strange if she could (reluctantly) participate in fooling her friend Liz, but then not understand that Liz wants something other than the pine-needles in the box. Panbanisha's ability to act as an understanding participant draws on her unique life. We often eat with the apes, we discuss with them what kinds of food we should bring out into the forest in our cool bags and we pack the bags

together. The test activity just described is a member of this family of Pan/Homo activities. Panbanisha's comprehension of the situation draws on her culture, on her first language, by which the filmed test is mediated. When we test what the apes can understand or do, then, both bonobos and humans act in an intermediary Pan/Homo world. This cultural transparency is normally absent in laboratory studies of primate cognition, for the experimenter tends to act in another culture than the animal does, and sometimes even to idealize this cultural distance to the animal as 'objectivity'. Although important conclusions can be drawn from such experiments, it is evident that an intermediary bi-species culture, such as the Pan/Homo culture, will reveal cognitive potentials in great apes that otherwise would remain hidden.

The design feature of immanence makes proving language in enculturated apes almost surrealistic. In a film by surrealist Luis Buñuel, two parents go to the police station to report the disappearance of their daughter. The policeman needs a description of the girl, but fortunately the parents brought the little girl. This satisfies the policeman, since the girl's presence simplifies the search for her; she can even answer one or two of the policeman's standard questions. Trying to prove that an ape has language, when you constantly talk with her in order to organize the proof, is not much less comical. And what is more, our conversations with Kanzi and Panbanisha, while conducting the tests, are more complex than the tests themselves. By trying to prove that the enculturated bonobos have what in actual fact would be merely a second language (vocabulary and grammar), we neglected their true language, as we believe many ape language sceptics do who discuss the tests without paying attention to the language in which the tests are embedded. If ape language critics, such as Herb Terrace, Joel Wallman or Steven Pinker, pay attention to what goes on around the test subject, it is for the purpose of detecting non-linguistic cueing. The possibility that what goes on around the ape while the test is conducted is the ape's *real* language has not occurred to them, since their notion of language corresponds to the focus in the test on the ape's formal tasks.[23]

Parents experience immanence in language when the child starts comprehending and using words. Life with children is profoundly changed when we begin coordinating situations by interacting linguistically with them. A walk in the city is different when we can shout, 'Stop! . . . *now* cross the street', and no longer have to stop them physically. One might even be inclined to think that it was immanence in language that René Descartes intended when he described reason as a 'universal instrument' enabling us to 'act in all the occurrences of life'![24]

The philosopher's description of reason as universal instrument has certain similarities to our experience of language, both as parents and as caregivers sharing life with enculturated children and apes. Immanence characterizes our first language, but not our second languages. Humans may transcend English by speaking French instead, but they do not thereby transcend their primal language. The life humans live with words, the cultural matrix of languages, is more or less the same form of life, regardless of which specific language they speak. Viewers of the NHK documentaries who see the imprint of this common human way of life in Kanzi's physiognomy, but have not yet recognized it as language, sometimes react by saying that Kanzi strikes them as intuitive and that he appears to know what goes on around him, that the human world appears transparent to him. If we had to use Descartes' vocabulary to describe the effects of Kanzi's enculturation on his physiognomy, gaze, gestures and movements, we might say that he looks like a creature with the faculty of reason. The point is not that enculturation took Kanzi over some hard and categorical line separating us from the animals. The point is that we have not yet learned to recognize language and reason as integral with our mundane ways of life. Human reason is not the separate and abstract 'faculty' that we tend to imagine that it is. Kanzi's intermediary existence as a Pan/Homo being helps us see continuity between the animals and us. He makes it evident that our primal language is a more palpable aspect of human life than is vocabulary, grammar or logic: 'Commanding, questioning, recounting, chatting, are as much a part of our natural history as walking, eating, drinking, playing' (Wittgenstein 1953: 25).

Cultural creativity and generality

Herb Terrace's goal was to produce an ape who could sign creatively and thereby express whatever came to mind. Because he perceived language as if it were a second language, he identified creativity with the ability to construct sentences according to grammatical rules: 'the essence of human language lies in the ability to create sentences' (Terrace 1979: 168). One feature that clearly distinguishes Kanzi from Nim is that Kanzi readily comprehends creative language use by humans, and uses lexigrams in the same creative manner when speaking to us. We believe that we were more successful because we allowed Kanzi's *acquisition* of language to have the same flexible and improvising character as the *effect* that Terrace hoped grammatical rules with a formal generality would have on Nim's behaviour.

Language-trained apes use artificial symbols in a mechanical fashion, rapidly and according to static patterns. Language is reduced to a grammatical steeplechase course towards obtaining food. Even though the apes enjoy the challenge of the task, it is difficult to recognize the characteristic pace and expressive rhythmic variations of human language in the often tense and one-dimensional movements they produce. The simple fact of the matter is that they are running a racetrack to earn a gratification – that is what they are invited to do – rather than trying to communicate freely with a fellow creature.

Kanzi uses the keyboard in a strikingly thoughtful manner and self-willed Panbanisha often communicates while lying down. Lazily she reaches out for the keyboard, pulls it towards her and slowly searches for the symbols that express what she wants to say. Language use at the LRC is not a mechanical solo performance towards obtaining food and then eating it alone. Language is socially as meaningful as eating together, and we improvise our linguistic interactions just as we improvise our eating. A new way of using a lexigram comes just as naturally as a new way of eating something, or a new way of preparing food. When Pär Segerdahl visited the LRC the first time, he and Bill Fields hid a food surprise in the trailer where Pär stayed during his visit. Bill told Kanzi about the surprise and said that they would get it for him a little later. About an hour later, Pär sits outside Kanzi's enclosure while Kanzi interacts with Clara, one of the LRC caregivers. Kanzi asks for the surprise, but Clara tells Kanzi that Bill is not there and that he will get the surprise when Bill returns. Kanzi then points to the symbol PEAR. He rarely asks for pears, and if he does so, he normally knows someone bought pears. There were no pears at the centre that day and had not been for quite a while. The word 'pear' sounds exactly as 'Pär' when pronounced by Americans. Kanzi continued to point to the PEAR lexigram, even after Pär returned to Sweden. To check what Kanzi actually meant, Savage-Rumbaugh asked if he wanted pears to eat, to which he did not respond. Then she asked if he wanted Pär the person, to which he responded with loud vocalizations. It seems clear that Kanzi used PEAR to say something that had to do with Pär. Pär's reaction was that Kanzi suggested that he would go to the trailer and fetch the surprise. If this was Kanzi's meaning, which is a reasonable interpretation, it came as naturally for him as throwing a pear and using it as a ball, or pretend feeding a doll with the pear instead of eating it himself: creative things Kanzi easily might do, although they concern the fruit instead of the lexigram. There is nothing peculiar about linguistic creativity, as compared with other kinds of creativity, once we perceive language in

cultural rather than grammatical dimensions. To express new ideas eloquently requires, of course, the mastery of a powerful and flexible linguistic medium, which the keyboard is not. But Kanzi's ability to transgress the limits of the keyboard and use PEAR creatively shows that linguistic creativity is not a formal property of the medium, although properties of the medium are vital and cannot be disregarded. Kanzi utilized the entire Pan/Homo situation that emerged that day, and the coincidence that the word 'pear' sounds like the name Pär. He used this material to improvise. We do not need to start up slumbering syntactic mechanisms in order to make an ape act creatively. It is just the other way around. Successful language acquisition develops a cultural creativity that apes possess in their capacity as social primates (see King 2004). Linguistic creativity is a variant of the creativity of the primate way of life.

Someone may wish to object: 'But creating a sentence surely is categorically different from using one single symbol in a new way!' It seems that very often when a categorical distinction enters our thinking about language, the appearance of the dichotomy has to do with our conceiving of language as if it were a catalogued second language. Yes, there is a categorical distinction between vocabulary and grammar in the second-language conception of language. Words are simple elements, the atoms of language, while sentences are hierarchically organized combinations of such elements. In the real-life use of language, however, the distinction between simple words and complex sentences is not so easily upheld. Consider Wittgenstein's (1953: 19–20) discussion of what has been called the builders' language-game, or language-game No. 2, as it is described in paragraph two of *Philosophical Investigations*:

> Suppose that a builder shouts to his assistant,
> '*Slab*!'
> Is what he shouts a shortening of the following sentence?
> 'Assistant, bring me a slab.'

Observe that the builder's *slab*! cannot be identified with the word 'slab' as it occurs in the longer sentence just formulated, for the shouted *slab*! is not simply the name of a prefabricated unit, rather it is a complete order. But why not call the shouted word a sentence, then, and conceive of 'Assistant, bring me a slab', as a *lengthening* of the sentence? The logician Willard Van Orman Quine (1960) is famous for his discussion of the one-word sentence 'Gavagai!' Grammar forbids such use of the

term 'sentence,' but perhaps grammar conceals more than it reveals when we are dealing with our primal language, with the uses of words in cultural dimensions. We certainly do express complex meanings by saying things like '*slab*!', '*here*!' or '*perfect*!'

> The sentence [*slab*!] is 'elliptical,' not because it leaves out something that we think when we utter it, but because it is shortened – in comparison with a particular paradigm of our grammar. (Wittgenstein 1953: 20)

The paradigm of grammar, or of writing, if it is exaggerated to an intellectual dogma about language in general, has far-reaching consequences for how we analyse linguistic phenomena. It forces us to claim that the shouted '*slab*!' and the word 'slab' in the long sentence are the same name of a prefabricated unit, and that shouting '*slab*!' leaves out aspects of what the builder thinks while shouting it (perhaps unconsciously): aspects that are expressed linguistically only by the long sentence. The paradigm of grammar, if taken for the essence of language, forces us to distinguish between language and language use, or between semantics and pragmatics (Morris 1938; Levinson 1983; Bickerton 1995). These distinctions can be questioned on philosophical grounds (Segerdahl 1996), but Kanzi's acquisition and use of language provides further support from primatology for rejecting a grammatical conception of language as it is originally acquired and used. When Kanzi pointed to the symbol PEAR, Pär understood him as asking if Pär could go to the trailer and get Kanzi his food surprise. Within the cultural activity in which Kanzi, Clara, Pär and Bill participated, Kanzi's utterance functioned as a subtly composed novel sentence. But we can just as well say that it functioned as a novel word, for in the primal language, the distinction between 'words' and 'sentences' is not categorical. Both terms denote *what is said* in situations of daily life. Kanzi used PEAR as a novel word, to *ask* if a certain person could get him his food surprise.

First-language creativity, then, cannot be identified with 'constructing sentences' as opposed to 'uttering simple words,' and Kanzi's novel utterances draw on cultural rather than grammatical sensibilities (the latter sensibilities presuppose literacy). Regardless of whether he uses one lexigram or combines several, he regularly expresses novel things, and in doing so, he utilizes the Pan/Homo situations in which he and his interlocutor are acting, as well as the entire culture in which they live. This is not surprising, for sensibility to grammatical form has more to do with erudite standards of constructing inventions called 'full sen-

tences' with paper and pencil. But let us look more closely at what, from a grammatical point of view, would be classified as novel sentences. Kanzi's comprehension of novel sentences in controlled test situations is documented in detail in Savage-Rumbaugh et al. (1993), in the LRC documentary, *Bonobo People*, and in the NHK documentaries. As remarked before, however, we believe these controlled tests merely reveal the tip of an iceberg. They do not give us a fair picture of Kanzi's actual language. What we want to discuss now is a scene in *Bonobo People* where Kanzi fails to understand. As the Titanic, he crashes against the iceberg previously invisible in the test, but that also functioned as the groundwork on which he acted. Savage-Rumbaugh wears a welder's mask and utters the following novel sentences, to which Kanzi responds appropriately:

Kanzi, could you cut the onions with your knife?
Can you put some soap on your ball?
Kanzi, can you put the pine-needles in the refrigerator?
Kanzi, are you listening, can you put some soap in the water?
Could you pour some coke in the water?
Kanzi, pour the Perrier water in the jelly
Could you carry the television outdoors, please?
Kanzi, can you get the pine-needles that are in the refrigerator?
Can you pour some Perrier water on the doggie?
Can you put your shirt in the refrigerator?
Go get the cheese out of the microwave
Could you put the raisins in the cheese?

The test runs smoothly, one can almost hear the sound of syntactic cogwheels spinning inside Kanzi's head. But then suddenly Kanzi fails to understand. He fails to understand the simplest of sentences:

Kanzi, could you open the soap?

The individual words are familiar to Kanzi, and although the sentence is novel, the syntactic rules required for describing its structure are not. If we perceive language as a general grammatical mechanism applicable to all novel sentences, we might think that since this mechanism made sense of the sentences above, then it ought to make sense of 'open the soap' too. When Kanzi fails to understand, it is tempting to think that the mechanism jammed. He got tired. However, if Kanzi's ability to participate in the test is shaped by the manner in which he acquired lan-

guage, there is a simpler explanation of his failure to understand. Kanzi is engaged in a cultural activity, and how he perceives words cannot be abstracted from this and other characteristic Pan/Homo activities. How the word 'soap' functions in the test is connected with how the soap itself functions. The function of the soap, in this particular test, happens to be that of an indivisible whole. Kanzi is asked to pour liquid soap on objects: the soap is used as an instrument. If he hears the request to 'open the soap' merely according to this pattern, perhaps because he is tired, then the request might be as incomprehensible for him as the idea of 'opening the knife'.

The filmed test activity is, of course, not the only activity in which Kanzi encounters uses of the soap and its name in perfect union. That is why Savage-Rumbaugh can ask Kanzi to open the soap and expect that he will understand. Given the unbound manner in which Kanzi acquired language, Kanzi might have understood 'open the soap' as intended if he had perceived the utterance on the basis of *other* familiar activities, where the soap indeed is divisible. As we remarked in Chapter 1: 16–20, the standardized test activities are parasitic on unbound linguistic interactions, often in the forest surrounding the laboratory, but also in the buildings where the apes spend much of their time, for instance, the kitchen. Opening screw caps and lids are familiar activities for Kanzi. That Kanzi did not understand Sue's request might therefore very well have been because he was tired. It is common also in human language perception that we fail to understand because we are too drowsy to change perspective, and it takes some time before we can exclaim, 'aha, you meant I should open the door wide, I assumed I should just unlock it'. Such interference between cultural possibilities for a single utterance is visible earlier in the filmed test, before Savage-Rumbaugh puts on the welder's mask. She asks Kanzi to 'take the vacuum cleaner outdoors'. Kanzi actually starts pulling the machine, but then he hesitates and touches the ball instead, as if asking if it would not be more reasonable to take the ball outdoors. Maybe Sue's face made Kanzi listen to her utterance from the point of view of more natural activities than the somewhat artificial test practice governed by the desire to present Kanzi with 'novel sentences'. Savage-Rumbaugh concludes today that what she should have said to Kanzi, to make him understand, was 'could you open the soap bottle'. That would have been a more sensitive way of playing on his Pan/Homo life. She further comments that had she and Kanzi been out of the test situation and engaged in normal daily life, Kanzi would probably not have hesitated to unscrew the soap container if she asked him to 'open the soap'. But

equally probable would be that in a real-life situation she would have a reason for needing the soap open, and that reason would be transparent to Kanzi, thereby making his interpretation of her sentence equally transparent. This is an aspect of the design feature of boundlessness: language use is interplay with our characteristic life situations.

Once again we find ourselves in agreement with Noam Chomsky: creativity is a central feature of language. However, we interpret creativity culturally rather than grammatically. The linguistic creativity exhibited in the filmed tests, and even more in spontaneous conversations, derives from how the human and the bonobo can play sensitively on their situation and personal history in a shared and intermediary culture. Communicating new meanings is similar to co-constructed musical improvisation, which presupposes, maintains and transforms a common musical heritage. Stanley Cavell reformulates Chomsky's idea of linguistic creativity in a non-Chomskyan manner that we find congenial with our notion of cultural creativity:

> If what can be said in a language is not everywhere determined by rules, nor its understanding anywhere secured through universals, and if there are always new contexts to be met, new needs, new relationships, new objects, new perceptions to be recorded and shared, then perhaps it is as true of a master of a language as of his apprentice that though 'in a sense' we learn the meaning of words and what objects are, the learning is never over, and we keep finding new potencies in words and new ways in which objects are disclosed. The 'routes of initiation' are never closed. (Cavell 1979: 180)

Savage-Rumbaugh's request might have created such a new situation for Kanzi. But given the formal nature of the test and Kanzi's drowsiness after participating for quite some while, he failed to understand her improvised request to open the soap as intended, probably because the soap had been used in the test consistently as an indivisible whole. The request deviated from this pattern. Yet, one of the distinguishing features of Kanzi's language use, as opposed to that of language-trained apes, is his readiness to draw upon and develop *different* aspects of his cultural experience when he finds himself in new situations. This improvised creativity, the generality of Kanzi's language, is not a manifestation of hidden grammatical mechanisms with a formal generality. It is rather a manifestation of the unbound manner in which he always was allowed to use language in spontaneous conversations in new (but not

alien) situations. His language has the property of creativity because he always was free to improvise.

Acquiring language is to a great extent developing an ability to give birth to new language for new purposes in new circumstances. Children do it all the time when they find themselves in new and yet characteristic culture situations, as do entire generations of humans. Language changes as an aspect of how life more generally changes. The generality of Kanzi's language is thus dependent on his inventiveness in new Pan/Homo situations.

As a final illustration of the cultural generality that characterizes the bonobos' language, consider Panbanisha's comprehension of the word 'on.' She was asked to 'put the rubber band *on* the big lexigram,' to which she responded appropriately by dropping the rubber band on a bigger version of one of the lexigrams on her keyboard. Then she was asked to 'put the rubber band *on* the doggie' (a toy animal). In spite of the formal nature of the test, she did not drop the rubber band on the dog, but carefully put it on the dog as a collar. Chomsky's desire to have this living landscape of language produced by general mechanisms, even though he admits it is unfulfilled, oversimplifies the design feature of cultural creativity.[25]

But what about human language use? Surely, *our* understanding of novel sentences, *our* linguistic creativity, is pure and syntactic and not the cultural mess described above? Well, since every reader of this book has learned to read, write and speak at least one second language, namely, his or her mother tongue as taught in school while sitting down, every reader of this book has been drilled for years to adopt a pure grammatical stance towards language as soon as linguistic matters are brought up for discussion. It is part of our social veneer to adopt this stance in educated conversation, and we display our grammatical skills more or less as social circus tricks. If we are right, this tidy and drilled grammatical perspective conceals our primal language and what it has in common with Kanzi's language. When we learned this erudite perspective on language, we had already developed language in Kanzi's more mobile and physical sense.

Even humans occasionally crash against the sunken rocks of their primal language, and many linguists probably overemphasize our comprehension of novel sentences. If we wanted to, we could just as well concentrate on constructing novel sentences that we *fail* to understand. There is, however, a good reason why linguists who see language as innate and uniquely human prefer cases of understanding. By tacitly

taking for granted that we understand and by persistently focusing on such cases, language comprehension appears inevitable and automatic, as the result of hidden mechanisms. But failure to understand is one of our characteristic experiences of language and should not be neglected. Perhaps investigation into such cases gives us a better vantage point from which to study the conditions of language comprehension, since failure to understand forces us to stop and give the machinery an overhaul. That is Savage-Rumbaugh's reaction when Kanzi fails to understand 'open the soap'. *She takes the soap and unscrews the pump*. Her action explains the meaning of the novel sentence by demonstrating the cultural activity on which understanding draws.

It might be objected: 'But surely unscrewing the pump corresponds to what it *means* to open something. We humans don't need the activity to understand the sentence. We simply understand it. That the sentence describes the action of unscrewing the pump is a consequence of its meaning in language; of the rules for interpreting this arbitrary novel sentence.' Could not 'opening the soap' mean cutting it with a knife? Would not that be another way of being linguistically creative?

We pilot the reader towards the sunken rocks of the human primal language. Consider this sentence, invented by John R. Searle (1983) in a discussion of the notion of literal meaning:

Bill opened the mountain

It is the simplest of sentences, yet we do not understand what it says. Searle invented the sentence to argue the necessity of complementing grammar with background practices on the basis of which abstract semantic content is understood. The reason we do not understand the sentence, according to Searle (1983: 147), is that we have no common practice of opening mountains to produce an understanding of the content. The grammatical cogwheels run as smoothly as ever and determine a general semantic content of the sentence, but we lack the background practice needed to take the sentence all the way through to a real-life action. Searle's idea of complementing grammar with 'the Background of practices' has much in common with Chomsky's engineer-like attitude towards linguistic creativity. Searle assumes, for instance, that 'open' has *one* literal meaning, and that different understandings produce themselves through interactions between pure semantic content and aspects of the more messy 'Background'. He tries to combine the simplicity of the grammatical picture of language with

what we call culture, but with culture playing the subordinate role of mere background to grammar. If one looks more closely into Searle's own example, however, the cultural aspect comes to the fore.[26]

We consider three ways of opening a mountain and ask if the corresponding understandings are produced according to Searle's scheme. In the first scenario, Bill is a tunnel worker: that Bill opened the mountain means that he did the blast that made it possible to pass through the mountain. In the second scenario, Bill is a geologist: that Bill opened the mountain means that he shovelled away a thick layer of earth so that the bedrock came into the open and could be inspected. In the third scenario, Bill is a miner: that Bill opened the mountain means that he did the blast that took the miners to the metalliferous vein so that they could start bringing the ore up to the surface. Each of these scenarios can make us react, 'Yes, that's an appropriate understanding of the sentence!' According to Searle's scheme, each time we react with understanding, the same semantic content interacts with a new aspect of the 'Background'. Does this scheme withstand closer scrutiny?

Why do we find the sentence applicable to the activity of constructing a tunnel? Is it because this activity resembles some abstract semantic idea of 'opening something' in general? Is it not rather because tunnel construction resembles other activities, such as opening a door for the purpose of passing through the doorway? Why do we find the sentence applicable to the activity of shovelling away the earth layer? Is it not because shovelling away the earth layer resembles other activities, such as a surgeon's opening of a wound for the purpose of inspecting it? Why do we find the sentence applicable to the activity of mining? Is it not because mining resembles other activities, such as opening a jar for the purpose of making its contents accessible?

Our suggested possible understandings do not draw on relations between various practices and abstract linguistic content. *Understanding, rather, draws on relations between tangible practices, some of which already harbour uses of 'open'*. We may, in some situations, find blasting a tunnel similar to opening a door, or shovelling away earth similar to opening a wound, or mining similar to opening a jar. That is how we come to understand 'Bill opened the mountain' in the three ways just indicated. Searle's picture of abstract semantic content hovering above mundane life and becoming understood differently against the background of everyday activities is misleading because of its platonic dimension. The dialectic between pure language and messy life arises precisely because Searle protects a grammatical notion of language by embedding it in a 'Background of practices'.

An important effect of Wittgenstein's concept of family resemblance is that it can help us see how we arrive at our variable understanding of 'open' without hypothesizing the existence of abstract semantic content. Blasting a tunnel sometimes simply strikes us as similar to opening a door, and our seeing that resemblance does not require mediation by abstract semantic content. We replace this metaphysical picture with one where the cultural component prevails. Words are combined in cultural rather than grammatical dimensions. What we already possess when we improvise the novel utterance 'Bill opened the mountain' is a comprehensive culture where 'open' already is used in a family of related ways. 'Of course, what confuses us is the uniform appearance of words when we hear them spoken or meet them in script and print' (Wittgenstein 1953: 11). Of course, that is what gives us the impression of an autonomous language *L* looming through the real-life uses of language.

The verbal regularities that are found in all languages are not inconsequential, but their importance is that they open up for (rather than determine) culturally driven possibilities of expression in a multitude of situations, for instance, saying, 'look, those tunnel workers are opening the mountain'. A relevant regularity here is that we use the same word 'open' that can be employed in so many other situations arising in human life. But this verbal regularity – open – functions creatively because *we* draw on unforeseen relationships between activities (opening doors, wounds, jars, taps, books, and so on). The verbal regularity cooperates with the entire culture: that is how these regularities exist and function in language. The intellectual discipline of grammar standardizes some of the regularities as if they existed in their own right, in their own purely verbal dimensions. Grammar thereby hides their connection to the vast primate culture that is their rationale and home. The idea that linguistic expressions 'have' literal meanings, as if meanings where elusive and elegantly structured properties of linguistic expressions, is not supported by how we in fact speak and understand each other, but a tempting reification of meaning as it appears through the lens of literacy. The concept of 'literal meaning' is an aspect of a mechanization of the verbal surface of language; an aspect of an enormous intellectual achievement that made possible what we today know as reading and writing, with its routinely consulted dictionaries and grammar books. Literal meaning is 'meaning for literates'. We created literal meanings together with the development of our disciplined attitude to language as literate persons. That is where the concept of literal meaning belongs and fulfils practical functions. In spite of its enormous

importance in contemporary human societies, this disciplined attitude to language *presupposes* our primal language rather than constitutes its core. The precarious role played by the concept of literal meaning in semantic and pragmatic theory is discussed in Segerdahl (1996: 53–75; 171–82).

Rather than functioning as the motor of linguistic creativity, grammar standardizes what is finite in language. But we always go astray here. We confuse language with its verbal surface, and believe that the phenomenon of language can be represented in writing, and that creativity can be analyzed in terms of recursive syntactic rules (see Hauser, Chomsky and Fitch 2002, Fitch and Hauser 2004). Even Tomasello's (2003) usage-based notion of grammar reifies the intellectual discipline of grammar, since he discusses the child's first language in grammatical terms, as if the first language *existed* in these formal dimensions, and merely was embedded in a broader cultural context. (Imposing a grammatical perspective on children's language, as a chosen method of observation, is legitimate if one is aware of what one is doing.)

That linguistic creativity is a cultural rather than a grammatical trait turns the edge of Wallman's (1992) and Pinker's (1994) critical remark that the chimpanzees Nim and Washoe cannot possibly have learned ASL, because ASL is a full language, and no ape has acquired a full language. Their notion of full languages presupposes that languages *exist* as grammatical systems. Not only does Kanzi's language acquisition and use speak against this picture, so does our human language acquisition and use, if viewed closely. A language, in the grammatical sense, is in an important sense not a 'full' language, since it presupposes primal-language skills. Stripped of the cultural substrate, grammar is empty. Kanzi masters language precisely because he acquired 'full' language *in the primary cultural sense*. That grammatical notions of language have limitations with regard to our actual language is not surprising, since grammar is an intellectually elaborated discipline designed to standardize and administer the human invention of reading and writing (Robins 1967: 13). Grammar and its formal perspective on linguistic phenomena is an important bureaucratic invention in human societies. Although this standardization is vital to maintaining humanly controlled systems of writing, it is of subordinate importance to language. After years of testing Kanzi's language in a formal manner that did not reflect how it emerged in natural settings, we conclude that studying our first language within a grammatical framework does not make scientific sense. It puts the humanly constructed cart before the natural horse.

Placement

Charles Hockett's tenth design feature (see Chapter 2: 28) is displacement: 'Linguistic messages may refer to things remote in time or space, or both, from the site of the communication' (1963: 11). Kanzi and Panbanisha's communications do have this capacity to be about things that are not in their perceptual field. But why are these two bonobos able to decide that we go to Lookout Point far away in the forest, or tell us that they saw a bad dog earlier during the day, or decide the food they want to eat later when they have proved that they can be good (after misbehaving), or ask for a food surprise hidden in the trailer? The answer is that Lookout Point, barking dogs, being good after being bad, and food surprises at various locations are never remote topics of conversation in the Pan/Homo world. These are normal features of the culture, and communications are never displaced with regard to these. Defining a central property of language in terms of what happens to be present in the perceptual field neglects how the primal language is acquired with entire ways of life. Certainly, Lookout Point is not in Kanzi's perceptual field when he decides that we go there. If it were, he could not decide to go there, since he would already be there. Discussion about things remote, in Hockett's sense, is placed rather than displaced. Kanzi's decision is placed in the daily activity of negotiating where to go. Even the remoteness of Lookout Point has its place in the activity, since deciding to go to a certain location presupposes that we are not there. We therefore replace Hockett's design feature of displacement with the design feature of placement. *Linguistic communications, even about things remote in space and time, are placed in, or belong to, cultural activities acquired with the primal language.*

Viewing our boundless first language as if it were a demarcated linguistic system makes it tempting to say that language with Hockett's feature of displacement is a more powerful 'system' than one where all communications are about things immediately perceived. Kanzi's language is more powerful than Nim's. But the word 'powerful' is misleading if it suggests that displacement is an abstract capacity of an underlying 'representational system', and that deciding where to go is an exercise of this power. In Kanzi's acquisition of language in the mere living of his life, we can see the opposite. Kanzi's language is more powerful than Nim's, not because it is more displaced, which presupposes a formal and grammatical perspective on his utterances, but because it is more thoroughly placed into the culture where humans speak (for example, when discussing where to go). Wittgenstein's language-games

give us glimpses of the design feature of placement by showing us words placed in variously shaped activities and situations.

In one NHK-documented test, Kanzi has a ball right in front of him. Sue says, 'Give me the ball that's outdoors'. Kanzi does not give her the ball he perceives just before him, but walks out and fetches the ball that Sue actually requested. His response shows that he did not acquire language sitting still at a table on which the experimenter placed a few clearly visible pedagogic items. His comprehension shows that he acquired language while moving around talking with humans about, for instance, 'the snake that we just saw outside the trailer'. Kanzi's response is displaced merely in the sense that he understands that Sue speaks of a ball that is not in his perceptual field. But the reason his response *can* be displaced, in this trivial sense, is that he acquired language with cultural activities that involve moving freely within the research center, rather than sitting still in a controlled laboratory environment talking about objects that the experimenter makes visible. Kanzi's response is placed in his mobile ways of life, which is why it can be displaced in Hockett's sense. Rather than an abstract capacity to speak of what is not in his perceptual field, 'displacement' is an aspect of how Kanzi transports himself as a linguistically communicating being.

The remarks above on the notion of displacement also apply to many linguists' notion of reference. Because they see language as if it were a demarcated second language, they view reference as a relation between this 'system' and the world. Charles Morris (1938) expressed this view of language in his classic distinction between *syntax* (the study of the 'formal relations of signs to one another'), *semantics* (the study of 'the relations of signs to the objects to which the signs are applicable') and *pragmatics* (the study of 'the relation of signs to interpreters'). This notion of reference as a relation between signs and objects led many ape language researchers to teach apes words through schematic ostensive definition procedures. Perhaps the researcher placed a bottle of milk in front of the ape, and the ape would then get the milk if she pressed the right symbol. The hope was that the ape would suddenly comprehend that the word stood for some kind of entity in the world, so that subsequently she would be able to communicate about such entities in any situation. That miraculous transition never occurred. The moment the situation was altered just slightly (perhaps the researcher asked 'what's this?' while holding the bottle of milk in front of the ape), the ape who just recently asked for milk by pointing to the milk sign no longer made the same gesture in answering the question. The conclusion of such frustrating experiences is that the ape has not understood that 'milk' refers to milk.

We rarely have such frustrating experiences at the LRC; on the contrary, we are surprised how creatively and appropriately Kanzi and Panbanisha understand and use words in new situations. The explanation, as we see it, is that we replaced isolated ostensive definition procedures with enculturation, where the same words are used in a variety of situations from the outset. Improvisation and inventiveness are self-evident aspects of the process. This made Kanzi and Panbanisha familiar with how words are placed in various cultural activities, that is to say, with a rich landscape of uses that they extend in different directions, in linguistic improvisations with human friends (when not too drowsy, remember 'open the soap'). That Kanzi, Panbanisha and young Nyota (who loves milk) know that 'milk' refers to milk, is really no more than a simplified summary of the fact that they heard and understood this word being used in a variety of 'language-games' and often improvise new uses on the basis of what they experienced and understood (just as they drink milk in different ways and often improvise). The abstract formula ' "milk" refers to milk', then, merely summarizes what we would like to think it explains: the various uses of 'milk' in actual situations.

In one of his discussions of human language, Wittgenstein (1953: 387) remarked, 'the *deep* aspect of this matter readily eludes us'. We believe this remark applies to placement; a feature of language that rarely is observed, because it constitutes the deep dimension of language. Nim, for example, did not get the opportunity to acquire full language in this cultural sense, or at least his opportunities were more limited: the 'deep aspect' of his language was neglected. By isolating Nim in a small classroom and acting as a teacher, Terrace and his coworkers did not cultivate the design feature of placement effectively, and they thereby damaged the roots of Nim's language in our mobile ways of life. Explicit instruction and systematic correction in 'horizontal' grammatical dimensions turns out to be impoverished, because such education does not place signs in the culture where they belong.

Human talk about things remote is placed in a more complex web of cultural activities than is Kanzi's, which can make this design feature more difficult to see in our own language. This is the sense in which our language is more powerful than Kanzi's language: it is placed in even more complexly interlaced cultural activities. Our capacity to talk about an event that will occur in Equatorial Guinea at 10:15 a.m., 12 July 2010, is placed in activities with maps, clocks and calendars, which in their turn are tied to ways of making journeys, collecting information and in general living human lives on our planet that cannot be surveyed once and for all. A child who begins to tell her parents what she

will do tomorrow at twelve o'clock is learning how to use the clock as a tool in our contemporary ways of living according to weekly schedules. Human children acquire language through the same kind of comprehensive process as Kanzi. They acquire their first language through enculturation.[27]

Chomsky emphasizes the same complexities of human language use as we did above in connection with 'milk', 'open' and 'ball.' One of his observations is how differently the word 'book' works in different forms of use. If a library has two copies of Tolstoy's *War and Peace*, and Peter takes out one, John the other, then in one sense they both take out the same book, but in another sense two different books (Chomsky 2000: 16–17). This variability is the design feature of placement, of which Chomsky's observation is an example. The word 'book,' in his example, is placed in two cultural activities, in two language-games. Placement means that young and immature primates are exposed to a broad variety of cultural stimuli, since new words come with entire forms of new life. Why Chomsky fails to see that language acquisition through enculturation is anything but poverty of stimulus, why he seeks refuge in a schematically simple internalist position each time the facts of human experience become complex, is discussed in Chapter 4.

Gestures and tools

The early tests of Kanzi's language comprehension eliminated all bodily expressions of language other than the acoustic products of the so-called organ of speech, the larynx and mouth: Kanzi was not allowed to see the speaking experimenter. However, it is striking how Kanzi's entire physiognomy changed as he *acquired* language. We are inclined to say that his movements of the body are those of a speaking creature. In the daily interactions that originally fostered his language we did not eliminate bodily aspects of language. Kanzi's acquisition of language included gestures that we now see as central to his language. Kanzi's gestures not only make his keyboard utterances more expressive, they also make them linguistic in the human sense, that is, they make it manifest that he means what he says in the sense that a human being means what she says. Suppose, for instance, that Kanzi points to the symbol KEY. Does he thereby *mean* something, as we humans do, or is it just a mechanical action produced because previously pointing to that part of the keyboard made a key appear? Let us look more closely at a sequence in the NHK documentary, *Kanzi, an Ape of Genius*, where Kanzi wants a key to enter the group room where his adopted mother, Matata,

is. Kanzi is separated from the rest of the group, and now he thinks it is time for a reunion. Here is what the viewer can see:

> Kanzi approaches Sue with his hand stretched out as if begging for something. Sue asks, 'Did you want something?' Kanzi immediately walks to the door and points to the keyhole. He then walks over to the keyboard and points KEY, KEY. While still pointing to this lexigram with his left hand, he turns towards Sue and gestures with his right hand. He presses thumb and index finger together as if he was holding a key in his hand. Then he says, GROUP ROOM, KEY . . . KEY, MATATA, GOOD. Sue responds, 'Ah, you want the key so that you can see Matata, and you are going to be good.' Kanzi vocalizes loudly, signalling joyfully that Sue understood what he meant.

Kanzi's gestures are scarcely extra-linguistic, but function as criteria for the linguistic nature of his keyboard utterances. If we doubt whether Kanzi really means something by pointing to various symbols, our doubts vanish when we see his utterances together with gestures such as those just described. Observe that the repetitions that some ape language critics find so bizarre actually are expressive and make Kanzi's utterances full of meaning.[28] He is nagging like a child.

Kanzi's gestures are spontaneous expressions of first-language activities. He acquired 'key' not merely by seeing photos of keys placed on clean tables, which was how we *tested* his language, but by using keys himself to open doors. When he says KEY, his entire body expresses the activity of opening a door with this tool. His gestures indicate the life where his utterances belong and are meaningful. They show not only that he means *give me the key* when he points to the lexigram KEY, but also that he can use keys as tools in a humanlike (but bi-species) culture where doors, locks and keys are commonplace. Kanzi's gestures are spontaneous expressions of language acquired in mid-action. They are manifestations of his enculturation into the Pan/Homo world.

Gestures appear bizarre and redundant in a grammatical perspective on language, but natural and even essential once we see the difference between the primal language and second languages. When Kanzi emphasizes his meaning he seeks eye contact and uses gestures that indicate the cultural matrix of his signs. Kanzi's organ of speech is his entire body as it functions in a broad variety of cultural activities.

It is not strange, then, that Kanzi's physiognomy changed as he acquired language. This change is especially evident when he produces tools and uses them.[29] Watch the scene in the NHK documentary *Kanzi*

II where Kanzi makes stone tools, and ask whether it is conceivable that the creature you watch does *not* have language! Kanzi rotates a core stone in his left hand while visually searching for the best place to strike with a hammer stone in his right hand. The moment he hears that a flake is separating itself from the core, he vocalizes to signal the event (Savage-Rumbaugh, Fields and Taglialatela 2001). Kanzi has the posture of a human craftsman, and the subtlety with which he does his job and judges its results by testing flakes against his lips provides the viewer with a striking picture of what some philosophers call intentional action.[30] If the first language develops in these embodied cultural dimensions, then it is possible to *see* that a living being has language by watching its movements. Kanzi developed a modified way of organizing actions and events, which once again reminds us of Descartes' notion of reason as universal instrument. The point is not that we already know what human reason is and now find it in Kanzi. The point is that he changes our understanding of this concept, just as he changes our understanding of the concept of language. Kanzi's tangible transformation in a human direction helps us recognize forms of reason and language in the interactions of other animals, and thereby also the most primordial sense in which we humans have reason and language. Our first language is visible in our bodies, physiognomies and gestures, and Kanzi helps us see it. That a human is puzzled and asks a question may not be quite as palpable as the fact that an antelope approaches the water hole and drinks water. We obviously share drinking water with antelopes. But when we share more subtle aspects of our daily lives with animals, perhaps with intermediary Pan/Homo beings such as Kanzi, and see our human language in them, we can begin to see puzzlement and questions as a part of what Wittgenstein (1953: 25) called 'our natural history'.

It is worth noting here that our ancestors developed bipedal locomotion *before* the large human brain developed. The hominid Lucy walked on two legs, with her hands free for a multitude of tasks and gestures, while still having the brain of a chimpanzee. The *extended* cultural flexibility that came with free hands might have driven the evolution of the human brain.

Our human gestures are innumerable and often improvised, but they are not described in grammar books. It is slowly being realized how central gestures are in human communication, beyond their use in tandem with indexicals such as 'over there' (see Kendon 1981, McNeill 1995, Haviland 2001, Goldwin-Meadow 2003).[31] Gestures and tone of voice belong to what it is to *mean* something in language. Try to pro-

nounce, 'Pick up that trash right now,' as if you read an example of an English sentence in a grammar book, but *mean* it categorically as if you did not accept any excuses! Can you separate meaning the sentence that way from how you say it? To recollect what it is to mean the sentence as if we did not accept any excuses, we enact it in our imagination. We might imagine going up to some especially cheeky teenage girl and stopping just before her with our hands firmly on our hips. Then we pull out the pin of our communicatively explosive hands and begin to point and wave, *pick it up right now*. Inhaling to make us look bigger and exploding the words between our lips belongs to what it is to mean the sentence. Whispering would make the sentence incomprehensible. That someone might make their words more powerful by whispering is not a counter-example, since that requires an even more elaborate use of the body in mastering the communicative situation. For instance, they must get the other person's attention before they can start whispering and must get the attention very much against the other person's will. Meaning what we say involves an entire choreography of human action. Do not forget the tendency to grab the other person and emphasize our meaning by shaking them. That we sometimes shake another person is an example of how frustrating it can be to mean something in actual language! Physical aspects of language that are so deeply bound up with meaning something cannot be conceived of as mere extra-linguistic assists, as we did in our early tests when we hoped that Kanzi would manifest his language as a well-behaved schoolboy (which he did). When we consider first-language acquisition and use, we have good reason to see the entire body, as it functions in everyday life interactions, as the organ of speech:

> When learning how to speak is seen as learning how to do things with words – when language is seen as emerging as a means of augmenting the gestures and sounds that are used to coordinate interactions between adults and children – it follows that there is little point in trying to draw a hard and fast line where one can say 'this is where nonverbal behavior ends and verbal behavior begins.' In other words, this means that the concept of language cannot be drawn with sharply demarcated boundaries. (King and Shanker 1997: 91)

The idea that speaking primarily consists in exercising the larynx and mouth, that speaking consists in pronouncing speech sounds that have linguistic meaning by virtue of grammar, is strikingly true of Latin

studies and originates in our standardized techniques of writing and reading. But primal-language expressions are scarcely pronounced as if read from a hidden mental script. They are declared, screamed, preached, asked or hesitated with our entire being. Writing and reading tend to make us blind to the physiognomic substrate of human language. Gestures not only emphasize *that* we mean what we say; they also make clear *what* we mean. By enacting our meaning in gestures, by visually indicating our utterances' home in culture – as Kanzi does when he brings together thumb and index finger as if he held a key – we spontaneously and unintentionally introduce new words to children who thereafter use the words with or without the gestures. One way of unintentionally transmitting certain uses of 'now' is by banging one's fist against the table in tandem with saying the word.

The extent to which our human physiognomy is shaped by our primal language has not been explored, since the radical difference between first- and second-language acquisition has not been recognized in our intellectual tradition's understanding of language, and neither has the notion that our ways of life are visible in our bodies. Kinji Imanishi, however, emphasizes the unity of body and life:

> Thus, we recognize that an organism's form to some extent reflects its way of life. In other words, although the morphology of a dead specimen has a taxonomic significance, from an ecological standpoint, in which the true and original meaning of the form should be sought in its natural living conditions, we always connect the organism's structure with its lifeway. That way, the form is not merely morphology, but fundamentally reflects the organism's way of life. This we call the life form. (Imanishi 2002: 39)

Seeing language as a visible aspect of Kanzi's body enables us to perceive our human body and its characteristic movements as expressions not only of our innate biology, but also of the primal culture that drives maturation in early childhood and that houses language. Language is to a great extent a visible phenomenon: an aspect of our enculturated body.

Culture-sustained vocal speech and other media

It is generally assumed that apes cannot produce vocal speech since they cannot achieve the required voluntary control over breathing and speech-relevant musculature (see Lieberman 1991: 72–4). Our experi-

ence of how enculturation transforms primates, even their bodies, makes us doubt the methodology according to which many of these conclusions are reached. Drawing conclusions about the capacities of entire species on the basis of observations of how some individuals behave at some point of time neglects the plastic cultural dimensions of animal life. No one would claim that humans lack the capacity for language, if the humans under study had not matured among other humans, in our kind of culture. Kanzi demonstrates that we are wrong to draw such conclusions about apes. As a result of his enculturation, Kanzi can blow up a balloon (and make a knot), he can blow out candles (see *Kanzi II*), and he can submerge his head in water and blow bubbles. He definitely controls his breathing. Conclusions about what animals can and cannot do must be more carefully delimited to specific populations, and more general conclusions about the capacities of other species require that researchers vary the cultural parameters, the historically changing circumstances in which young animals mature.

It is difficult for an ape to produce speech sounds that humans recognize as words, but one would suspect that enculturated apes would at least try to communicate vocally with humans, since the humans with whom they share their lives do so all the time. Kanzi answers many of our questions affirmatively by vocalizing '*eee*' – this occurs several times in the documentaries – so there are indisputably many occasions on which he speaks with his voice instead of with his keyboard. But there is more to Kanzi's use of his voice, as he often modifies his high-pitched *eee*-sound in throat and mouth so that it starts as a closed vowel and ends as an open one. It sounds as a prolonged American *yeeeaaahhh*, but transposed to the bonobo high-pitched register. But is he really saying 'yeah'? Most likely, as it is his vocal response to many of our yes/no-questions, and it is produced in tandem with gestures that indicate 'yes, do so', and he does not protest when we treat his vocal response as an affirmative answer.

There are two aspects of Kanzi's speech: the intermediary Pan/Homo culture supports both Kanzi's tendency to use his voice where otherwise he uses his keyboard and also our ability to perceive his vocalizations as words spoken to us. A visitor who happens to overhear Kanzi's *eeeaaahhh*-peep would probably not react, 'I heard someone say "yeah" in a strange squeaky voice', and would hardly write down what had been heard by spelling the word 'yeah'. The idea that it was language would probably not even register, since Kanzi's vocalizations sound so different from human speech. It is tremendously difficult for non-members of the Pan/Homo culture even to try to hear language in what

sounds to them more like the squeals of a young child. Visitors easily recognize human language in Kanzi's movements of the body when he points to lexigrams, but they ignore his vocalizations as inarticulate side-products of his attempt to communicate by using lexigrams.

When Kanzi's vocalizations are heard in the stream of shared everyday life occurrences, however, it gradually becomes possible to hear what he says in his high-pitched voice. Newly-employed caregivers who have stayed just a few weeks and have watched us interact with Kanzi slowly begin to hear words in his vocalizations, not only because they have become accustomed to the bonobo register, but above all because they have become accustomed to the way of life in which Kanzi's vocalizations are used and have linguistic significance. When these caregivers hear us ask Kanzi, 'Do you want to go to Lookout Point today?', they know that Kanzi will answer in one way or another. Kanzi regularly answers questions, so caregivers expect an answer, and when they hear Kanzi's *eeeaaahhh*-peep, there is a point where they respond, 'My god, he said yeah!'

But are we not deceiving ourselves? The high-pitched sounds the bonobos create do appear incapable of housing meaningful language. How can aspects of the world be represented articulately in what appears more like the squeals of a young child? It seems as if bonobo sound patterns were not sufficiently fine-grained to harbour meaningful language.

When we first started documenting bonobo speech, we assumed that the speech stream could be analysed acoustically as a sound pattern that would prove analogous to certain English words. We managed to show acoustically that the apes' vocalizations varied systematically with simultaneous lexigram use for banana, grape, juice and yes (Savage-Rumbaugh, Fields and Taglialatela 2001). Even people who cannot hear words in the vocalizations can hear these systematic variations. However, we also assumed the possibility to hear English sound patterns – English sung in a strange key – simply by (i) knowing English, (ii) becoming accustomed to the bonobo register and (iii) listening carefully. Since blind people develop advanced hearing abilities, we hired a blind research student who listened to hours of taped vocalizations, but in contrast to the caregivers who were introduced into the Pan/Homo culture, she could not detect one single word in the high-pitched sounds she tried to analyze. So, how can those who interact with the apes hear what the bonobos say with their voices (after a while sometimes even without seeing the apes)?

The answer that best fits our experience of bonobo speech is the following: what makes most LRC workers able to hear words in the

bonobos' vocalizations is the intermediary Pan/Homo culture into which they have been introduced, for that is where the vocalizations have significance as spoken words. The words we hear are not heard as sounds, but as things said to each other in dramas of daily life. We hear that Kanzi shouts '*Clara, Clara, Clara*', while he looks towards the kitchen where Clara is. We ask Kanzi what he wants to eat and hear that he answers *peanuts*. It is because we hear what Kanzi says to us in our daily interactions with him that we can begin to trace analogies to spoken English. The subtle distinctions in the sounds he produces, which correspond to distinctions in spoken English, are undetectable unless you already understand what he says to you. To experience the relevant analogies, you must already understand his speech. Then and only then are you able to say, 'I heard the *p* in peanuts', even though the sound Kanzi produced is different from the sound humans produce when they say 'peanuts.' The most recent acoustic analyses reveal that the bonobos produce structurally distinct speech sounds that vary systematically and predictably with semantic context (Taglialatela, Savage-Rumbaugh and Baker 2003). But the ultimate motivation of the acoustic research is that those of us who are attuned to the intermediary Pan/Homo culture quite simply hear what the bonobos say to us.

It is worth mentioning in this context that parents understand their young children's speech even when it is incomprehensible to strangers, not only because the parents have become accustomed to the sounds their children produce, but also, and above all, because they interact with their children daily and know how their children *use* their voices in situations that could not be more familiar. (Remember also that linguistic analysis of the 'sound systems' of languages is informed by understanding. If linguists do not understand the language they analyse, they need the cooperation of an understanding informant.)

For an outsider, Kanzi's speech sounds almost continuous, like the squeals of a young child. But when his speech is perceived in an intermediary culture where seemingly small modifications of his voice are *used* as distinct words with distinct functions, attuned participants hear articulate speech where strangers perceive inarticulate peeps. A powerful exhalation at the beginning of a vocalization can be heard as the analogue of the consonant 'p' in 'peanut'. To discover the bonobos' vocal medium of speech is to discover its significance as spoken words in our lives with them. The possibility of words in the bonobos' vocalizations is not merely an acoustic possibility, but presupposes the entire language-enriched culture in which their vocalizations can be found to have significance as words.

In order to make bonobo speech manifest also for non-members of the Pan/Homo culture, we devised a test where the apes must use vocal speech between each other. We separate Kanzi and Panbanisha and show Kanzi some food that he and Panbanisha like (for example, grapes). We then explain to both that they can share the food when Kanzi shouts to Panbanisha what we showed him and Panbanisha tells us what he said by pointing to the correct lexigram. Panbanisha resents being tested and often refuses to answer as long as it is evident that we are just testing her. She often tries to prevent her son, Nyota, from answering in her place. However, sooner or later some unexpected event makes the situation more natural and then she takes her keyboard and gives us the right answer. These tests are documented on video and demonstrate that the bonobos understand their own speech easier than we humans do (for detailed descriptions of tests and test results, see Savage-Rumbaugh, Fields and Spircu 2004: 567–71).

Our conclusion is that the bonobos' spoken utterances have meaning not by representing life, but by belonging to ways of life. Their vocalizations do not have to be acoustically articulate to function as a medium of language. We hear what Kanzi says in his high-pitched voice, not because our Pan/Homo world had somehow become 'represented' in the sounds he produces. We hear what Kanzi says because his vocalizations are *used* as distinct words in our culture. The idea that an articulate sound system is required for meaningful language is perhaps as naïve as the idea that a part of the brain must be red when we see something red. We replace the linguistic doctrine of the double articulation with the double aspect of the Pan/Homo culture. The life we share with Kanzi, the primal language he already has and expresses through the medium of the keyboard, is a resource that makes production and understanding of his high-pitched speech possible. His primal language, interlaced with the Pan/Homo culture, motivates him to communicate in a new medium – with his voice – and it makes us capable of hearing what he says, in spite of our human difficulties of hearing words in bonobo voices. The basic substrate of meaning is the daily activities where words are used, which permeate hearing what others say: these activities constitute our primal language. Production and perception of meaningful speech are sustained by culture.

If the substrate of meaning is the use of expressions in shared activities, it follows that linguistic media other than speech can be integrated into these or related activities. We communicate at the LRC using lexigrams, human speech, bonobo speech, gestures, some ASL signs, and even writing. For instance, when the apes are at the far end of the group

room, we cannot always see to what lexigram they point. We may then ask them to write the lexigram with chalk on the floor. They do so and point with the chalk on the sign, just as they usually point to lexigrams on the keyboard with their index finger (Savage-Rumbaugh, Fields and Taglialatela 2001; see also NHK documentary *Kanzi II*). The media we use shape our interactions, just as an electric screwdriver remodels the activity of tightening a screw. It contains new possibilities and new constraints. The keyboard is a central element of the Pan/Homo culture, and it does make our interactions unique in many respects. Since new lexigrams often were added because some unexpected event made it natural – for example, TACO after a Mexican fast food restaurant opened nearby – the keyboard resembles a portable photo album of shared memories. The keyboard is the Pan/Homo world and its history in condensed symbolic form. It is a way of organizing our memory and everyday life. However, even though it is possible to point emphatically to a lexigram, it is difficult to express nuances by using the keyboard, and Kanzi's use of the keyboard is almost always complemented with gestures and very often with vocalizations, some of which we classify as speech in the sense that he speaks to us using his voice: he utters the words that correspond to the lexigrams he points to. There are several limitations implicit in the keyboard and these limitations function as cultural pressures towards using speech instead. Keyboard-talk is typically a one-to-one experience. With more than two participants, it becomes difficult to converse. There is no clear conversational rhythm and it is unclear whose turn it is to approach the keyboard and point. And when we use a keyboard equipped with a voice box, it can be a slightly schizophrenic experience to hear all the participants' contributions expressed by the same voice. It is also difficult to compose multi-lexigram utterances in a fluent manner, especially since many humans use the keyboard merely in a stumbling second-language fashion. Another problem implicit in the keyboard has to do with the fact that apes' social life is high-speed performance. They normally detect and negotiate social events quicker than humans do. Using the slow medium of keyboard-talk is therefore sometimes a frustrating affair for them, especially when they talk with humans who are not skilled keyboard users. It is time-consuming to sort out misunderstandings and repair mistakes, and sometimes communications are so slow that other events take the attention away from what is laboriously being communicated. A clear advantage with the keyboard, however, is that it is easy for non-members of the culture to perceive linguistic communication in the apes' behaviour. But those of us who understand bonobo speech

tend more and more to use the keyboard only when we are forced to. Simply speaking is more efficient and in harmony with the rhythm and social life in which we find it natural to negotiate the events of daily life. When the keyboard does not tie together only two members at a time, it becomes natural for the entire Pan/Homo group to talk. There is, in conclusion, a pressure within the Pan/Homo culture towards vocal speech. This may shed light on the evolution of the human speech organs, since it indicates that language in the broad cultural sense can favour the vocal medium over one that relies more on visible body movements.

Someone might want to object: 'But even if there is such a thing as bonobo vocal speech, surely human speech is categorically different. Our vocal speech is articulate already at the acoustic level, by virtue of its repertoire of distinct vowels and consonants. That's an important reason why human vocal speech is such a powerful means of communication.' It belongs to the backbone of a grammatical outlook on language that the most central aspects of linguistic meaning are transmitted from speaker to hearer by virtue of the phonological, morphological, syntactic and semantic properties of what is ultimately an acoustic speech stream, conceived of as the basic substrate of meaning. By focusing on the aspect of language that we listen to when we write down what someone says, speech is conceived as an ethereal writing in thin air that rapidly fades. That is why many linguists' discussions of the origin of language focus on the evolution of the organ of speech and on the neurological structures that supposedly house grammatical processes (e.g., Lieberman 1984, 1991, Bickerton 1990, 1995). Speech is indeed a vital feature of human language: our ability to control our human voice neurologically, and our motivation to listen to other human voices, surely contributes to the development of language in the complex form in which it exists in human life. But is meaning therefore a property of an acoustically articulate speech stream? Recall how our different understandings of 'Bill opened the mountain' drew on subtle kinships between cultural practices. We attended to the sentence and understood it according to its perceived place in a culture that already contains activities where the word 'open' is used. Searle's hypothesized mediation by abstract semantic content based on rules that he assumed must be applied to otherwise meaningless speech sounds appears to be a false schematization of what it is to hear what someone says to us. Our understanding of what is said is, from outset, integrated into the activities in which we engage. We understand sloppy speech, that is to say, normal speech, as readily as we recognize friends

in the street even though they have not combed their hair. People may mumble or speak strange dialects, they may stammer or speak in squeaky voices, and children may speak in ways you never have heard before or with their mouths full of food. You might not understand, but when you do, you perceive what the other person says to you in a shared world, and perhaps you take a drive in your car, confident that the new tunnel is open for traffic. Therefore, what ought to be studied by those of us who are interested in the nature and origin of the important medium of speech is not merely the development of the larynx and mouth, or our neural control of them, but the development of these physiological and neurological traits in conjunction with an entire culture that sustains their use in linguistic communication.

The fact that linguistics traditionally emphasizes the existence of a perfectly spelled phonemic level of language, behind the illegible acoustic speech stream, epitomizes that linguistics has its origin as a science of writing (Robins 1967: 13). Linguistics transfers what we say to each other to an idealized writing – phonological analysis – otherwise natural language would disintegrate as a subject matter for linguistics in the traditional sense. It is therefore no coincidence that Hockett's third design feature of language is rapid fading. The notion of rapid fading presupposes an implicit comparison with writing. Is life characterized by rapid fading because events are not like photographic stills? When we make the comparison to photographic stills we might be inclined to agree. Such a claim therefore reveals our inclination to make certain comparisons as if they were absolutely self-evident and inscribed in nature. One of the roles that primatological studies can come to play for our self-understanding is that of providing us with correctives to the almost irresistible tendency to identify components of human nature with our most important intellectual techniques (such as writing). This tendency might be one reason for our inclination to see ourselves as categorically distinct from other primates. Identifying components of human nature with our most important *inventions* undoubtedly makes human nature seem unprecedented in nature.

We discuss Kanzi's speech not for the purpose of proving that he has true language because he too can speak with his voice. The point is rather that speech is one medium in a series of linguistic media that serve similar purposes of linguistic communication because they are incorporated into similar forms of interaction. Differences between linguistic media do shape culture and communication. We cannot shout with the keyboard, for instance, and therefore cannot communicate with lexigrams unless we are right in front of each other. But a medium,

such as keyboard talk, functions linguistically only as an integral aspect of the activities that harbour them. 'Good morning!' functions as a greeting only if we do greet each other by speaking those words in characteristic life situations. Human speech may be very efficient and biologically better adapted for daily use than Kanzi's speech. This is still not a categorical difference. It does not make human vocal speech autonomously meaningful, while Kanzi's vocal speech requires an understanding of the cultural context (and we must not forget that the bonobos understand their vocal speech easier than humans do). The way we humans perceive, or fail to perceive, what Kanzi says to us in his high-pitched voice, changes our picture of meaningful language, and makes it more evident that a distinction between language and situation would be an artefact. First-language utterances do not 'represent' life. They belong to life. Explaining to Kanzi, 'Clara is washing the onions,' is an action in language belonging to a familiar sequence of actions and events. The utterance fulfils a function in Kanzi's life – he now waits trustfully and cooperates – just as washing the onions is an action in his life (he often helps caregivers in the kitchen, see *Kanzi I*). The idea that speech 'represents' reality belongs to viewing our primal language, which we acquire in mid-action, as if it were a demarcated second language, existing in peaceful seclusion from the activities of daily life.

Let us conclude this section about bonobo speech with a remark on the genetics of human language. We believe that the bonobos' vocal speech makes possible an alternative interpretation of the discovery by Wolfgang Enard et al. (2002) of a uniquely human variant of a gene called FOXP2, which is supposed to be involved in speech and language (this is still only an assumption). The new possible interpretation, based on our findings, is different from the geneticists' interpretation, which presupposes that speech is the essence of language and precedes culture. We reason as follows: if bonobos, with their genotype, can become as humanlike as our bonobos became through enculturation in an intermediary Pan/Homo environment, then the relevant question to ask is not only how a certain genotype is expressed in a certain phenotype, but also, as William Fields emphasizes, how *many* phenotypes a given genotype can have. It is highly improbable that a human variant of one single gene, FOXP2, can explain the origin of language and culture, and the geneticists are not making such a claim either. But this gene cannot, in our view, even be described as 'involved in speech and language' except if we conceive of the gene and its effects on the facial musculature in a wider cultural framework – a framework where hominids and

humans, during hundreds of thousands of years of seamless genetic and cultural evolution, slowly developed vocal forms of communication between each other in their daily doings. By exploring the cultural dimensions of language, we make it possible to apply the notion of a gene-culture coevolution – suggested by Lumsden and Wilson (1981), Boyd and Richerson (1985), Durham (1992) – to language. The manner in which Kanzi acquired language, in vast cultural dimensions, suggests that speech and other demarcated media function linguistically by being incorporated into a cultural framework that we might call the first language, the primal language, or simply language. The demarcated medium, speech, presupposes language as an aspect of culture. It is in the framework of ways of life where vocal sounds function communicatively that a mutation that promotes *finer* control of the larynx and mouth also can promote articulation, and thereby further development of language through the daily use of a more easily controlled medium. In other words, a reasonable way of making sense of the genetic discovery, given the LRC data, is achieved by reversing the statement with which the geneticists open their article: 'Language is a uniquely human trait likely to have been a prerequisite for the development of culture' (Enard et al. 2002). We would rather emphasize the possibility that culture is a prerequisite for the human variant of FOXP2, providing the relevant selection pressure. As an effect of his enculturation, Kanzi acquired the ability to control his breathing and to speak with his voice, which he is supposedly not able to do, being an ape.

These facts, in conjunction with the genetic discovery, provide a beautiful example of how cultural developments might transform the selection pressure and contribute to driving the evolution of aspects of our ability to control our human speech organs. 'Anatomy is always, in a sense, playing catch-up with the more flexible brain', Savage-Rumbaugh, Shanker and Taylor (1998: 182) remark. This effect should be more prominent the more flexible a species' brain is. However, since Kanzi acquired so many aspects of our human language, in spite of the fact that he is a bonobo, most of the traits that come into play in language must have developed for other (but perhaps related) functions. It is, in other words, reasonable to assume that constellations of bonobo genes that previously were not involved in speech and language *became* involved in speech and language in a cultural environment dominated by language. Just as our contemporary environments challenge our genes and make them involved in the development of new diseases, so the intermediary Pan/Homo culture challenged young Kanzi's genes and made them involved in his development of language: that became

one of their functions. When new generations of bonobos mature in this culture, their genome functions differently during ontogeny than it would otherwise do: in such an environment, the bonobo genome contributes to language development. Language genes would, in a certain sense, appear from one generation of bonobos to the next, not because the genome changed – it is the same – but because the genome *functions* differently during ontogeny in a bi-species environment dominated by language. A cultural perspective does not suggest that the genotype somehow becomes irrelevant; 'rather, it signifies that even the role of genetic factors can be understood only within the context of the culture in which a child develops' (Shanker 2002: 436).

Cultural unity

Rush Rhees remarked that identifying language with language-games makes it difficult to discern the unity of language: Wittgenstein 'does not say whether people who might take part in several such games would be speaking the same language in each of them' (Rhees 1970: 73). It is tempting to think that the unity of language is that of a specific language, such as English. People who take part in several games might be speaking the same language in the sense that they speak English in each one of them. A problem with this notion of the unity of language is that it annihilates the insights already achieved into how words function and have meaning. It presents language as if it were one of the second languages that we can learn when we already speak. We need an understanding of the unity of language that delimits the language-game analogy without making it superfluous.

The design features already described pull in the same direction. Kanzi's language is not basically a specific language such as English, Yerkish[32] or ASL, and neither would it be faithful to Kanzi's language to describe it as a heap of language-games, for he was initiated into a coherent culture where these language media, and forms of interaction, are submerged. We ask Kanzi questions in English and he answers on his keyboard, but we do not want to say that he answers us in a different language, for he acquired English and lexigrams simultaneously in the same comprehensive way. It is like playing chess with someone who has designed his own chess pieces that perhaps look more like coins but are used as chess pieces. (Suppose that you ask a question and receive an answer in the form of a gesture: was the answer in another language?) Neither do we want to say that he reacts appropriately within an insulated language-game, for answering questions is always done within

some longer stretch of conversation or interaction that has occurred in some situation of Pan/Homo life. The unity of Kanzi's language, then, is not primarily that of a specific language (for example, Yerkish lexigrams), nor is his language a formless heap of language-games. The unity of Kanzi's language coincides with the unity of his humanlike life, which is shaped by the various linguistic media that we use in the Pan/Homo culture. We understand each other because we live the same life with language expressions. Whether we speak with our voices or point to lexigrams is secondary, for our expressions are used the same basic ways in the same primal language. This is the sense in which Kanzi answers in the same language we ask questions, even though he often uses a different medium.

The unity of Kanzi's language can perhaps be compared to the unity of a typical day at the LRC. In the morning we might decide to go to Lookout Point, after lunch we pack our cool bags, in the afternoon we unlock the door and go out into the forest, and in the meanwhile hundreds of similar threads of events crisscross and form a web that resembles how actions and events hang together – or clash – in human life. All Kanzi's utterances in various languages, all his linguistic interactions, are harboured by this way of life: 'And to imagine a language means to imagine a form of life', Wittgenstein (1953: 19) says. The unity of Kanzi's language coincides with the unity of the intermediary Pan/Homo culture. To disrupt this culture is therefore to disrupt his language, and if the culture flourishes, his language flourishes.

It is tempting to object: 'but when humans understand each other because they speak the same language, surely it is because they speak the same *specific* language, such as English!' This objection is true when we are dealing with issues of communication among persons who already speak. The specific language is a relevant variable that human adults often must take into consideration. When one adult does not understand what another says, this may typically be because they speak different languages. We deal practically with this problem by, for instance, studying foreign languages, or by using phrasebooks. But if a young ape or a six-month-old child does not understand what humans say; is it because they do not understand their specific language? Can we solve this communication problem too by teaching the specific language? That is what Terrace tried with Nim, but also why he was less successful: Nim not only lacked the specific language that humans used with him but also he lacked their culture and its connection to the use of ASL outside the classroom. His signs were not planted in the soil of culture.

Noam Chomsky is once again right in his warning against what he calls ordinary notions of language, which identify language with standard languages defined by dictionaries and grammar books and sanctioned by national academies. Such erudite notions of language are useful for certain practical purposes and provide a natural perspective for language teachers; but as Chomsky remarks, these notions 'are not designed for inquiry into the nature of language' (1996: 558). The perspective on language that is natural for adults who already speak easily misleads us when we consider how language first appears in young apes or children who do not yet speak at all; who do not yet have a primal language.

Consider a young child who learns the numerals for the first time. What does she learn? A language? When she says how much two and two is for the first time, her parents rejoice, 'Oh, you can count,' and not, 'Oh, you can speak such exquisite English.' A child who learns the numerals the first time learns to count in the relevant life situations, rather than to speak a specific language. When the child grows older, however, she will study a foreign language in school. She must now learn the numerals a second time, those belonging to the foreign language. But this time she does not have to learn to count, or why humans count. She already can count and is familiar with many of its functions in human life. She learned this the first time she learned the numerals. When the language teacher asks questions, she is not testing the ability to count. She is testing the ability to use foreign expression in the familiar practice of counting. When the pupil answers correctly, the teacher exclaims, 'Oh, you speak such fine French.' Not until now, sitting still in school learning the numerals a second time, does the child learn to 'speak a language'.

This asymmetry between first- and second-language acquisition is exemplified in field after field. Take the example of telling the time. A child who begins to tell the time goes through years of practical initiation. She is exposed to what clocks and watches look like, where they are found, on which occasions one glances at them, and how they are used when one wants to see a TV-program, or when one makes arrangements to meet someone. Parents who unintentionally initiate their children into the practice of telling the time expose their children to something more extensive than what is intentionally taught in the study of how to tell the time in French (when the students have already mastered the use of clocks). It is when children begin to act with words in human life situations that we react by saying that they 'begin to

speak'. Only later, in school, do they learn to 'speak French' or some other specific language.

Here is another example indicating why it is misleading to say that children who begin to speak the first time begin to speak a specific language. A newborn child cannot speak at all. What does that fact mean? Does it mean that she can speak neither Greek nor English, nor French? Imagine pointing to a newborn child and saying, 'She speaks neither Greek nor French, nor any other language'! It is difficult not to smile at this suggestion, for it presents the child as a teenager who merely has been inattentive in school; that is, as someone who already speaks (only no foreign language). This is, essentially, Chomsky's analysis of the fact that a newborn child cannot speak: she knows all the essentials of human language, except the details characterizing specific languages. This analysis is superficial, for the child has not yet matured into the human ways of life within which French can be substituted for Greek. The cultural framework of languages is not yet developed. The notion of mastering or not mastering specific languages makes sense only when the child already is enculturated and speaks. It presupposes an already developed primal language.

It might be possible to place Kanzi in a classroom and teach him new signs for Lookout Point and other features of Pan/Homo life. It might be possible because the *forms of use* of the signs have already emerged in his life (for example, when we discuss where a food surprise is hidden, when we inform him where Sue and Panbanisha are, or when we discuss where to go after lunch). What emerged in Kanzi's childhood was *more* than a specific language, and because of what he acquired as a child, he might now, if he is motivated, 'learn a language'.

Here is a further example that reminds us of the same thing. Parents all over the world say that their two-year-old children begin to speak, simply to speak, as if a two-year-old Greek child began to do the same thing as a two-year-old American child. There is a vital sense in which this is true. Children's first words belong not only to different languages, but also to a more or less common human way of life (of which Wittgenstein's language-games provide glimpses). Language is not acquired as a separate entity. We utter words as elements of our daily life activities, rather than as components of languages. In one sense, the expression 'it's ten o'clock' belongs to English, but in another and more immediate sense, it belongs to life activities that are almost the same wherever people use watches and organize their day according to the clock. It is in this latter sense that children all over the world begin to do the same

thing when they begin to speak. They begin to count their toys, for example, or to use a watch to tell the time, and they begin to do so in situations where these activities fulfil functions. From this broader cultural point of view on human speech, one specific language can almost arbitrarily be substituted for another language without changing the activities and life situations within which we speak. Children's first utterances belong to common human ways of life. An emphasis on the specific language is out of place when children begin to speak the first time, except, perhaps, when a bilingual environment makes this perspective on language relevant.

Speaking is only occasionally speaking a specific language. It is primarily and most often speaking, simply speaking. It makes sense to say that a person speaks or does not speak a specific language only if they already *speak*. We do not say that a one-month-old infant 'doesn't speak English': the infant simply does not speak. The variable 'the specific language' presupposes mastery of language in the broad cultural sense that we expound in this catalogue. This primal sense of speech is not 'articulation.' When we ask someone to tell us the time, for instance, we are not asking them to articulate certain speech sounds, but to look at a watch and tell us the time in some situation where this procedure has a function (we might be waiting for the bus). Looking at the watch, in this kind of situation, *belongs* to what we mean by 'telling the time': it is not merely a preparation for telling the time. 'Telling the time' is an entire procedure. And when we ask someone to say what they want for dinner, we ask them to make a decision, and this involves more than using their voice. The situation calls for an answer, and the answer has a function in the situation. Deciding 'onions,' as Kanzi might do late in the afternoon, belongs to what it means to *say* what one wants for dinner. Not only is the notion of language different when we talk about language rather than languages, so are the notions of *speaking* and *saying* things to each other. It is therefore natural for us to tell visitors, 'Look, Kanzi is speaking to you', or 'Panbanisha wants to say something to you', even when the apes use their keyboard instead of their voices. What the apes are doing with the keyboard has, in the situation, the *functions* that speaking and saying things to each other has.

These considerations indicate that the phenomenon of language is not exhausted by the totality of specific languages. Language exists at a more primordial level than 'specific languages'. When the social anthropologist Ingold (2000) emphasizes that speaking always is speaking a particular language, we believe he overlooks the significance of the fact that we would not analyze a newborn child's lack of language by enu-

merating all the languages the child does not speak. The child quite simply does not speak, and that is a more 'fundamental' inability than not being able to speak a particular language.

Are we dismissing the notion of language as a specific language such as English? No, that notion is relevant for many practical purposes of human life. But its importance for mature humans who already speak must not mislead us when we consider what it is to acquire language from scratch during childhood immaturity; when we investigate the most fundamental features of language. Our first language is indistinguishable from the life in which we speak. The dichotomy between specifically linguistic knowledge and background knowledge about the world is the result of using a perfectly legitimate notion of language (that of a second language) in an illegitimate fashion (as a model of the primal language). It is interesting that this is the same conclusion that AI researchers Winograd and Flores (1986) reached in their discussion of their own failure to simulate natural language syntactically in computers.

Let us state the point clearly, so that no one believes we reject the intellectual discipline of grammar. The grammatical perspective on language, which in various forms is the predominant perspective on language in linguistics, is a perfectly legitimate, useful and important perspective on languages and language learning among humans *who already speak*. When we are dealing with language and language learning among children and nonhuman primates who do not yet speak at all and who are in the process of acquiring language for the first time, however, the grammatical perspective presupposes too much of what it means to be able to speak, and we must broaden the scope of inquiry to include what from a grammatical perspective would be classified as extra-linguistic features, but that we see as the cultural backbone of language as it is originally acquired in early childhood. When a child begins to speak for the first time she acquires ways of life that she does not have to learn again when she studies foreign languages. All second-language acquisition presupposes these more general forms of human interaction: the 'language-games' that develop in this early phase of human immaturity. We identify language with these primal forms of interplay in daily-life situations, and they continue to be the backbone of language in adulthood. This behaviour is general, but not abstract in the sense that Chomsky's Universal Grammar is abstract. It cuts across languages and invented symbol-systems; that is, precisely because language is part of more general cultural behaviour, it can express itself in different spoken languages, sign languages, ape gestures, printed

abstract symbols, and so on. The unity of *a* language, such as English or ASL, may perhaps be described as the unity of its vocabulary and grammar. But there is a unity of language beyond vocabulary and grammar. It is the unity of a certain kind of culture, of a certain form of life: one that *houses* specific languages all over the world.

Non-arbitrariness

Charles Hockett's eighth design feature is arbitrariness: 'The relation between a meaningful element in language and its denotation is independent of any physical or geometrical resemblance between the two' (Hockett 1963: 10). Ferdinand de Saussure (1966: 68), however, remarked that arbitrariness is a principle that 'dominates all the linguistics of language'. The Swiss linguist's carefully reflexive presentation of arbitrariness as a *principle of linguistics* is more appropriate since arbitrariness belongs to viewing language as if it were one of the second languages that we can learn when we already speak. There is, for instance, no general dictionary of language for language students to learn but several dictionaries of specific languages. It is our impression, however, that arbitrariness (as well as Charles Sanders Peirce's notion of abstract symbols, which he contrasted with non-arbitrary icons and indices) often is naively taken for a property of language itself, even as it is originally acquired and used. Along with displacement, the arbitrariness of abstract symbols is somehow assumed to make human language more powerful than animal communication systems. It is as if arbitrary and displaced symbol use allowed humanity a route of escape from the bonds of nature and history. It is obviously being taken for granted that nature and history are burdens rather than creative resources.

Kanzi's acquisition of language through enculturation gives us a different vantage point from which to understand and evaluate the arbitrariness of the linguistic sign. The lexigrams used by Kanzi, Panbanisha and her two sons Nyota and Nathan are indeed arbitrary abstract symbols according to the criteria of linguists and semiotic thinkers, but that does not excite us. The deeper impression on us is what is not arbitrary, and that allows the arbitrariness of signs.

The lexigrams used at the LRC function linguistically because we introduced them as ways of communicating with each other in our daily doings. That the specific signs are arbitrary means that we could easily have designed the lexigrams differently. But it would have been difficult and unnatural, or even impossible, to cultivate different *uses* of the signs in the same arbitrary spirit! Should we replace greeting each other

with some hitherto unheard of practice, the point of which may be unrelated to our primal culture? Terrace tried to teach Nim an arbitrary system of signs, but neglected the more primary *forms of life* in which words and signs are used more or less unanimously by humans, although grammar and vocabulary vary. It was by exposing Kanzi to a variant of this general and largely non-arbitrary primal culture that he acquired the ability to use signs that linguists would classify as arbitrary and abstract. Terrace's approach to Nim's language acquisition is perhaps an expression of our more general lack of human self-understanding. We fail to notice what is most evident, the ocean on which we sail every day, the most immediate features of primate life among ourselves.

When we ask questions in English, and Kanzi, as a matter of course, answers us on his keyboard, this can be said to reveal how arbitrary the linguistic sign is compared to its non-arbitrary (but not fated) forms of use in our culture. When Kanzi tries to use his voice where otherwise he uses the keyboard, and in spite of his difficulties in doing so, it reveals how omnipresent the cultural matrix of language is, since it supports both his efforts and our ability to hear what he says. The arbitrariness of the linguistic sign, understood on the basis of our findings about the primal language, speaks against letting this secondary and derived feature govern our understanding of the essence of language. Such an understanding would, as we remarked in the previous section, employ a perfectly legitimate perspective on language in an illegitimate fashion. This category mistake of seeing our primal language as if it were a demarcated second language led Terrace to teach Nim what is arbitrary in language as if it were its backbone. It also led Boesch and Tomasello to think that language *must* be learned via imitation:

> Linguistic symbols can only be learned via imitative learning, since there is virtually no way to discover arbitrary social conventions on one's own. (Boesch and Tomasello 1998: 601)

To the extent that linguistics studies what is arbitrary in language, it is not designed for inquiry into our primal language. Chomsky's attempts to make grammar universally valid illustrate the point, since they become so constrained. Why search for linguistic universals within a grammatical framework, when the whole point of grammar is to control what is unique in specific languages? Anthropology can perhaps provide us with more straightforward descriptions of what it is that all humans begin to do when they begin to speak the first time (see Shanker 2001).

Malinowski (1944: 5), for instance, wrote: 'I submit that the linguistics of the future, especially as regards the science of meaning, will become the study of language in the context of culture.' This requires that anthropology perceives linguistic differences as variations of easily unnoticed but very common cultural themes; just as Darwin saw species as variations of the themes set by a common ancestor (the fact that we are primates surely shapes human culture and forms of language). It requires that anthropologists describe linguistic phenomena in their own cultural dimensions. By representing forms of expression grammatically, in writing, as if this were the self-evident way of documenting language, and thereafter noting connections to an external cultural context, such as the social status of the person addressed, linguistic practices often appear to be instances of a mysterious phenomenon called 'linguistic relativity' (Whorf 1956, Lucy 1992). Written transcription of verbal forms of expression splits first-language activities into two halves: language and non-language (thought, perception and so on). The attention is then easily drawn from language in its original cultural dimensions to an illusory causal relation between 'the language system' and what is outside of it. Wittgenstein's language-game analogy is of value here, since it allows us to see the primal cultural non-arbitrariness of human language; a more primordial unity of words and life beyond arbitrary lexical and grammatical differences. Words are from the outset described by Wittgenstein as elements of daily practices in harmony with certain very general facts of nature and it is normally unimportant whether German or English is spoken in his language-games: 'The aspects of things that are most important for us are hidden because of their simplicity and familiarity' (Wittgenstein 1953: 129).

Reflexivity

Reflexivity, or communications in language about language, is the only design feature that our catalogue has in common with Hockett's (although in his catalogue it is listed as design feature 15). We may characterize language as the reflexivity of human life, since everything we do and experience can come to some expression in language, although this often involves difficulties and sometimes even severe misunderstandings. What is that over there, for instance, is it a snake, a branch or just a shadow? And how should we act; should we approach it and see what it is or should we make a detour? Life with children and apes is profoundly changed when we begin to discuss what we are doing while doing it (compare Descartes' notion of reason as universal instrument).

One aspect of the language by which everything we do at the LRC is mediated is our commentary upon the language we use. Since the keyboard is a somewhat rigid medium of language in which it is difficult to express nuances and communicate new meanings clearly, a frequent activity at the LRC is negotiation with the apes about what it is precisely they mean by what they say. The linguistically improvising bonobos must check that their human addressees perceived and understood their utterances, and the humans must display their understanding to the bonobos so that the apes can either accept or reject it (vocally and/or by means of gestures). Here is a scene from the LRC documentary *Bonobo People*. Sue and Kanzi are out camping and it is time to leave the camp. Kanzi says PEACHES on the portable keyboard and begins to turn round, but Sue is not sure she understands what he means. Does he want peaches to eat, or perhaps to go to the location in the forest where there usually are peaches? When she starts asking questions, Kanzi halts and faces Sue. He listens attentively to her questions, and when she finally asks 'thinking about going to peaches?' he nods emphatically, turns around and begins the journey to the location in the forest that he had decided on going to. Kanzi also has another way of affirming interpretations of his keyboard utterances. He vocalizes *eee*, and sometimes he even says *yeah*, as discussed above (design feature 7).

Here is another example of a meaning negotiation, prompted by the difficulty of communicating new meanings on the keyboard (not captured on video). Panbanisha points to the lexigrams BREAD and CHEESE. What does she mean? The perceptive caregiver soon realizes that Panbanisha might have heard that there were fresh pizza slices in the trailer. She therefore asks, 'Do you want pizza?' Panbanisha vocalizes loudly, showing that pizza was what she asked for. There is no lexigram for pizza, so Panbanisha had to be innovative to express what she wanted, and the caregiver had to make sure she understood Panbanisha's intended meaning by asking her.

The bonobos respond appropriately to many different kinds of questions and requests pertaining to language. They answer questions of the form, 'What's this called?,' and very often of the form, 'Do you want to say something to Clara?' They also understand requests to repeat utterances or use specific linguistic media, such as when we say to them, 'Write it on the floor', or 'Try to say it again with your voice.'

When Nyota was three years old, Pär Segerdahl carried him in the forest according to Nyota's directions. Nyota pointed the way when Pär asked. When they approached one of the halting-places along the track, Pär asked, 'What's this place called then?' Since they did not carry a keyboard, Pär did not expect an answer. He just wanted to say something.

However, he felt that Nyota reacted and tried to climb out of his arms. Pär looked up and saw that Nyota placed his index finger on a printed sign, just above the entrance. It was a big version of the lexigram CRISS-CROSS. The bonobo Nyota taught the human Pär the name of the halting-place, when the human asked.

We mentioned that the bonobos check that their addressees perceive and understand what they say. Their index finger remains firmly on the lexigram until it becomes evident that the human to whom they speak has seen the gesture and understood it. Sometimes the bonobo looks up at the human interlocutor and waits for a visual indication of understanding. At other times the bonobo may just lie stubbornly in a corner and listen for a vocal indication that the human saw and understood the utterance. The moment the self-oriented humans say, 'oh, you want us to be quiet', the bonobo stops pointing to the lexigram QUIET. The bonobos also invent new names of persons and things. We discussed how Kanzi began to use PEAR as a personal name, but they also use the lexigram SHOE as the name of a visitor with strange looking shoes. The list of sometimes almost poetic improvisations of names and metaphors could be made long. A female visitor with an unusual hairstyle – it looked like an umbrella or the top of a mushroom – got the name MUSHROOM. These improvisations reveal awareness of a variety of aspects of language.

An impressive aspect of reflexivity was filmed by NHK, in *Kanzi, an Ape of Genius*. Tamuli was a bonobo who, for the purpose of comparison, was not initiated into language.[33] Savage-Rumbaugh asks Tamuli to slap, hug and groom Kanzi. When Tamuli does not understand, big brother Kanzi tries to teach her the meaning of words. When Sue asks Tamuli to slap Kanzi, and Tamuli does not react, Kanzi exemplifies what it means to slap someone by slapping Tamuli. He then moves back to give Tamuli a chance to reveal what she learned. When Sue asks Tamuli to hug Kanzi, and Tamuli does not respond, Kanzi demonstrates hugging by hugging Tamuli. He moves back to give Tamuli a chance to hug him. When Sue asks Tamuli to groom Kanzi, and Tamuli does not respond, Kanzi takes Tamuli's hand and places it under his chin. When Tamuli still does not groom Kanzi, Kanzi takes her hand and grooms it. Kanzi's very pedagogic teaching is unsuccessful, however, and a frustrated little Tamuli finally runs away, while Kanzi looks at her, gesturing, 'hey, don't run away, come back'. The deliberate manner in which Kanzi instructs Tamuli reflects very clearly that Kanzi not only comprehends and uses language, but also is aware of the fact that he has a form of language that other apes lack.

Let us recapitulate the aspects of reflexivity in the bonobos' language mentioned above. They were (i) negotiating meaning, (ii) understanding requests to repeat utterances or communicate in certain media, (iii) indicating desire to speak with a specific person, (iv) checking that the human addressee perceived an utterance, (v) creating new names, and (vi) teaching others the name of things and the meaning of words. Since the design feature of reflexivity occurs already in Hockett's catalogue, we do not discuss its presence in human language. Readers interested in the central roles played by reflexivity for the notion of human language are referred to Taylor (1992).

Flexible interface of primate interactions

Apes featured in commercials speak and act not only as humans, but often also as distinguished members of High Society. They may have refined taste and smoke cigars while describing eloquently why they have their butlers buy certain products. Why is the image of an ape speaking exquisite English so dizzying and profoundly comical at the same time? It is impossible not to look intently at the well-dressed ape and feel a bit giddy! Observe, however, that similar effects are achieved when children are dressed up as civil servants or business executives. Speaking cats, singing tomatoes and dancing biscuits do not make this deep impression on us, even though they might produce smiles. The latter images are too obviously nonsense, but the former ones are on the verge of being possible. What we see is possible and impossible at the same time, and we do not know what to think.

The similarity between apes and children in the example above is pertinent to our questions about language and its acquisition in infants. Apes and children who act as if they had high official status tease our imagination because we *visibly* have so much in common that the differences, and the importance we attach to them, might be felt undermined in embarrassing ways. Whether that feeling is legitimate is beside the point. The point is that there is something in the sheer image of apes and children that can make us react profoundly. A singing tomato in a TV-commercial does not make us embarrassed by any similarities to vegetables. We are human adults, different from children and apes, but at the same time we evidently have much in common with them, even though we normally do not stop and consider these commonalities. What is it that we already share with apes and children, and that is visible on the TV-screen, since they can make such a profound impression on us when they are dressed up as human adults?

People who have brought up apes in their homes report that during the first years it is almost like having one more child (Terrace 1979). There are important differences, but you can give an infant chimpanzee the same toys you give to a child and the chimpanzee will play with these toys basically as children do. You chase the chimp as you chase a child; you tickle her, pretend to bite her, frighten her, hug and comfort her and eat together with her very much as with a human child. You soon read the ape's reactions and feelings as easily as you read a child's, and the ape will read your feelings just as readily. It is easy to see that a young ape is afraid, that she is happy, disappointed, ashamed, eager to play, that she thinks, wants to be comforted, is happy to see an old friend, that she is tired, irritated, sad, puzzled, in pain, and so on. When young Kanzi was wounded, he showed his human caregivers where it hurt, and he even attended to human wounds (Savage-Rumbaugh, Shanker and Taylor 1998).

When not separated by a wire, then, the interface between humans and infant chimpanzees is almost as tightly woven as that between adults and human children. Our physiognomies appear to have a similar meaning, and even slight movements are recognizable and invite responses. Interaction comes naturally and requires no conscious effort: 'in the case of animals, particularly advanced ones such as monkeys or dogs, we do expect some kind or reaction from them. Have not all in fact experienced a response from their side? Though we recognize them as animals, our response to them is similar to our response to other humans' (Imanishi 2002: 6). We must not overstate the point, however, for the interface is, of course, generally greater between members of the same species. However, the interface between individuals varies greatly. In some cases the human-bonobo interface (for example, between Savage-Rumbaugh and Kanzi) is more tightly interlaced than some human-human interfaces. There is also the question of how profoundly members of different species and cultures form bonds between each other. Human ape owners might believe that apes are just entertaining pets to show distinguished guests. Such attitudes exaggerate the differences between species so profoundly that cultural boundaries begin to appear innate and insurmountable.

With Kanzi these obstacles were reduced to a minimum, and our interactions on the interface started a process that can serve as a model of human children's first-language acquisition. The interface turned out not to be rigid. It changed by our interactions and it gradually incorporated words, just as the interface between children and parents transforms during the first years of daily interaction:

> For example, the child makes a certain arm movement while the caregiver is saying, 'Do you want to be tickled?' Eventually sounds and words are introduced (e.g., the child says 'tickle'). The word 'tickle' is introduced in the context of and becomes an integrated part of the tickling routine. (Shanker 2001: 487)

TICKLE is one of the most frequently used lexigrams on the keyboard. Not only do the apes often ask to be tickled, the Pan/Homo interface is now in a state where they can ask a caregiver to tickle a third person (for example, a visitor). The intermediary Pan/Homo culture, as it emerged between Kanzi, Panbanisha and some humans, is the full-blown but still plastic interface of interaction between members of the culture. Interactions are sometimes more on the bonobo side of the Pan/Homo continuum and sometimes more on the human side. There is also an infant/adult continuum (interactions are sometimes more on the infant side of the continuum, and sometimes more on the adult side), and that is why we are talking about a *flexible* interface.

The unexpected experience of finding how plastic the ape/human interface is suggests a new possibility concerning the way human language is a natural possession. We do not need to speculate about innate linguistic knowledge. We can locate where language begins by observing the interface between adults and newborn children, which is facilitated by comparing this interface to that between humans and apes in the intermediary Pan/Homo culture. It is true that human children babble while infant chimpanzees are almost quiet. But first of all, this means that *babbling* is a natural tendency in humans, not that language is innate. And secondly, when parents interact vocally with their newborn children, making attractive sounds and saying things is just one aspect of the total interface of interaction. Parents touch their children while speaking, they put the finger under the chin and tickle them, and the children react not simply by giggling and making sounds, they also move the chin, close their eyes, raise their shoulders, and so on. Mothers who sing for their children usually do not simply produce fascinating sounds, they also dance with, carry, make rhythmic movements with or in front of the child, and different songs are typically associated with different ritualized patterns of movements (Merker 2002). Parents and infants play simple language-games together, they perform simple musicals where what is said and sung is connected with repeated action patterns. Mothers tend to maximize the interface and make it as rich and comprehensive as possible, given the child's immobility. Later, when the child begins to walk and move of her own accord,

these adult-conducted ritualized language-games are replaced by the activities of daily human life.

Remember that interaction is inevitable. Even a neglected child is fed, otherwise she dies, and feeding the child *is* interacting with her in many dimensions; these interactions gradually transform the interface. We are not explaining language development in terms of some idealized notion of mother-child interplay, although bad styles of interplay can have severe effects on the child's development, and good styles even cure language disabilities (see Shanker 2002).

Even though humans are clearly adapted for vocal speech (for example, even though human infants babble), our primal language develops only when the *entire* interface between adult and child develops: so that what we do with our voices can have the wider significance of spoken words. That is why first-language acquisition is so fundamentally different from second-language learning, and why apes can acquire human language even though they are not well adapted for human vocal speech, which is just *one* aspect of the entire interface. Other aspects of the interface (for example, hand gestures) can play the same or similar roles as vocal speech, in the context of the *entire* interface.

Let us return to Ludwig Wittgenstein, who questioned his own view in *Tractatus Logico-Philosophicus* (1922) that words function as a nomenclature of the elements of the world. He tried to imagine and describe many alternatives to the tempting idea that psychological words denote inner mental states:

> Here is one possibility: words are connected with the primitive, the natural, expressions of the sensation and used in their place. A child has hurt himself and he cries; and then adults talk to him and teach him exclamations and, later, sentences. They teach the child new pain-behaviour. (Wittgenstein 1953: 244)

We develop Wittgenstein's suggestion that psychological word usages are extensions of primitive reactions into an alternative to Chomsky's hypothesis of an innate language acquisition device (LAD). Language development starts long before the child starts to produce words, even before she starts to react with comprehension to words. It starts the first moment adult and child confront each other and react to each other's physiognomies. As a matter of fact, it seems that culture achieves its first effects already during pregnancy (Blum 1993). If the interface is shaped already before birth, then culture can be said to begin in the

womb (Savage-Rumbaugh, Fields and Taglialatela 2001). We replace Chomsky's LAD hypothesis with the notion of a flexible interface of primate interactions. Primates share a great number of similar reaction patterns and a similar physiognomy; that is, a plastic repertoire of subtle responses to the social environment enabling interaction to take place without conscious effort. These interaction patterns are not identical for all primates; they differ even between chimpanzees and bonobos. However, they are sufficiently related to make complex interaction possible, resulting in an interface that is not rigid but changes dramatically during the first years of daily interplay. The interface grows and becomes more tightly interlaced, and after a while there is an explosion in the infant's linguistic development, partly because a richer interface means more effective learning, and partly because the interface is prepared for the incorporation of words. In contrast to the speculative LAD hypothesis, every human who is together with a little child or infant ape will experience the existence of the flexible interface. It even plays a role in our reaction to apes and children in commercials.

You can hardly sit with a vacant expression on your face when an ape jumps up on your lap and wants to play. Interaction has already started. The difficulty is to see the relevance of this (seemingly simple) experience for the (seemingly enigmatic) problem of first-language acquisition. We experienced the flexible interface of primate interactions daily during more than two decades. First-language acquisition is not a mystery if it is studied with an eye to what we share with newborn children and apes even the first time we face them. A thousand physiognomic fishhooks connect adults with infants; we can hardly make a movement without catching fish. We are not even aware of doing it. Kanzi acquired far more language than Sue Savage-Rumbaugh originally thought was possible in an ape, and she confesses that the question of how he came to understand certain concepts often perplexes her, for she cannot remember having taught him what he evidently understands. As Stanley Cavell (1979: 177) remarks, 'we fail to recognize how (what it really means to say that) children learn language *from* us'.

Moral and personal dimension

Trying to prove that the bonobos have language when we constantly chat with them in order to organize the tests practicably can feel slightly ridiculous. For obvious reasons, no ape language critic has commented on this comical aspect of ape language research. It is no laughing matter, however, but a recurrent moral problem in our relations with the apes.

Each visitor wants a practical demonstration of the apes' language, and therefore we often have to treat the apes, in their own home, as if they were trained circus performers: 'Kanzi do this, Panbanisha do this.' It is part of the tragicomedy of ape language research that it is this understandable desire to see the apes' language demonstrated that creates the circus-like atmosphere that critics so much enjoy ridiculing. The reader already understands that this atmosphere has little to do with the personal relations we developed with the bonobos, and by which their language began to flourish. If anything resembles the spirit of the circus, it is the formal tests that sceptics demand, without a sense of the tragicomedy of the demand.

That the bonobos' language exists in personal and moral dimensions makes observing their language from a neutral position problematic. When Pär Segerdahl first visited the LRC, his desire was that of most of our visitors. He wanted to see the bonobos with his own eyes and decide for himself to what extent our claim that these apes have language was reasonable. However, during the first day of his visit, two events brought this to nothing.

The first event happened as follows. Early the first morning he is assigned to sit outside the apes' enclosed play yard. This enclosure is connected with the group room in the main building through a tunnel. The apes can move freely between the group room and the play yard by using this tunnel. This particular morning Panbanisha is lying on her blanket in the play yard while her two sons, Nyota and Nathan, run in and out the tunnel. Since it is the first day of his visit, Pär is told very clearly to just sit and observe. He is told this in front of the apes so that they will know that this stranger is under the control of a trusted human member of the Pan/Homo group and will not disturb them. However, while he is quietly sitting there, a previously employed caregiver comes to visit the apes, and she is looking for a keyboard to talk with Panbanisha. This new visitor makes Pär momentarily forget about the bonobos and his promise to just sit and observe. He stands up and begins to gesture and explain in broken English where she can find a keyboard. This tumult created by a visitor who should just sit and observe makes Panbanisha react. Disapprovingly she points to a lexigram on the keyboard she has inside the enclosure. Since Pär does not master the keyboard, he has to ask what Panbanisha is saying. Somewhat embarrassed, the visiting caregiver explains to Pär that Panbanisha is saying QUIET on the keyboard. The first thing Panbanisha says to Dr. Segerdahl, who in his capacity as philosopher of language travelled from Sweden to decide for himself whether the bonobos commu-

nicate linguistically, is that he should keep quiet! Pär is surprised by feelings of shame, sits down and continues to observe quietly.

Here is how the second event took place. After a while, Nyota and Nathan stop running through the tunnel and stay unobservable inside the group room. The trusted member of the group (Bill) returns and assigns Pär to Savage-Rumbaugh's office, where he can observe the two ape brothers through a large window facing the group room. Just below the window, through the wall, there is a plastic tube through which NHK runs cables when they make documentaries. Pär plays peek-a-boo with Nyota: they look at each other through window and tube alternately. Nyota then sends a pen through the tube, Pär sends it back and they continue to play like that for a while. Finally, little brother Nathan wants to participate, but he drives his entire arm through the tube. Pär watches Nathan's little hand stretched out into the office where he sits, and cannot resist the temptation to touch it. Nathan immediately withdraws his hand and runs out through the tunnel into the play yard to his mother Panbanisha. Given Pär's earlier experience, he now feels that he has done something wrong and that Panbanisha is going to know. It turns out he is right. After just a few seconds, Panbanisha bursts into the group room, carrying the keyboard in her left hand, almost as a weapon. Upset, she approaches the window behind which Pär sits and hits it with her right fist. She then places herself just below the window and puts her finger on one of the lexigrams. Bill, who is in the kitchen area, asks Panbanisha, 'Do you want to communicate with Pär?', to which she responds *eee*. Pär then searches for a keyboard in order to find out what Panbanisha says: he must read the English translation printed below the lexigram. This takes time, but Panbanisha patiently keeps her finger on the symbol. The moment Pär shouts to Bill, 'She is calling me a MONSTER!', she removes her finger from the keyboard. Pär is surprised a second time by how this ape managed to make him feel ashamed.

Pär's experience shows that his and most visitors' understandable desire to observe and decide whether the apes possess language has some problematic aspects. Language is not an inanimate object. It is unclear what it would mean to sit undisturbed outside an enclosure and decide objectively whether that object is inside. According to the apes, the observer is a person they can talk with (although he may occasionally be someone with whom they refuse to talk). The language Pär thought it was his duty to detect by careful observation was thrown straight into his face by an ape who used language simply the way language is used: to communicate with someone when you have some-

thing to say to that person. Panbanisha rebuked Pär in language when she thought he transgressed his role as newly introduced visitor. She did not accept that he babbled in front of her enclosure and she did not accept that he frightened her baby. Morally, then, there is no such thing as a neutral observer of the apes' language. The observer is a living being, and language is a form of communication between fellow-creatures. When an ape talks with someone who suffers from the illusion that he is 'an observer', because the ape has something to say to him, the observer can no longer play the role of distanced observer. He cannot both feel ashamed because he was just recently rebuked in dramatic language and treat the ape's language as an interesting hypothetical possibility. Pär's question whether Panbanisha had language was decided morally. Her way of acting towards him put Pär in a position where doubt became unthinkable. He was drawn into the drama of which he thought he was a spectator. This made it impossible to treat language hypothetically as a 'natural object'. Language exists through participation in the ongoing drama, and to talk and simultaneously see language as an uncertain hypothesis would be a joke. There are, therefore, occasions when persistently sceptical visitors have to turn their face away; otherwise, they would be drawn into interplay that would ridicule their stance.

When Savage-Rumbaugh discovered two decades ago that Kanzi had acquired language spontaneously, this too was a moral event. He broke into her life. He spoke to her in ways she had not experienced before. He sought eye contact. When he pointed to the CHASE lexigram and then ran away with a tantalizing look on his face, she simply put her self-imposed research duties aside. That is the secret of how her successful approach to language acquisition developed! Her moral experience of the young bonobo's language made it inevitable to question some of her previous ideas about what it means to study language scientifically. When Kanzi looked at her with an expression that showed that he meant something by pointing to symbols – that he spoke to her – she spontaneously turned towards him as a fellow-creature. Discovering his language coincided with this shift of attitude in her. Had he used symbols just to manipulate test objects according to the original formal expectations – as a well-behaved research subject of experimental psychology might do – she would probably not have reacted morally or seen Kanzi as a fellow-creature, because he would not have *spoken to her*. One might say that Kanzi contributed to instituting the LRC approach to language, since his way of addressing Sue called her back to the drama of language from a temporary excursion to experimental psychology.

Kanzi's language existed in face-to-face communication, and that was how Savage-Rumbaugh continued to interact with him. Anything else would have been unfaithful to her discovery, to him and to the humans around him. It is by being consistent on this point that Savage-Rumbaugh has achieved her most important results.

Talking with each other evidently has a moral and personal core. This was the axis around which Kanzi's language revolved and could be cultivated. The design feature under discussion adds an element to our understanding of culture. Cultures are not ethereal systems. They do not exist independently of unique individuals and their daily interplay. Talk about culture is empty if it is not put into personal practice. Culture is not, for instance, just a set of learning processes that can be studied experimentally in a laboratory, or a system of beliefs, values and norms that anthropologists hypothesize in foreign cultures, in order to make sense of strange ways of life. Students of cultures must be prepared to undergo further enculturation themselves. Understanding will develop as an aspect of immersion into new forms of life. Understanding will develop in proportion to motivation to develop new relationships with new persons in new circumstances; in proportion to the students' willingness to *change* their lives.

Cultural understanding is cultural transformation. Maybe that is why there sometimes is reluctance to understand foreign cultures. We may not want to become different. Treating Kanzi respectfully as an important fellow-creature meant giving him space to live as a bonobo in an intermediary environment with both Pan and Homo traits. Human culture could not be one-sidedly imposed on him, but a *new* culture had to emerge between Kanzi and some humans, where bonobo and human forms of life were blended. That apes and humans at the LRC have become bicultural and act on a Pan/Homo continuum is therefore an aspect of the design feature under discussion. In retrospect it is easy to say that Savage-Rumbaugh's early experience of being invited by Kanzi to play, or Segerdahl's of being rebuked by Panbanisha, ought not to have surprised us. The idea of studying language in great apes without expecting that the apes would speak directly to us and even rebuke us reveals how tremendously difficult it is to remember the most distinctive features of language: they are too close and too obvious.

The remarkable fact that we are researchers who achieve our best results morally creates an occasionally frustrating situation. Contemporary science is a professionalized and institutionalized business. Whatever results one achieves, one is supposed to achieve them in a purely professional function as researcher, not in the more natural

capacity as complete human being with a scientific schooling. The lofty ideal of scientific objectivity is often indistinguishable from this industrious tendency. We have, in our research, exploited what we are as human beings. We have done so partly because we experienced this as the only way of cultivating language in the bonobos, and partly because it was the only way we could treat Kanzi when he began to speak to us. Terrace, however, held fast to his decision to study ape language in his purely professional capacity as experimental psychologist. This was the all-embracing ambition that governed his way of approaching Nim. His ultimate loyalty was to his science, and language was therefore a scientific phenomenon for Terrace. But we experience language as a personal phenomenon. Only in the second place, when it comes to testing and reporting what we achieved in a different spirit, do we treat language as a scientific phenomenon. This is our daily but slightly schizophrenic practice.

As we try to show in this book, however, the language we tested and reported – in our capacity as 'good scientists' – was not the language Kanzi actually acquired by sharing life with humans. The bonobos' language has been underreported. The daily linguistic dramas have been invisible. The catalogue of design features is an attempt at a new kind of communication of our work. We have written this catalogue not primarily in our capacity as 'pure' professionals, but in our capacity as thinking persons with a scientific schooling. That is also how we address the reader: not as an expert in linguistics, psychology, sociology, anthropology, biology or other field of research, but as a thinking person with a scientific schooling. By speaking in a personal voice, by writing with a moral striving for truthfulness towards what we experience, we are, in some sense, trying to achieve the same change in the reader's personal understanding of linguistic phenomena as Kanzi and Panbanisha achieved in us.

Commenting on the ideal of scientific objectivity, William James once remarked that

> the rigorously impersonal view of science might one day appear as having been a temporarily useful eccentricity rather than the definitively triumphant position which the sectarian scientist at present so confidently announces it to be. (James 1991: 378–9, n 8)

The day the rigorously impersonal view of science appeared to us as an inhibiting eccentricity came when Kanzi showed that he developed language without training. We had no choice then but to put aside the

impersonal laboratory ideal of scientific objectivity, since it obviously was not in harmony with what we wanted to study, or with the fellow-creature we discovered. But how is this possible? Did we fail to report the most important aspects of Kanzi's language in our earlier studies because we tried too hard to be good scientists? Was Terrace less successful than we were because he tried even harder to be a good scientist? Have all of us misunderstood the place of science in human life? It seems we must now turn to another discussion. Against the backdrop of the above catalogue of design features of language, we will reflect philosophically on a certain ambiguity in us humans as cultural beings. This ambiguity tends to make it difficult both to perceive language, science and human existence in their cultural dimensions, and to see the function of philosophizing in culture.

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3
Ambiguous Human Culture

'No one dares to show his person, but masks himself as an educated man, as a scholar, a poet, a politician.'

Friedrich Nietzsche

Philosophy and scientific specialization

Deeply unexpected discoveries often reveal an equally unexpected ignorance. We may not know what we ourselves have discovered, especially not in our professional capacity, for the new experiences can take us beyond our scientific training and how we commonly conceptualize results in relevant fields of inquiry. These unexpected discoveries are often the most exciting ones, but they tend to make scientific work almost indistinguishable, at least for a period of time, from philosophical thinking. The revealed lack of clarity about the concepts that normally are used to make sense of the data often awakens the philosopher inside the professional scientist. This awakened philosopher is not an expert thinker, but a dazed human being, who faces the challenging fact that she cannot always trust her professional skill. She has the desire to think through, in her own self-made way, what she has experienced, for the manual has become untrustworthy. Philosophical thinking tends to be homespun. It arises when the more elaborate guidelines fail and we trust nothing except what we can achieve by thinking of our own accord. To the extent that professional philosophy exists, philosophy in its most original form arises when the professional doubts the veracity of her reasoning habits, the concepts she uses as if they were self-evident, her almost automatic way of writing articles, her habitual way of teaching and arguing, perhaps even her way of greeting colleagues: everything belonging to the academic culture to which she has adapted

herself. Philosophy renews whatever it touches, and above all it renews itself. It turns the searchlight towards ourselves and our conception of the things that started a rebellion against our ideas. Occasionally, everyone becomes a philosopher, regardless of her profession.

If we are right, then Kanzi's language acquisition is the kind of unexpected discovery that cannot be reported simply as one further body of empirical facts within a well-established notion of language. His language acquisition, especially when compared with the case of Nim, speaks against widespread and seemingly self-evident ideas about language. We tried for many years to test and report Kanzi's mastery of language according to standard notions of language, but we thereby failed to be faithful to how he actually acquired and used language. What we really needed was a philosophical transition to a new way of studying language in nonhuman primates, and perhaps also in ourselves. We needed to investigate the conceptual framework for talking about language as it is acquired the first time. Only in the context of such a philosophical reconsideration of language could we report what actually happened. This procedure gave the previous chapters a slightly ambiguous character that probably is inevitable. They seem to waver between an empirical study and a philosophical inquiry. On the one hand, new facts are reported: we did not know these humanlike qualities could emerge spontaneously in nonhuman primates. On the other hand, a new understanding of the facts emerges: we did not expect that the connection to culture would provide the relevant *sense* in which an ape can acquire language. Hence, a twofold surprise evolves: both empirical and conceptual. A third surprise, however, is this: we apparently have failed to understand language even in our own species. We were not fully aware that this was the relevant sense in which *we* acquire language the first time: the sense of the twelve design features of language. Ape language research 'is engaged in both a conceptual and an empirical investigation', Shanker (1994: 59) remarks.

Kanzi's unexpected journey in a human direction becomes an occasion to reconsider our self-understanding. Biology classifies us as primates. Desmond Morris, who wrote *The Naked Ape* (1967), used this classification as a motivation for a literary genre where the basic rule was to describe humans in the same style zoologists describe animals. But Morris evidently did not suspect that nature could be as humanlike as Kanzi is. His aims were, we believe, to a great extent ideological. He wanted to, or so it seems to us, expand his specialized perspective as a trained zoologist to the human domain. But such an expansion requires an enormous amount of philosophical and scientific work. His aims, it

seems to us, made him blind to the biological relevance of our human qualities. If we are classified as animals, then surely one can argue that our existence gives zoologists a reason to reconsider what it means to be an animal, just as Kanzi's existence gives humanists a reason to reconsider what it means to be a speaking being (biology is unreasonably neglected in the humanities). But Morris made the reader believe that zoologists already knew perfectly well what it means to be an animal. Since humans are animals, we have to face the fact that we are animals in this zoological sense, and humbly accept to be described in the terms of this discipline. Although Morris' book communicates many truths, the overall result was a literary style that expresses a political position concerning the weight of zoology for human self-understanding. Morris' book does not strike us as the fruit of open-minded research in a new domain. But we hope that we have done some of the work that a truthful zoological approach to human nature would require. It is not easy to describe human existence in a biologically relevant manner without therewith imposing zoological perspectives that hide or distort important human traits. And here is where Kanzi enters the picture. If the culture we already have as humans can have the effect it had on Kanzi, then this primal culture has biological significance without being re-described in the style that trained zoologists use when they describe animals. This, we believe, belongs to what it means to take it seriously that we are primates. If we can learn to describe those aspects of our culture that affected Kanzi, then that description could be seen as a description of the life of the human animal.

This brings us to the fourth and final unexpected feature of what we have attempted to communicate so far. For even though Kanzi's metamorphosis reveals neglected cultural dimensions of our own human language, it so happens that the twelve design features do not provide us with absolutely unheard of information about language. The sense in which we were ignorant of them was not the sense in which we may be ignorant of the contents of a sealed box, but rather the sense in which we may fail to give a correct road description, even though we drive it almost every day. The twelve design features of language tell us what we, in some sense, knew all along, or at least were acquainted with in practical life. They are communicated to the reader not in the authoritative style an expert informs the ignorant about novel facts (compare how an historian may *inform* the reader about habits in ancient Rome), but the way equals may try to remind themselves of what they know together already, but fail to remember adequately. In the words of the historian, archeologist and philosopher R. G. Collingwood:

> In philosophy . . . no concept can ever come to us as an absolute novelty; we can only come to know better what to some extent we knew already. We therefore never need an absolutely new word for an absolutely new thing. But we do constantly need relatively new words for relatively new things: words which indicate the new aspects, new distinctions, new connexions which thought brings to light in a familiar subject-matter; and even these are not so much new to us as hitherto imperfectly apprehended. (Collingwood 1933: 205–6)

Collingwood expresses the philosophical spirit in which we use relatively new words, such as 'enculturation,' 'spontaneity' and 'immanence': not as technical terms requiring novel definitions, but as effective words for communicating neglected aspects, distinctions and connections in a perfectly familiar subject-matter (our forms of life). Seeing language develop in apes is an unusual experience. Through its strangeness, it stimulates recollection of forms of human life that are so self-evidently general and basic that they escape our attention when they appear in us, where we find them every day. In philosophy, 'when we discover a new truth we recognize it as something which we have always known', Collingwood (1933: 106) remarks. Kanzi helps us discover such philosophical truths about ourselves. His life history – expected in humans but unexpected in apes – helps us see that we have a biologically active culture in our capacity as humans. For it was this, for us humans self-evident and therefore unnoticed, culture that affected Kanzi, not the specialized culture of experimental psychology.

The catalogue of design features of language provides the kind of foundation we need, precisely because it is not a technical definition, but organizes already known facts. The catalogue connects the data with the culture that achieved them, and in which Kanzi acts when he communicates. One could say that we, when we composed the catalogue, acted as philosophical gardeners in our badly looked after human experience. We dug twelve furrows in the ground, for the purpose of making it easier to remember and survey, in one single overview, the relevant facts in the landscape of language. Faith in information derived from empirical research often makes us overlook what we already know as humans, but unexpected discoveries can create a desire to find guidance in this more general domain of human experience. So, although the catalogue of design features does not go far beyond what everyone can testify to by providing examples from life as one lives it oneself and can talk about it, it is highly relevant for the scientific understanding of lan-

guage. Reminders expressed in common language can revitalize the research and disturb the exaggerated and often scientifically counterproductive spirit of professional specialization.

When we found that the question if Kanzi has language was not just a 'purely scientific' issue that could be treated hypothetically in a formal test situation, whatever that means, but first of all a moral and personal question that answered itself categorically in his presence, we could not treat Kanzi and the other bonobos merely as material for further research. They drew us into the drama of which we thought we should be observers. The big question is whether this unexpected personal character of our work makes it less rooted in the real world than are normal studies of animal behaviour, where experimenters act primarily in their professional functions. Do we have the attitude that Kanzi has language, but fail, because we are personally too attached to him, to investigate the hard empirical question whether he does in fact have language? The lesson we have learned is that had we not allowed this personal dimension to flourish in the research, had we not allowed ourselves to be drawn into the drama, we would not have achieved what we achieved. If language is an aspect of how humans live together, then we must not exaggerate the spirit of professional specialization in our work, since it would prevent the aspects of culture that harbour language from entering the laboratory. In order to cultivate language in the bonobos, we cannot act as clever experimenters all the time, but only occasionally, and we have to ask the apes for permission to test them: not only to be polite, but also because it is in asking for permission, and similar forms of interaction, that language exists. The moral relation to the apes must be the overriding factor of the work, its first principle, which means that the apes are allowed to affect us, just as we affect them: the emerging Pan/Homo culture is an intermediary form of life. Otherwise, there would be no talking with each other. By acting respectfully (and occasionally disrespectfully) towards the apes, as humans do towards each other, we bring into our interactions precisely the linguistically relevant aspects of our human ways of life. Kanzi demonstrates that nature responds to this respectfulness. With regard to many animals, and certainly with regard to the great apes, moral bonds function as links to the reality we observe in studying language.

Let us summarize how we consider our work and its reception. We have, in our research practices, carefully balanced the specialized scientific techniques that we learned as university students against the more general aspects of human life that we developed during childhood immaturity. Counterproductive demands on what it means to do sci-

entific research and report results have made it almost impossible to communicate what happened at the LRC (or in Project Nim, as we shall see later in this chapter). Therefore, this unusual event has not been allowed to work as a sufficient reason to change the way sciences such as linguistics, psychology and biology understand their objects of study. We humans have a culture originating in early childhood, and Kanzi demonstrates the biological significance of these primal aspects of human life, how they can affect a young animal and thereby nature. Drawing on our sensibilities as members of this culture is not to impose human artefacts on nature, but to carefully explore the apes and ourselves as primates, and how culture blends with biological life. Genuine science arises when scientific techniques are allowed to invigorate the human mind; not when they paralyze the imagination. This chapter is devoted to the difficulty of understanding this point.

Is Kanzi a real animal?

We will now respond to some of the most important objections, questions and worries to which our work tends to give rise. The first question concerns the extent to which our results are biologically relevant. Is Kanzi a good model of nature? Is the intermediary Pan/Homo culture a relevant example of what it can be like for an animal to have culture? Or have his contacts with humans contaminated him with qualities that do not properly belong to his species?

A primatologist who has contributed enormously to challenging the traditional dichotomy between culture and nature, and who has argued forcefully for the existence of cultures in other primate species, is Frans de Waal. In a stimulating and thought-provoking book, *The Ape and the Sushi Master* (2001), he questions the notion of *Homo sapiens* as the only cultural species. His manner of doing so is different from ours, which we welcome, since the dichotomy between culture and nature – with us on the cultural side and the animals on the natural – is so deeply rooted in us that only questioning from several perspectives reveals how hollow it is. De Waal's discussion is different from ours in that he is careful to select and discuss examples of cultures that the animals develop in their natural habitats, or at least among themselves. Within such an approach to animal culture, Kanzi is, of course, not a model to consider or learn from, since his way of life developed in interactions with humans. But, surely, nothing in Kanzi's upbringing prevents him from being a further model of what it can mean for an animal to have culture?

De Waal begins his book with featuring Jo Mendi, a popular chimpanzee in the 1930s who was trained to entertain humans wearing clothes, smoking cigars and drinking brandy: the kind of case we discussed when introducing the eleventh design feature, the flexible interface of primate interactions. De Waal remarks that the reason 'we select apes for this job is logical because it is particularly in the face of animals similar to us that human uniqueness needs confirmation' (2001: 4). Because these funny apes stumble upon the cultural garments we force them into – spilling tea all over the sofa – they serve to confirm our view of ourselves as the only *proper* example of a cultured being:

> We define ourselves as the only cultured species, and we generally believe that culture has permitted us to break away from nature. We are wont to say that culture is what makes us human. The sight of apes with wigs and sunglasses acting as if they have made the same step is therefore utterly incongruous. But what if apes have made this step to cultured behavior not only for the entertainment of the human masses, but also in real life without our assistance? What if they have their *own* culture rather than a superficially imposed human version? They might not be so amusing anymore. Indeed, even to contemplate such a possibility is bound to shake centuries-old convictions. (de Waal 2001: 5–6)

We share de Waal's reaction and appreciate his reasoning. However, we wonder what is meant by 'real life' and 'their *own* culture' in the second part of the quotation. One could interpret these terms simply to mean that animals, as a matter of fact, have developed cultures without interacting with humans, which certainly is an important part of what de Waal wants to say and something we wholeheartedly support. But is there also a normative claim involved in the distinction between real and unreal forms of life? On what grounds is de Waal making his distinctions, and how would he impose them on our enculturated bonobos? Why is he so careful to select examples the way he does? Are animals with Kanzi's history, perhaps, ruled out as relevant models of animals with 'their own' cultures? Would enculturated apes, perhaps, be considered no more than advanced Jo Mendis, albeit not trained as entertainers: tame animals on which we have forced a cultural outfit that their biological bodies are not built to wear? Our question, then, is whether the Pan/Homo culture, according to de Waal's distinctions, is a 'real' animal culture, or only a 'superficially imposed human version'.

Ethology can be viewed as a version of human culture: as a scholarly culture with its own history, its own tools and practices, its own vocabulary and literature, its own gatherings around its objects of study, its own ways of responding to the world and distinguishing between what is beautiful and ugly, good and bad, real and unreal. De Waal's personally written book can be read as a memoir by an active and distinguished member of this culture, revealing aspects of how one thinks, perceives and evaluates in the most vital strata of the culture. What happens when this scientific culture is imposed on Kanzi? What does he look like from *its* perspective?

Kanzi is not mentioned in de Waal's book. Why is such a remarkable case as Kanzi's enculturation not mentioned in a broad survey of animal cultures? The omission might, of course, be purely coincidental. But it may also have to do with the normative aspect we suspected was an element of de Waal's distinctions. In another book, *Bonobo: the Forgotten Ape* (1997), de Waal does express his attitude to our research:

> Personally, I must admit to mixed feelings about ape language research. On the one hand, I see it as a thoroughly anthropocentric enterprise. A communication system for which evolution has specifically hardwired us (and perhaps only us: our brains are three times larger than the average ape brain) is being imposed upon another creature to see how far it can go. There is something inherently unfair about judging them on our terms. Might we not learn more about them by scrutinizing their own communication systems, such as their hand gestures or vocalizations? On the other hand, the apes in these studies are so well attuned to people, so willing to interact, so used to the way we relate to our surroundings, that all sorts of questions can be addressed that are impossible to answer with apes who view us as strangers with strange habits. As such, this kind of research opens up an important window on the ape mind. It allows us to explain to them what we want and to ask them how they perceive things. Kanzi's flint-making is an example of an experiment that might not have worked with an untrained subject. (de Waal and Lanting 1997: 44)

This extract reveals the image of Kanzi and the Pan/Homo culture in the eyes of a first-rate ethologist who is open to the idea of culture in animals. We immediately note that the distinction reappears between the animals' 'own' facilities and superficially 'imposed' human versions. In the more positive evaluation of ape language research, in the latter

half of the quotation, de Waal tends towards describing enculturated apes simply as tame animals. They are depicted as 'well attuned to people', 'willing to interact' and 'used to the way we relate to our surroundings', as if no profound transformation had occurred in them. But, is not a central aspect of culture, precisely, relating to each other and to our surroundings in characteristic ways during continuous interaction? Are not enculturated apes' ways of life, together with humans, *further* examples of animal culture?

The extract ends with a barely concealed contradiction: a contradiction that one finds in almost every attempt to comment on enculturated apes. Later, we will discuss a version of this contradiction in the work of the psychologist Michael Tomasello. What is the contradiction? It is that human language, on the one hand, is described as uniquely human, and on the other as something that 'allows us to explain to them what we want and to ask them how they perceive things'. How on earth is the latter achievement possible, if language is 'a communication system for which evolution has specifically hardwired us'? Have we counterbalanced the lack of innate hardwiring for language in ape brains by hard training, as might be implied by de Waal's opposing Kanzi with what he calls 'untrained subjects'? But Kanzi acquired language spontaneously and boundlessly!

It appears, then, that de Waal sometimes imposes normative distinctions that lure him into contradictions and into judging the facts unjustly, exaggerating some examples as the only proper examples, and downplaying others as not even belonging to 'real' life. Why is de Waal, sometimes, imposing these ill-fated normative distinctions? It appears, paradoxically, as if he, occasionally, relapsed into a version of the culture–nature or human–animal dichotomy. Why? Perhaps because he is combating other scholarly traditions, other scientific cultures, such as experimental psychology, with their ways of looking at animal behaviour. Experimental psychology developed in America and focuses on animal behaviour under specially designed laboratory conditions, while ethology has European origin and studies how animals behave in more natural environments. We believe that de Waal, in this overheated situation, has misunderstood our work with enculturated apes. Here is what he thinks we think:

> They consider these apes *enculturated*, meaning that the enriching, stimulating context of the human environment has brought out capacities that these animals normally don't have. By claiming that apes can't imitate unless they have benefited from humanity's

> shining light, they leave the human–ape divide intact. (de Waal 2001: 223)

Because he thinks we are stuck in the old dichotomy, overemphasizing the human side as if we thought that animals could imitate and develop culture only by being raised by humans, he needs a variant of the dichotomy. He needs to distinguish between natural and unnatural animal cultures (although he does not use those terms). Animals develop the natural cultures of their own accord. The unnatural ones arise in our human world, because some of us think that we are superior, due to our unique culture, and either want to laugh at apes such as Jo Mendi who make a fool of themselves in a culture they cannot adopt, or else want to help apes such as Kanzi to a more humane life in this superior culture. Such a Kanzi would not be a real animal, of interest to biology, but a bizarre result of human presumption.

It may come as a surprise, but we share de Waal's antipathies, and when he lays down his arms – the distinction between natural and unnatural animal cultures – we could not agree more heartily with him. Look at his explanation of why apes respond so swiftly to human culture:

> Any sensible theory will, in my opinion, propose that they are sensitive to human enculturation precisely because cultural influences abound in their natural environment. They are educable because they need to be. If so, the enculturation idea supports rather than contradicts the possibility of ape culture. (de Waal 2001: 233–4)

Precisely, enculturated apes support the notion of ape cultures in the wild and indicate that cultural influences abound in the apes' natural environment. Add to this explanation the fact that we ourselves are primates, and that our culture, as it develops in childhood, to an underestimated extent is a primate culture – the kind of thing one learns by using Kanzi as a model – and the explanation becomes even more convincing. What apes acquire by being raised in human culture is not alien to what they are as primates. The 'window on the ape mind' that de Waal suggested language might open, that window turns out to have been open all along: it is the flexible interface of primate interactions. The most effective way of noticing that the 'window on the ape mind' is open is by interacting with apes. Observe that we are speaking here of interacting with apes who already happen to be living in exceptional conditions among humans. We are not suggesting that humans should

start interacting with wild apes. Such attempts to interact would normally be insensitive to the apes' own ways of life and could cause uncontrollable harm, just as when we interfere with human cultures. We understand why many field-working ethologists wonder what ape language research is about, since they take responsibility for how they do science by avoiding close contacts with the animals. Interaction is taboo. We are working under other conditions, taking a different but equally natural moral responsibility for how we do science under these different conditions. In the situations in which we find ourselves daily, it would be insensitive not to look the ape in the face. We have opposite moralities because the conditions of research are different. Maybe this clash between scientific cultures is the real reason why de Waal has mixed feelings about ape language research. What we do for him is taboo. Another person's morality may seem incomprehensible simply because we are not familiar with the daily conditions under which it developed and functions naturally.

Since we admire de Waal's work – he is just the kind of person we would like to convince – we continue the discussion of his ideas. When de Waal had laid down his arms, in the most recent quotation, and explains that apes 'are educable because they need to be', we believe he contradicts one of his previous statements, made in panoply:

> rather than having been lifted to unprecedented cognitive levels, apes raised by people have become ideal test subjects simply because they are willing to pay attention to psychologists. (de Waal 224)

What is the contradiction? It is that apes, on the one hand, easily learn new skills because they need to, but do not acquire important new forms of behaviour by contacts with humans, on the other. Enculturated apes have merely become tame, de Waal seems to say, and easier to handle for humans. But why on earth should apes, if educable and similar to us, not be, in some sense, 'lifted to unprecedented cognitive levels', when they are initiated into human cultural contexts and begin to act there (which does not exclude that they, in other respects, become less clever than apes that are enculturated in the wild)? The design feature of placement means that Kanzi's language in certain respects is more powerful than Nim's. Recall Kanzi's response to 'give me the ball that's outdoors'. On this point, our notion of culture as a powerful dimension of primate cognition has much in common with Merlin Donald's (2001) ideas, even though we question his notion of culture as uniquely human. For what is the point of the cultural sensitivity of the primates,

especially during their long childhood, if what they acquire does not lift them to 'unprecedented cognitive levels'? Human children certainly acquire more powerful cognitive abilities when they grow up and become more deeply enculturated in our culture, and so do wild bonobos when they grow up and become enculturated in bonobo rainforest culture.

There is, however, an element in de Waal's statement that we find congenial, and that goes against the intellectualism of many cognitivists. It is his aversion to the idea that the human mind is more powerful than the ape mind by being more abstract, by being more detached from the world of action, by being almost literally 'lifted to unprecedented cognitive levels' through a prestigious journey across some strange river – a mental Rubicon – evidently freeing us humans from the bonds of nature. Our aim with interpreting Hockett's design feature of displacement on the basis of our own design feature of placement was to show how superficial this intellectualism is, and how little it manages to make sense of what it is that makes human forms of behaviour powerful. It is the very opposite of detached mental life, and rather immersion into mobile forms of life where we speak while travelling (and before, and after). We had the same purpose with interpreting René Descartes' notion of reason in terms of immanence, and the arbitrariness of the linguistic sign on the basis of the non-arbitrary (but not fated) uses of signs in cultural practices in which primates find themselves at home. The human mind of detached mental representations is, perhaps, only a well-meant mythology. When we consider the commonplace details of how detachment arises in the bonobos' communications – for example, how talk about locations far away in the forest draws on the simple fact that we regularly travel to these places while talking – detachment appears to be an effect of placement. Detachment is made possible by attachment: by attachment to mobile ways of life. It is not an abstract capacity of the mind that enables this ability to discuss and plan where to go in the future.

We now turn to an intellectualism to which even de Waal sometimes succumbs: that of viewing our first language as if it were a form of writing in thin air, as if it were one of the second languages we learn in school. In the quotation where de Waal expresses his suspicion that ape language research is an anthropocentric enterprise, he describes human language as 'a communication system for which evolution has specifically hardwired us'. What is de Waal's notion of this special communication system? By describing it as 'a system' he conceptualizes it as a delimited structure rather than as boundless. Language is presented as

a separate instrument rather than as interlaced with virtually all functions of human life. Its unity is supposed to be that of vocabulary and grammar, and not that of culture (such as the Pan/Homo culture). And by describing us as 'hardwired' for this system he subscribes to a Chomskyan understanding of language, an intellectualism if ever there was one (this will become clearer in Chapter 4).

We will examine de Waal's notion of language socratically, acting as midwives trying to help forth what we admire as his best ideas. It seems to us that his intellectualist notion of language is contradicted by more fruitful ideas about concept-formation in biology, ideas that he puts forward in the following three passages:

1. All the fancy things that humans do with tools and culture are certainly worthy of attention, but they are best kept out of initial definitions so as to cast the net as widely as possible. This approach is commonplace in biology. (de Waal 2001: 26)

De Waal here recommends a way of proceeding that we followed all along in this book. We tried to avoid defining our initial language on the narrow basis of what we do later in life, with pencil and paper, when we already speak in the labyrinthine situations of human life:

2. Broad definitions have the additional advantage that they permit us to see the full range of a phenomenon. For example, one could define language so narrowly that the babbling of a toddler does not fall under it, but does this mean that babbling has nothing to do with language? Narrow definitions neglect boundary phenomena and precursors, and they often mistake the tip of the iceberg for the whole. (de Waal 2001: 26)

In this instructive statement, de Waal applies his ideas about concept-formation to the definition of language and arrives at a biological justification of our broad catalogue of design features of language. The difference, perhaps, is that we do not see our catalogue as a novel definition of language, but as a survey of what we already know about language in practice; a familiarity with our human primal language which the experience of seeing language emerge in Kanzi helped us notice and describe.

The above quotations reaffirm that philosophy, in its most original form, is not a profession, and that, occasionally, everyone becomes a philosopher:

3. Imagine that we were to define 'eating' by the use of knife and fork. Such a definition would allow us to claim eating as uniquely human, even uniquely Western, yet we would accomplish this distinction by confusing the instruments of consumption with its essence. (de Waal 2001: 30)

A fine remark that brings to mind this advice by Wittgenstein: 'Being acquainted with many languages prevents us from taking quite seriously a philosophy which is laid down in the forms of any one' (Wittgenstein 1981: 323). De Waal's philosophical remark is analogous to our own view of the definition of language as grammar. This definition confuses not merely a natural instrument of linguistic communication with its essence, but even the erudite bureaucracy of an invented instrument that we laboriously learned to master after we began to speak: the grammar of written signs. Talk about putting the cart before the horse! There is a lot to learn about our own species by seeing Kanzi as a real animal and the Pan/Homo culture as a true animal culture!

Our conclusion is that it is mainly a deadlock in the communication between specialized scientific cultures (for example, ethology and experimental psychology) and more primordial and difficult to survey aspects of human life that stands in the way of seeing Kanzi as a real animal, and the Pan/Homo culture as a further example of the cultural facilities in other primates. Enculturated apes undermine the culture–nature and human–animal dichotomies from a new angle. The strangeness of finding human qualities in apes helps us to notice their natural presence in us. They become more conspicuous when they appear where we do not expect them. Kanzi makes it possible to think of ourselves as animals in a way that does not force us to repress what we think of as our specifically human qualities, as Morris' ideological notion of the naked ape forces the reader to subordinate their self-understanding to a zoological notion of animal life. It is not a question of imposing zoological descriptions on human life, but of rediscovering aspects of the culture we already have and that are so general and basic that they often escape our attention (our primal culture). Not only is there continuity between us and the other primates, the continuum is flexible. Humans and apes affect each other as adults affect children. The continuum can be contracted or stretched out, depending on how we manage to act together (or fail to interact). This indicates that distinct primate species are less distinct than they usually are assumed to be, and that the boundaries between species are changeable. The ideal of studying animals at a discreet distance can create false idealizations of animal

behaviour as entirely natural or automatic phenomena, in a sense that excludes culture.

We are not engaged in an ideological fight against biology, or using the term 'culture' as an ideological weapon. Rather, we emphasize that culture can be seen as a force that affects biological organisms during ontogeny, challenging their genomes to become involved in their development in a variety of new ways. Aspects of enculturation might in the future be studied by biologists in many fields, from evolutionary biology and ethology to molecular biology, neurobiology and genetics.

Is ape language research anthropocentric?

We admit that Frans de Waal's suspicion that ape language research is 'a thoroughly anthropocentric enterprise' is not unfounded. There have been clear anthropocentric tendencies in most attempts to teach apes language. Nim was expected to sit in a chair, to eat with a spoon, and to wipe his face and his chair when finished (Terrace 1979: 51). Such tendencies can be found also in our work, but our best results appeared when we managed to avoid them, and generally to the extent that we took seriously how difficult it is to avoid being anthropocentric. For what is anthropocentrism in connection with the human–animal divide? Is it not the natural tendency to take our best-known human standards for granted and to impose them on the animals, simply because they are *our* standards, the ones *we* use? For instance, we naturally assume we know what language is, at least in our own species, and ask if apes can learn language in this sense. What could be more natural? The ape language advocate believes that apes can learn language, but the sceptic thinks that this is over-interpreting the data and seeing language where there is none: that it is a case of an error called anthropomorphism (projecting human terms on nonhuman realities).[34] But if the very posing of the question presupposes the imposed human standard, does it not follow that the ape language advocate and the sceptic are equally anthropocentric? They both take it for granted that we already know what language is in our own species and ask if apes can acquire language in this sense. Is it not this unique human standard that de Waal himself uses, as if it were unassailable, when he expresses his suspicion that ape language research is anthropocentric? Is his notion that 'there is something inherently unfair about judging them on our terms' itself based on an almost irresistible form of anthropocentrism? What if his notion of 'our terms' can be questioned? What if a closer study of the animals could overturn our taken-for-granted standards, even in

their application to us? If so, then it is not wise to follow this advice without precaution:

> Instead of urging the social sciences and humanities to absorb more biology, I am asking them to carefully reconsider their chosen domain – often defined in opposition to biology – and see how broadly it applies. They can export their ideas to students of animal behavior, who will agree that the social environment directs development, and that each individual is part of a larger whole in both body and mind: the group, troop, colony, flock, or community. (de Waal 2001: 29)

If we were right in admiring de Waal's remarks about concept-formation in biology, then one cannot broaden the domain on which the concepts of the social sciences and humanities are applied without first asking how these concepts were defined. Normally, the aims of concept-formation are different in the humanities from in biology. Biologists often define concepts broadly, because their aim is to trace how evolution solved the same functional task in different species: it may concern reproduction, nutrition, predator avoidance or locomotion (de Waal 2001: 26). But the social sciences and humanities are normally not interested in making comparisons between many species.[35] They are concerned with aspects of life as it is lived by one particular species, and these aspects are often selected according to their relevance for maintaining the societies this species has developed. The concepts of the humanities are therefore typically defined more narrowly, often circumscribing socially administered human instruments, so as to have practical utility for responsible individuals and institutions. Parents, teachers and officials at the ministry of education normally have no use for a faithful but labyrinthine description of language as it is acquired in childhood, for that takes care of itself. But they may need to be able to discuss language as it can be taught to new generations (who already can speak) within the educational system, for that is a both reasonable and manageable responsibility. Responsible individuals in human societies need tools to control the constructed vessels that we send out on the ocean of our more spontaneously developed primal culture. The humanistic aims of concept-formation are important, but they often differ from the broader aims of evolutionary biology. The lexicon and the grammar book, orthography and pronunciation: these are obvious standards of language for responsible humans who do not have to think about how to make infants speak in the situations of human life, but

who do have to consider and plan, very seriously, the education of children who already speak. It is only natural that language appears uniquely human when the animals are judged on sophisticated humanistic terms, but are the humanistic terms our most fundamental human terms?

A problematic tendency in the otherwise commendable attempts in early human sociobiology to overcome anthropocentrism was that one often retained the humanistic concepts of human traits and merely imagined that these traits – *thus defined* – had an evolutionary history and a genetic basis. But simply imagining an evolutionary history and a genetic basis for human traits is not sufficient, if the intellectual concepts of the traits have a thoroughly anthropocentric history and basis, for instance, in the human sciences. Rather than overcoming anthropocentrism, then, early sociobiologists often just updated it in the terms of evolutionary theory and genetics. To actually explore the evolution and genetics of human traits, it is necessary to first re-think our often idealized concepts of the traits, such as language, and unravel their most primordial forms of existence in our actual lives.

One reason why de Waal is such a perceptive primatologist, we believe, is that he has the courage to utilize his hunch that apes are very much like us, even when they are different. A chimpanzee with the social status of alpha male might become aggressive simply because we walk in an upright position and look big and insulting to him, at least if the general attitude expressed by the human is impolite, and walking upright has not been negotiated and accepted. That is different from how a human normally reacts to another's upright position, although there are situations where whether you stand up or sit down is an issue.[36] But we are not unfamiliar with becoming aggressive when we sense that someone threatens the authority we think we should have. It is interesting that tall and strong persons often attract the attention of troublemakers, rather than weaklings whom they could more easily beat. Seeing a tall person simply makes them violent. Although apes are different in many respects, then, similarities can be sensed even in the differences. It is this basic family likeness with other primates that de Waal draws on when he decides to call the hugs and the kisses that often occur after a fight between chimpanzees *reconciliation*, and rejects the dehumanizing description 'post-conflict interaction involving mouth-to-mouth contact' (de Waal 1996: 18–19). When de Waal propounds anthropomorphic descriptions of apes in human terms as a powerful research tool for students of ape behaviour, his advice is more reasonable than many believe. The advice is based on bedrock, we think, as

long as the human terms are those of our flexible primal language, and not intellectually defined terms invented in oblivion of how the language we already have is shaped by the fact that we too are primates. Because we share an evolutionary past with the apes, profound similarities are to be expected, especially at the level of the primal language, since it is an outgrowth of what we are as human primates. Anthropomorphism is 'a logical starting point when it comes to animals as close to us as apes', as de Waal (2001: 41) explains his position.[37] We are reminded of Gregory Bateson's view of Konrad Lorenz: 'Lorenz's empathy with animals gives him an almost unfair advantage over other zoologists' (Bateson 1979: 141).

The reader has perhaps already begun to understand how we view the relation between anthropocentrism and anthropomorphism. What an anthropocentric perspective exaggerates, as we use this term, are not those aspects of culture that emerge already in childhood and then continue to sustain human life, but rather the more specialized skills and concepts that we learn when we already are enculturated. The ideas we tend to nourish about the essence of language are very much shaped by these late developments. Exaggerated faith in scientific specialization is an example of what we mean by anthropocentrism. So, while the anthropocentric draws on their professional techniques, the anthropomorphic draws on older skills and sensibilities that they developed when they began to speak the first time. That de Waal became such a successful primatologist by making anthropomorphic judgments that he thereafter evaluates empirically, and that we managed to cultivate language in apes by being anthropomorphic when we interact with them, shows that anthropomorphism can be the opposite of a projection of human terms onto nonhuman realities. Anthropomorphism can be a rediscovery of the human animal, of the kind of creature that Stanley Cavell (1979: 207) perhaps had in mind when he said that Wittgenstein's aim was to 'put the human animal back into language'. And here all of us are following in the footsteps of Japanese primatologists:

> Japanese culture does not emphasise the difference between people and animals, and so it is relatively free from the spell of anti-anthropomorphism. The conviction that anthropomorphism is not to be discarded in elucidating the complex *specia* of primates was widely held by Japanese primatologists from very early in our history, and we feel that this has led to many important discoveries, such as that of culture, paternal care and the incest avoidance mechanism.

> To avoid misunderstanding, I must point out that analogy is, of course, only a way of groping towards theoretical possibilities, from which hypotheses are formulated and then tested rigorously through field research. (Itani 1985: 597)

This is perhaps a good moment to explain in greater detail why the Pan/Homo culture is not simply an imposed version of human culture. This culture did not even exist before Kanzi, even though it had precursors in the earlier work with the chimpanzees Lana, Austin and Sherman. The intermediary Pan/Homo culture is the basically unplanned result of two species' mutual adaptations to each other. We consider writing the ethnography of this bi-species culture, for we too are enculturated in Pan reality and learn much from Kanzi, Panbanisha, Matata and the other bonobos. The Pan/Homo culture is never static, but oscillates back and forth on a Pan/Homo continuum. The more humans that engage the apes, the more human it tends to become, and the more bonobos that are gathered, the more Pan it becomes, especially when Matata, P-Suke, Elikya and Maisha, who are less oriented towards the human world, join the group. But it also depends on who the humans are, and on what we happen to be doing. There are human practices, such as stone tool manufacturing, and there are bonobo practices, such as grooming. Moreover, there are human conflicts and bonobo conflicts, which tend to be resolved rather differently. Both Pan and Homo culture have operated on Kanzi, Panbanisha, Nyota and Nathan and made them into sophisticated beings that can move in and out of the traditional cultural boundaries that otherwise separate Pan and Homo.

The same is true of well-integrated members of the LRC staff. They are bicultural and can move in and out of traditional cultural boundaries. Perhaps the most difficult aspect of Pan reality for humans to master is time perception, especially when the humans have not yet adopted any Pan culture in their ways of being. Bonobos negotiate social events at a greater pace than humans. A conflict can arise and be resolved again in five seconds with a few glances and vocalizations. What happened might be virtually invisible to a human outsider. Orang-utans are slower, and perhaps that is why they sometimes strike us as even more humanlike than chimpanzees. It is easier for humans to see what is happening in the lazy Pongo world than in the fervent reality of Pan. But Pan perception of time is not out of reach for humans. One of the amazing experiences of becoming further enculturated as humans in Pan reality is acquiring a sense of their versatile medium of

bodily communication. When we learned to read their uses of this efficient instrument, five seconds did not seem to be five seconds any more. An entire reality is resting on this rapid physical substratum. It is not uncommon that we have negotiations with Kanzi and Panbanisha and then explain what occurred to surprised human visitors who did not even notice that the apes communicated something by changing their posture or walking just slightly. But there are also more palpable aspects of bonobo body use, such as bites, displays and presenting and touching genitalia. The difficulty here is not that of seeing that something happens, but rather that of understanding what happens. In the bonobo world, genitals have many non-sexual purposes. Presenting and touching genitals is normally not about sex, but about friendship, respect, political alliances, and communicating to the group, 'we are coordinating'. This is not to deny that there are sexual undertones even in these interactions, but the connection to sex rather is *used* as a means of communication.

When it comes to displays, humans often misinterpret these as aggressive forms of behaviour. But there are many kinds of displays. A display can be aggressive, but it is most often a sign of respect, and Kanzi and P-Suke often greet us by displaying (for example, they run pushing their plastic bowl before them on the ground, which makes a lot of impressive noise). Displays often bring peace and order into the group and resolve ambiguities of who is in charge. Sometimes when our visitors are not behaving and this causes insecurity and irritation among the bonobos, we ourselves have to display to show the apes that we have the situation under control. We do our best, of course, not to insult our visitors, who often do not understand why we suddenly talk louder and act demonstratively. We learn more and more about how to coordinate with the Pan group, and few decisions are made without first talking with the apes. And then there is the use of bites. Biting has more meanings in the Pan/Homo culture than it has to humans in general. All primates use biting for play, but both playful and aggressive bites are used communicatively. You make yourself known by how you bite. You can show that you are happy, that you are nervous, that you are angry, that you are loving, or that you can be trusted. The distinctions are more fine-grained than a simple enumeration can show, since the meaning of bites is integral with the situation. You actually can learn to trust strangers by how they use their teeth! Biting can also be used for disciplinary purposes. You are bitten when you deserve to be bitten, though where you are bitten seems to depend on your status. There is also a kind of sacred evening biting between parents and children. No one but

the parent is allowed to lovingly bite the child's knuckles when it is bedtime!

Compare this to the more normal procedure in a laboratory. Experimental psychologists often avoid to be too deeply affected by their research subjects – at least while they carry out experiments and interpret results – and praise this stance as objectivity. They routinely affect the animals, however, and expose them to their professional culture as experimentalists. They do it when they condition the animals, and they do it when they observe them, in accordance with rigorously applied research schemes and specially defined concepts. This approach to living animals is, indeed, 'a thoroughly anthropocentric enterprise', and probably it is what de Waal wants to question. When he recommends to students of ape behaviour a responsible use of anthropomorphism, he actually fights anthropocentric attitudes to animals, not the least in laboratory conditions. We find ourselves in agreement with him.

Our conclusion is that ape language research can be precisely what we need if we want to illuminate and fight the anthropocentric tendencies that exist in most of us, not least with regard to our language. What we thereby rediscover in ourselves is a very general and easily unnoticed form of life that is *comparable* with the lives of many other social animals, such as the great apes. Our often improvised uses of words such as 'speak', 'intend', 'fear' and 'think' in daily-life situations reveal the extremely varied landscape of our psychology and social life as human primates. It is, therefore, important that we avoid constructing another schematic model of language and instead try to *remember* language as it already exists in our ways of living together.

What we find when we open our eyes to the fact that our psychological language (for example, the words 'afraid', 'loyal' and 'think') emerges spontaneously and boundlessly in a child's life, and that one single psychological word thereby can be placed in an open-ended series of more or less primitive, or sophisticated, 'language-games', is that we make very different psychological remarks with the same word, depending on the situation and the creature with whom we interact (although one can always trace similarities). We talk about a dog's loyalty in different ways from a teenager's loyalty, which in its turn differs from how we normally would talk about a three-year-old child's loyalty. But if someone described a turtle's behaviour as an expression of its loyalty towards its human owner, we would probably question that person's discernment. A dog may greet us, but not every animal would do so, and a dog's greeting is normally different from many human forms of greetings. Children, however, often run to the door and greet their

homecoming parents in clearly related ways: one has the feeling that if they had a tail, they would wag it.

The popular idea that psychological concepts are pre-programmed with a theory of the human mind (a folk psychology), and that talk about the psychology of animals can only mean imposing this inflexible psychological vocabulary on them, is consequently not accurate. Our primal language consists in continuous interplay with new life situations, and thereby also with new creatures (we may even talk of fear in giant squids, see Cockburn 1994). Families who adopt a new pet spontaneously talk about its psychology in correspondingly new ways. They do so in spite of the fact that the *words* they use for this new animal psychology are the same old words they use to talk about themselves (remember how variously the word 'open' is used). Their way of talking about the animal's psychology – its stubbornness, gentleness, helpfulness, curiosity, desires, intentions and actions – is not a human-centered theory imposed on an inaccessible animal mind, but a *novel* reaction in language to the animal's tangible way of being, for instance, its posture, gaze and other expressions when it acts or seeks our attention (or avoids it). Mitchell and Hamm (1997) are consequently mistaken when they deem our spontaneous psychological qualifications of animal behaviour unreliable on the ground that people tend to use the same psychological terms to describe behaviours in very different species. We always use old terms in new (but related) ways.

Our plastic primal language would be very useful for evolutionary psychologists and animal scientists, once we see beyond the myth that language contains a stable folk-psychological vocabulary whose items have pre-determined and humanly centred meanings that can be expressed once and for all in static and unitary definitions. Darwin took us beyond the popular image that the species were created once and for all, independently of each other, as if some intelligent being had designed them. One could argue that Wittgenstein instituted a similar revolution in our understanding of language. Concepts are no longer hierarchically organized according to stable and unitary definitions, as if some rational lexicographer had created them, but have a variety of changing *uses* that Wittgenstein depicts as families of more or less related language-games, where differences and similarities crisscross.[38] Words constantly have sex with each other and with aspects of our life situations, and they produce offspring in the form of new uses of themselves. This means that empirical biological research often would gain by being carried out in tandem with Wittgenstein-inspired conceptual investigations, which is how we are trying to work in this book. Anyone interested in the

possibility of systematic scientific studies of animal behaviour carried out within our primal language is referred to the impressive work of Françoise Wemelsfelder (Wemelsfelder 1997, Wemelsfelder et al. 2001). The fear of anthropomorphism, in conclusion, often rests on a false anthropocentric view of human language. Ape language research can help us overcome this anthropocentrism.

Is scepticism reluctance to acknowledge our primal culture?

Why is scepticism regarding the possession of language considered a reasonable attitude towards apes such as Kanzi, when it appears absurd with regard to us? As far as we know, no one has tried to prove, scientifically, that we humans do not merely have the attitude that we have language, but actually do possess it. Language tests are, of course, carried out by speech therapists in order to determine whether certain individuals have specific difficulties in speaking or understanding language. But such work does not aim at determining whether humanity possesses language. If someone, just to be absolutely sure, tried to prove language in humans by designing a rigorous test, it would be profoundly comical to see this experimenter discuss the test informally with the persons who accepted to participate as subjects of the experiment. What if the result turned out to be negative, would a blushing experimenter whisper to her research subjects that all of us lack language? Our knowledge that we have language is not achieved through science and cannot be made more certain through scientific research. It is nonsense to imagine this knowledge as the result of a clever experiment. The most immediate facts of life are not scientific. So, how can a sceptical attitude be obligatory with regard to Kanzi's language? Why should a clever experiment be possible in his case, when it is nonsense in our own?

Few persons have thought deeper about this problem than Talbot J. Taylor, and we turn to him for help (see Taylor 1994, and Savage-Rumbaugh, Shanker and Taylor 1998). Taylor analyzes the problem in terms of rhetoric. What we are inclined to say about animals and humans is normally different. These inclinations result in two types of rhetoric: one about animals, another about humans. Although many dog owners honestly can say about their dog, 'his barking means he wants us to take him for a walk', it is generally acceptable, especially in academic culture, to be sceptical and to say that the dog's barking 'really does not *mean* anything'. It is also acceptable to be sceptical more generally, and to ask whether *any* animal vocalizations can be said to have meaning. But what if we expressed the same scepticism with regard to

a human who suggests, 'Let's take a walk'? What if we claimed that her vocalizing 'really does not *mean* anything'? What if we continued to explain that it is questionable whether any human vocalizations ever have meaning? Well, we would probably be dismissed as crazy sceptics (Savage-Rumbaugh, Shanker and Taylor 1998: 151–2). There is, then, a rhetorical asymmetry in our ways of talking about the communicative abilities of animals and humans. Remarks that it would be absurd to question about humans are often questioned in their use on animals, even though they normally are made just as spontaneously and honestly. It is often obligatory in academic culture to question their applicability to animals. After describing this asymmetry, Taylor asks the more fundamental question of why the asymmetry is there. Why is a form of scepticism that appears reasonable with regard to animals absurd with regard to humans? Here is Taylor's answer:

> While the commonplace adoption of a skeptical attitude to everyday metalinguistic remarks about humans would constitute a dangerous threat to the metalinguistically mediated understanding of human behavior that is essential to our participation in and maintenance of social life as we know it, this is not the case for the adoption of a skeptical attitude toward everyday metalinguistic remarks about animals. It is here that one may find the source of the rhetorical asymmetry between scientific discourse about the communicational and cognitive abilities of animals and scientific discourse about human possession of those abilities. (Savage-Rumbaugh, Shanker and Taylor 1998: 153)

Taylor's explanation, then, is that there is reluctance to adopt a sceptical attitude to human communication because it would, if put into practice, threaten our human social life. The daily hardship maintaining a bi-species culture in a society that is not prepared for this possibility illustrates Taylor's explanation. Scepticism concerning the possibility that an animal can communicate and live as a fellow-creature with humans is not only a theoretical view: it is also an aspect of our regulations, institutions and even our architecture. It is hard political labour to protect the intermediary Pan/Homo culture. It is threatened almost daily, in Taylor's sense, and ape language research often tends to balance on the verge of tragedy. We are trying to overcome many of these difficulties in our new facility in Des Moines, Iowa, not least the architectural ones: the apes will have greater freedom of movement than visitors will have, for the Great Ape Trust of Iowa is meant to be their home.

Even some caregivers occasionally adopt a sceptical attitude to the communicational abilities of the apes, but not in practice, not in their daily work with the apes, for then they talk spontaneously with the apes and make everyday metalinguistic remarks about what the apes say to them. *If* a sceptical attitude were realized in practice, however, in face-to-face situations, it *would* begin to threaten social life as we know it in the Pan/Homo culture. Such disturbances do sometimes arise when visitors spend a few minutes in front of the apes. This is understandable, for it takes time to get to know the apes and understand how they live and act. But the interesting case is when a caregiver's sceptical attitude co-exists with spontaneous metalinguistic remarks about the apes; when a sceptical attitude in scholarly discussions with visitors co-exists with daily talk with Kanzi, and with sincere remarks about what he says, means and understands. We experienced this a few times when we recruited caregivers among students who already tended to identify themselves as scientists. Some of them doubted that Kanzi, with whom they were talking daily, had language: *they doubted it when they were asked general scholarly questions*. This is a thought-provoking ambiguity in their attitude to the apes, and there is a parallel between their scepticism and our own early attempts to prove language in Kanzi – while chatting with him. In those tests, we did not acknowledge what went on in normal conditions of Pan/Homo life. We imposed scientific culture on the culture we already shared with the apes and lost the ability to recognize it, even though it went on in parallel, in constant chitchat with our test subject. Let us look a little closer at the facts of scepticism.

Suppose we hired a caregiver who found it incredible that an ape can have language and mean what he says. What will she do when Kanzi reaches out for his keyboard and points to the ONION lexigram? Her new work will be virtually impossible unless she talks with Kanzi and attends to what he says. It is her job to feed him, so she *will* go and get him his onions, in spite of her scepticism, and he *will* eat them. This will go on for a couple of days, but sooner or later she *will* ask Kanzi what he wants to eat, and perhaps even suggest, 'some more onions, Kanzi?' When the eating is over, the caregiver *will* ask Kanzi to return the trash, and he *will* push the leftovers through the wire, and the caregiver *will* say, 'thank you, Kanzi', who often responds by nodding and vocalizing softly. After a few months of daily interactions, the new caregiver *will* talk with Kanzi whenever a need arises. Perhaps Kanzi wants his ball out in the enclosure, but the caregiver answers that she does not know where it is, and asks Kanzi if he knows. Kanzi points to the

building where he spent the night, but the caregiver explains that she just recently was there, tidying up, and did not see it. Kanzi points again insisting that it is indoors. After a few conversational turns the caregiver gives up and says, 'Alright Kanzi, I'll open up for you so that you can go in and see for yourself.' A happy Kanzi, who knows where his ball is, soon returns with his favourite toy, 'You were right Kanzi, it was inside!'[39] And yet this caregiver can, if she is asked, doubt that Kanzi has language in a relevant humanlike sense – the index finger is not a grammatical category.

A caregiver who doubts whether Kanzi, as a matter of fact, has language, *will*, as a matter of fact, talk with him when she meets him. She will talk with Kanzi not only as she talks with a dog, for Kanzi will reply and she will tell others what he said. If she is uncertain what Kanzi means, she will discuss this with him (design feature 10, reflexivity). Doubt and linguistic practice are disconnected. Doubt can make life less happy, it can create friction (and the apes certainly distinguish between caregivers), but it is not a threat to social life at the LRC, except in some rare cases. Sceptical attitudes tend to vanish in practical situations where interaction is inevitable. We normally need not worry about it any more than parents need to worry about how to make their infants speak. (The real threat to the intermediary Pan/Homo culture is perhaps rather decision-making by persons who do not know the bonobos.)

Scepticism can be understood as a cultural phenomenon, similar to this situation: a person makes an astonishing career and loses the ability to acknowledge her cultural background. She has that background, nonetheless, and if asked she might tell you more about it. But her story will perhaps be told as if it were inessential, for her *real* nature, behind the appearances, has always been that of an outstanding lawyer: 'I consider myself a natural born lawyer.' This may help us understand why sceptics, as noted by Savage-Rumbaugh, Shanker and Taylor (1998), choose a criterion expressed in the terms of their professional culture and declare, 'if apes don't have language in *this* sense, they don't have *real* language'. They let their technical cultures dominate over our human primal culture. Although they use the rhetoric of empirical inquiry, they promote contrived cultural self-images where language not only is uniquely human, but also a projection of the concepts they are obliged to use in their professional functions.

Observe that by 'scepticism' we do not mean the laudable critical attitude of intellectual veracity. An individual's truthfulness can express itself as an almost constantly gnawing anxiety concerning the truth, correctness and authenticity of claims, attitudes and styles. The activ-

ity of doubting and testing one's own truthfulness is an important form of scepticism, and we strive to be sceptics in this sense. But we are discussing a more destructive and self-assertive form, one that claims it possesses the 'right method' for doubting and establishing important truths, and never doubts *this* assumption. The sceptic, as we are using the term, exaggerates the weight of the professional culture with which she identifies herself, and neglects as less significant careful scrutiny of the forms of human life upon which the specialized culture is one of many ripples. Her unquestioned attitude is that the essential aspects of life are reflected in the specialized culture. Everything else is neglected as appearance. This one-sided form of scepticism (often the opposite of intellectual veracity) originates in adolescence, when we discover that people are different, that there are lawyers, businessmen, scientists, politicians and much else, all with their tools and specialized ways of being. In adolescence we already are enculturated as human beings, but it becomes apparent that culture and language can be refined and extended even further, in specific directions, almost consciously, by making choices and focusing our will powers. We are beginning to cut the diamond that we became under the pressure of the human primal culture.

A teenager who studies to become a chemist has, since childhood, used the word 'water' in the same multifarious ways, in the same everyday-life situations, as her friend who just entered law school. But if asked what they both mean by water, the first automatically responds 'H_2O!' and thinks of molecules, while the second says 'A municipal responsibility!' and thinks of lawsuits. When asked the general question of what water is, both tend to affirm their new specialized cultures and to neglect the more self-evident primal culture they have in common. It is as if they developed dual personalities and could not mediate peace between what they already are and what they became through training and education. As a result, they become partial and unable to judge the facts justly.

Entering a professional culture means developing new skills and sensibilities, but often also new forms of insensibility and clumsiness. There is just as much sensibility to *literate* linguistic nuances in the notion of language as vocabulary and grammar as there is insensibility to what it means to, for instance, attack someone in words and deeds in a non-reading situation. Even humans bite each other, but you would not think that humans are capable of such behaviour when you study a grammar book. The linguist's response to 'What is language?' resembles the chemist's response to 'What is water?' General questions such as

these tend to activate their specialized cultures, which co-exist with a life in which both talk about water and make metalinguistic remarks in basically the same ways, and have done so since childhood. General questions tend to cause forgetfulness about our primal culture in proportion to their tendency to activate specialized cultures. This is what often happens when caregivers are asked scholarly questions about the apes.

An occurrence reported by the psychologist Michael Tomasello illustrates the point:

> A few years ago I was invited to the Language Research Center of Georgia State University where Duane Rumbaugh and Sue Savage-Rumbaugh investigate the cognitive abilities of monkeys and apes. They had read my studies reporting that in many circumstances captive chimpanzees do not imitatively learn novel instrumental behaviors from one another, as well as my speculations that wild chimpanzees may not either. They proceeded to show me, live, three different apes calmly imitating all of the novel actions on objects that either a human experimenter or I could think up. Well, seeing is believing, and suffice it to say that I left the LRC suitably chastened (actually, being a good scientist, I was only totally convinced by a subsequent study in which we made sure that the behaviors modelled were truly novel and that the apes were truly imitating them). (Tomasello 1994: 377)

Tomasello's willingness to come to the LRC and see with his own eyes what he did not think was possible in nonhuman primates is admirable. That open-mindedness is an aspect of 'being a good scientist' (and of being a conscientious sceptic!) that should not be forgotten. Not everyone who is invited to the LRC comes to see us, in spite of the fact that observing the bonobos would be relevant for their theoretical positions (some claim that seeing the apes would disturb their objectivity). But now we want to discuss Tomasello's tendency in the parenthesis to write as if being a 'good scientist' primarily means something other than coming in person and actually seeing 'three different apes calmly imitating all of the novel actions on objects that either a human experimenter or I could think up'. If he just means that the improvised demonstration during his first visit was not scientifically reportable because (i) we had not kept track of all the objects that we used, (ii) had improvised novel actions without taking sufficient time to consider whether they really were novel, and (iii) had not documented properly

if the apes really imitated the human model and not achieved the same end by inventing a different method, then, of course, a second and more controlled experiment is required. But then the second study is not categorically different from the preliminary one: the experimenter interacts with the apes as before, but the experimental *scaffolding* surrounding this interaction is more carefully constructed and documented (see Tomasello, Savage-Rumbaugh and Kruger 1993). But if that is the case, then conducting the second study is just normal scientific practice. It is what every scientist does before she reports the facts: she repeats her preliminary experiments, but with a more carefully constructed and documented experimental staging. So, what is the point of Tomasello's parenthesis?

We interpret Tomasello's parenthesis as a signal of professional cultural belonging. Because he came, saw and believed as the good *human* scientist he is, Tomasello obviously felt the need to append a marker to signal that his refined human judgment could be made 'purely scientifically' too, whatever that means, and not just as any honest and sensible human being would make such judgments. It is as if the essence of the scientific test was its formal scaffolding and not what occurred inside it. We do not question the importance of the controlled study; such critical tests are essential, as the example of Clever Hans shows. What we want to discuss are the conceptual implications of the *weight* that Tomasello gives the formal scaffolding. He signals that the notions he employs as an experimental psychologist who carefully circumnavigates the interaction between the participants in the test are not just any notions that any human could use, but the proper ones, carefully employed by the authorized specialist who explores the essence of cognition. Maybe we should be satisfied that Kanzi and Panbanisha can be said to imitate even according to such 'purely' scientific concepts and experimental methods. But we are not; we think Wittgenstein said something important when he remarked that 'in psychology there are experimental methods and *conceptual confusion*':

> The existence of the experimental method makes us think we have the means of solving the problems which trouble us; though problem and method pass one another by. (Wittgenstein 1953: 232)

We are not merely discussing the existence of imitation in apes, as if the meaning of imitation was self-evident and we merely needed to ascertain its existence in apes experimentally. We are above all investigating the *sense* in which the bonobos (and we humans) imitate, and

here we still have much to learn from what occurred *inside* the formal scaffolding of our experiment – the personal interaction between the participants. The spontaneous way in which Tomasello originally *recognized* imitation in the enculturated apes is, as we attempt to show below, more truthful than the technical concept of imitation that he thinks he must use as an experimental psychologist; it just requires philosophical elucidation. Scepticism, in the sense of a conflict between our common primal culture and more specific scientific cultures, is unresolved in Tomasello's second study, in spite of the positive results, just as it is unresolved in our own formal tests. Observe again, then, that by 'scepticism' we mean here not the conscientiously critical attitude of truthfulness, but a one-sided tendency to overemphasize the weight of certain technical concepts and experimental procedures (sometimes hiding what actually occurs in the experiments). These two forms of scepticism – conscientious and dogmatic – must not be confused, although truthfulness often rightly demands carefully controlled tests. Let us look more closely at Tomasello's notions of imitation and enculturation to see how scepticism lurks there, even though he admits that enculturated apes can imitate.

In his book *The Cultural Origins of Human Cognition* (1999) Tomasello distinguishes between many forms of learning, most notably, the following three:

(1) Environmental shaping: A new way of finding earthworms is spread in a population of birds, but not because they *learn from each other* that one finds earthworms by, for instance, flying after a ploughing tractor, but because the environment has this effect on each one of them individually.
(2) Emulation learning: An animal pushes away logs and eats the insects under them, and soon the entire group does so, but not because they *learned from* the first animal that one finds insects by pushing away logs, they simply saw the insects under the log and went for them.
(3) Imitative learning: A human child *learns from* her grandfather how to use a fishing rod to catch fish because she can see her grandfather as 'an intentional agent like the self' (as Tomasello expresses it), and therefore she can imitate his instrumental behaviour to achieve the same goal.

Armed with these distinctions, Tomasello critically reviews some of the most famous reports of culturally transmitted behaviours among non-human primates, such as the use of sticks to catch termites in certain

chimpanzee populations. Do the apes *truly* learn this tool use from each other in the full sense of (3), or rather in the hollow sense of (1) or (2)? Tomasello is sceptical. There are simpler explanations of chimpanzee tool use than imitation. It can be explained as environmental shaping. A population of chimpanzees might fish for termites using sticks as tools simply because there are plenty of termites and sticks around in the area where they live. Each ape develops this tool use individually, influenced by the environment. Other tool uses in apes can be explained as emulation learning (Tomasello 1999: 28–31). We admit that Tomasello's alternative explanations probably are correct in many instances. But as we shall see below, Tomasello is not just saying how it might be in many cases, but how it *must* be generally.

Tomasello's scepticism concerning imitative learning among animals is motivated not only by a desire for simple explanations, but also by an overarching aim of constructing a general theory of human nature within the confines of cultural psychology. The general problem that motivates the new theory is that human cognitive skills apparently developed at a much greater pace than evolution itself can make possible. Consequently, these skills must have been boosted by some additional mechanism. Tomasello's suggestion is that this additional mechanism is cultural learning. Language, mathematics, social institutions and other important features of human life have been invented, transmitted and developed culturally rather than through the slow process of biological evolution. But since the motivating problem is why only the human species underwent this rapid cognitive development, the booster *must* be uniquely human. Otherwise, we have no explanatory scheme that fits the structure of the motivating problem. So, why is cultural learning uniquely human? According to Tomasello, cultural learning is uniquely human because it involves the capacity to understand others as intentional agents like the self. That cognitive capacity is – *must be* – the unique component of our biological inheritance that accounts for the unbridgeable difference between humans and animals:

> This one cognitive difference has many cascading effects because it makes possible some new and uniquely powerful forms of cultural inheritance . . . This means that most, if not all, of the species-unique cognitive skills of human beings are not due to a unique biological inheritance directly, but rather result from a variety of historical and ontogenetic processes that are set into motion by the one uniquely human, biologically inherited, cognitive capacity. (Tomasello 1999: 15)

Tomasello has studied chimpanzees in laboratories for years and he knows that they are intelligent and easily develop new behaviours. But the vital difference, according to him, is that these forms of behaviour do not accumulate, nor are they modified and developed over the generations. This idea does not do justice to the Pan/Homo culture. Kanzi and Panbanisha introduce Nyota and Nathan into the culture they share with humans, and Nyota and Nathan are keenly interested in Kanzi's stone tool making. As we remarked when we presented the tenth design feature, Kanzi sometimes acts as teacher, and Panbanisha treats her young ones as she was raised herself by humans. Many of the elements of Pan/Homo life that we taught Kanzi and Panbanisha, when they were young, we do not have to teach Nyota and Nathan (we are, to some extent, their grandparents). It was, moreover, easier for Panbanisha to learn stone tool manufacturing from Kanzi than it was for Kanzi to learn this craft from humans. The Pan/Homo culture is maintained and transferred to the young apes not only by humans, but also, and often more efficiently, by the bonobos themselves. We have no reason to suppose that wild apes should not have similar abilities. But let us return to Tomasello's way of reasoning. Why do apes (as he sees it) not maintain and develop cultures? His answer in *Cultural Origins* is that apes do not have the biologically-inherited capacity to understand others as intentional agents:

> In the absence of this ability to understand goal and behavioral means as separable in the actions of others, chimpanzee observers focus on the changes of state (including changes of spatial position) of the objects involved during the demonstration, with the actions of the demonstrator being, in effect, just other physical motions. The intentional states of the demonstrator, and thus her behavioral methods as distinct behavioral entities, are simply not part of their experience. (Tomasello 1999: 30–1)

While a human child can look at grandfather and understand that he is holding that wooden stick (the fishing rod) the way he does because he uses it as a means towards the end of catching fish, a chimpanzee just stares at another chimpanzee's stick, Tomasello claims, and then at the delicious termites on the stick when it comes up out of the hole in the ground, and perhaps it grabs a stick itself simply because sticks became associated with lovely termites. So, very soon, this ape, too, uses sticks with the intention of catching termites, although it is absolutely

incapable of seeing other apes the same way. Real cultures cannot be maintained and developed according to such haphazard processes, Tomasello argues. Real cultures presuppose the uniquely human ability to see others as intentional agents, since that ability allows for faithful imitation: it has a 'ratchet effect' on innovations that makes stable cultural evolution possible (Tomasello, Kruger and Ratner 1993). Observe that Tomasello's claim is not merely that apes often happen to observe others and acquire new behaviours in a haphazard 'solipsistic' way. It is how it inevitably *must* be, for while 'nonhuman primates are themselves intentional and causal beings, they just do not understand the world in intentional and causal terms' (Tomasello 1999: 19). Tomasello's theory is not merely a description of the facts, but a general direction for how the facts *must* be organized.

Tomasello's categorical style of reasoning about apes and humans is probably dictated by his abstract theoretical aims, for it was not so conspicuous in Tomasello, Savage-Rumbaugh and Kruger (1993) or Boesch and Tomasello (1998). And in Tomasello (2001) he warns the reader in a footnote that things may not be as black-and-white as he makes them out to be. Today new experiments force Tomasello to reject his position in *Cultural Origins*, and he admits that chimpanzees do understand some psychological states (see Tomasello, Call and Hare 2003, Tomasello et al. in press). However, his reasoning retains the same form: instead of a uniquely human capacity to see others as intentional agents, he now speaks of a uniquely human motivation to share intentions. What interests us here is not Tomasello's latest position concerning what he thinks must be uniquely human, but his *more general way of reasoning* even when he *admits* that enculturated apes imitate, and that chimpanzees understand some psychological states. We want to discuss the relation between his invented psychological concepts and what enculturation and imitation already are in the contexts of our actual lives. Therefore, we return to Tomasello's reasoning in *Cultural Origins*, where he explicitly discusses enculturated apes such as Kanzi.

If Tomasello's evolutionary scheme is correct, then Kanzi as we know him is impossible or at least he cannot imitate. The theory rests on the fundamental assumption that seeing others as intentional agents is a uniquely human, biologically-inherited capacity that is required for imitation and culture. Apes cannot imitate or acquire culture in the full sense of these words, for they lack the necessary biological equipment. Yet, he knows that enculturated apes can imitate, for he has seen it himself:

> It may be objected that there are a number of very convincing observations of chimpanzee imitative learning in the literature, and indeed there are some. (Tomasello 1999: 34)

This strikes us as very close to saying, 'It may be objected that my theory is refuted by the facts, and indeed it is'. Nevertheless, it is how Tomasello introduces the theme of enculturated apes in his theoretical exposition. He then goes on with the kind of reasoning we previously saw irritated Frans de Waal. He suggests that enculturated apes can imitate only because they benefited from humanity's shining light:

> This raises the possibility that imitative learning skills may be influenced, or even enabled, by certain kinds of social interaction during early ontogeny. (Tomasello 1999: 34)

It appears that the facts of enculturation are beginning to erode Tomasello's theory, although he continues as if nothing had happened; in fact, he even refers to his own earlier study of imitative learning in apes and children:

> The major result was that the mother-reared chimpanzees almost never succeeded in reproducing both the end and means of the novel actions (i.e., they did not imitatively learn them). In contrast, the enculturated chimpanzees and the human children imitatively learned the novel actions much more frequently, and they did not differ from one another in this learning. (Tomasello 1999: 35)

It is difficult to avoid the impression that Tomasello is refuting his own theory, as if he was just providing further evidence in its support. If at least some nonhuman primates learn imitatively, and if imitation presupposes understanding others as intentional agents, then the latter capacity is not uniquely human, and Tomasello's explanatory scheme collapses. It no longer has the structure that is demanded by the motivating problem. Tomasello suddenly stops reasoning as if the capacity to see others as intentional agents were a prerequisite for culture. He departs from his own theory. He reasons the other way round, as if enculturated apes acquire the ability to imitate from culture:

> In a human-like cultural environment . . . they are constantly interacting with humans who show them things, point to things, encourage (even reinforce) imitation, and teach them special skills – all of

> which involve a referential triangle between human, ape, and some third entity. Perhaps it is this socialization into the referential triangle – of a type that most children receive – that accounts for the special cognitive achievements of these special apes. (Tomasello 1999: 35)

Tomasello's presentation of enculturated apes as 'special apes' is to some extent fitting, for they are unusual and they do exhibit remarkable skills. But he seems to speak normatively (as we previously saw Frans de Waal do), and to present them as radical exceptions, as if they were not real animals with their own culture, but rather parasites on human culture. Otherwise, it is difficult to understand how he can discuss these apes without seeing them as a clear refutation of his theory. It is evident that Tomasello places more weight on his theory than on the enigmatic facts of enculturation, and we admit that it is not unreasonable for him to do so. If the meaning of a fact is difficult to comprehend, then you do not treat it as consequential. You do not question your own most central convictions on the basis of what for you are just shadowlike semi-facts, and Tomasello admits that he does not fully understand enculturation:

> These studies show that apes raised by human beings in a human-like cultural environment – sometimes with and sometimes without explicit training – can develop some human-like skills that they do not develop in their natural habitats or under more typical captive conditions. *What exactly are the effective factors that produce these outcomes is not known at this time*. (Tomasello 1999: 35, our emphasis)

We write this book because not even we have succeeded to communicate the full meaning of enculturation in a way that satisfies us. The reason we have failed should by now be obvious. The apes' enculturation involves us as persons in ways that cannot be demarcated in neat explanatory schemes, because enculturation is spontaneous and boundless and takes place in personal dimensions. The task of achieving clarity about our primal culture – the culture that affected Kanzi – when the expert cultures fail to provide a fair picture, simply takes time. It is essential that we did not apply a specially devised teaching program, but ourselves with an emphasis on traits of human reality that emerged in childhood. We repeat this point: we applied ourselves, the culture we already have as humans. And human existence includes certain openness to different and yet familiar forms of life (for example, Pan reality). The only way of transforming Kanzi was by respectfully allowing him

to transform us according to his form of existence: an intermediary culture had to be allowed to emerge. Our results are, one might say, the reward of this openness: 'In the end we are always rewarded for our good will, our patience, fairmindedness, and gentleness with what is strange; gradually, it sheds its veil and turns out to be a new and indescribable beauty' (Nietzsche 1974: 334).

It follows from the above that imitation, language and the intermediary Pan/Homo culture did not emerge because of well-defined 'effective factors', as Tomasello assumes. This applies, of course, also to his recent ideas about a uniquely human motivation to share intentions, which is meant to be an 'effective factor' explaining the emergence of human culture. He continues the passage just quoted by suggesting that the 'effective factor' explaining enculturated apes' skills might be that they always have someone who 'points for them, shows them things, teaches them, or in general expresses intentions toward their attention (or other intentional states)' (Tomasello 1999: 35). He reasons as if the apes played the subordinate role of pupils and the humans the leading role of pointing instructors, and as if this pedagogic relation was the genesis of every other humanlike trait in the apes. But the teacher-pupil relation is only one relation among many: we did not start up our Pan/Homo life with the apes in a propaedeutic practice of pointing, showing and teaching. Sharing life with Kanzi meant chasing him, catching and biting him, tickling him, travelling with him, sharing food with him, camping with him, and many other things. He would not pay attention to our gestures or react to them in relevant ways unless we first established this more personal relation to each other by doing lots of things together, thereby starting the enculturation process on all fronts simultaneously. Tomasello overlooks, we believe, the importance of the contents of a culture – the 'daily stuff of life' (Fox and King 2002: 11) – and the possibility that the dichotomy between ways of life and mechanisms of transmission is a false one.

From Tomasello's theoretical perspective, it is natural to ask us: 'How could you do all these things with Kanzi if you had not first moulded his ability to see you as intentional agents by an enormous amount of pointing, showing and teaching? Did you not point so over-explicitly that he finally understood that you too have feelings and perhaps even intentions? *Then* you could start doing all these things with him, in a real, or almost real, culture.' It sounds as if Kanzi were the sceptic demanding lots of gesturing to believe that we too have thoughts and feelings!

Pointing is not self-evident, as Povinelli et al. (1997) can be said to have demonstrated experimentally, so this simple hand gesture could hardly make Kanzi see us as intentional agents. Pointing can be introduced *culturally*, however, in the context of activities that already are shared: 'The arrow points only in the application that a living being makes of it' (Wittgenstein 1953: 454). In Kanzi's case, pointing was introduced mostly while travelling in the forest. We follow many tracks during our daily walks, and when we approach a fork it is not uncommon that we hesitate about how to continue. But then we might simply continue in the Flatrock direction, and do so unhesitatingly. This rudimentary situation can be shared with other primates. Approaching the fork, hesitating, and then continuing along one of the well-known tracks is a characteristic experience for primates who regularly travel through the same forest area looking for ripe fruit. A familiar series of events unfolds, and at a certain moment it is natural for humans to point. This was how young Kanzi soon started to point out the direction he wanted us to take, spontaneously with humans after having seen the humans point. So, unless we already share a life in which gestures can have meaningful uses, it is difficult to see how gestures can function as cognitive strings weaving minds together. Pointing may tie us closer together, but it presupposes that we already share ways of life and negotiate joint projects, such as looking for food.

Here is where Tomasello's theoretical vessel finally crashes against the sunken rocks of the primal culture. We assume that what we just said about travelling in forests and pointing out which direction to take activated the reader's sensitivity to everyday life and made it easy to remember more details about it. Tomasello presents his theory as if he were a sharp-sighted Platonist who could see *beyond* mundane life, beholding the abstract ideas and the cognitive mechanisms that provide human experience with whatever content it has. He beholds the idea 'others as intentional agents like the self' as a hidden capacity that humans put to work when they take a walk by the river and perceive that someone is sitting there fishing. This capacity is extra sorely tried when humans *point* at people who are fishing. So, life as it is under the open sky has a hidden life-support system – human cognition – reflecting Tomasello's technical concepts.

Tomasello was led onto the right track by seeing the bonobos imitate. He sat down and saw them do things they were not supposed to be able to do. This forced him to depart from his theory and acknowledge that enculturated apes develop an ability to imitate humans in a shared

culture. Thus acts a genuine scientist. But when he returns to the office and to the 'purely theoretical' question that belongs there, the one about the origin of human cognition, he takes the wrong sidetrack by thinking that he can identify the effective factor as a uniquely human propaedeutic practice of pointing, showing and teaching. He is wrong, because he assumes that we imposed human culture on the apes, first by over-explicitly pointing and addressing their intentional states, thereby weaving our minds together, and then by demonstrating new skills that they could imitate because pointing made them see us as intentional agents. Tomasello overlooks the importance of the fact that the bonobos and we are *bicultural* creatures doing things together on an ape/human *continuum*. That is why humans and bonobos in the Pan/Homo culture see – not hypothesize! – each other as feeling, intending, acting and thinking beings, and why the ability to imitate gradually expanded to more human-oriented activities. What started the bonobos' development was what they had in common with us already as immature infants: a flexible interface of primate responses where interaction takes place largely beyond conscious control. It was not an imposed and humanly controlled pedagogic practice. And once inside this labyrinth of primate life it gradually expanded, over the years, into the Pan/Homo culture. This intermediary culture houses some pedagogic practices, but they have no privileged position.

Enculturation occurs in labyrinths of life, not in referential triangles. It is not a semi-pedagogic demarcated practice used to teach apes about the contents of human life. It is true that we sometimes, when we are indoors carrying out tests, act in a more pedagogic style, and that we occasionally even direct the apes' attention to a boring task by physically turning their heads towards us (as parents do when they want a child's attention against her will). But it is essential that this is an exception: an effect of enculturation rather than its cause. Our notion of enculturation emphasizes that '"learning" is not as academic a matter as academics are apt to suppose' (Cavell 1979: 171).

Let us consider imitation by trying to remember how it can occur in the life we already have. We assume that most parents remember what it is like to show their children how to unlock the door or how to use a watch. Although children easily learn new skills imitatively, it also happens that they surprise parents with suddenly not being able to imitate at all. For instance, a two-year-old child may imitate her father who demonstrates how to put geometrical objects in a container by pushing them through holes in the lid, where it is essential that the holes have the same geometric shape as the objects (a common toy).

However, the child imitates only an aspect of the parent's behaviour: she grabs objects and tries to push them through the holes, but pays no respect to the geometrical shapes. This can go on for months and a dazzled parent, who repeatedly tries to focus the child's attention on the obvious importance of shape and tries to make the child imitate this aspect of the activity, finally gives up, knowing that the child some day will know, so one might just as well simply wait until this ability emerges.

It is possible to *remember* that imitation is not an all-or-nothing capacity. Perceiving intentionality and being able to imitate are intertwined with what a child already can do, with her state of enculturation, with how she can relate to a situation. Seeing what others are doing in various situations cannot be reified as a demarcated 'cognitive capacity' that we exercise independently of the culture:

> An intention is embedded in its situation, in human customs and institutions. If the technique of the game of chess did not exist, I could not intend to play a game of chess. (Wittgenstein 1953: 337)

Can a two-year-old child, who sees her mother read the paper, perceive the mother as an intentional agent and imitate her? If the child grabs a paper and looks a bit like the mother, but holds the paper upside down, then in some sense the child imitates the mother, but in another sense she fails. The child understands some aspects of what the mother is doing, but not all aspects. And how do adults, who can imitate reading persons, distinguish between behaviour and goal in the activity of reading a paper? Do adults grab the paper, unfold it and direct their eyes toward it, hoping that these behavioural means shall achieve the goal of reading? What would it mean to take up a paper and say, 'Let's see if my reading behaviour will achieve my usual reading goal this morning'? The dichotomy between 'overt behaviour' and 'hidden intentions' (regardless of whether they are shared or not shared), or between means and goals, evaporates in confrontation with the most primal facts of life.

If the goal of reading the paper is to read more about some important event, then a distinction between means and goal is possible, and reading the paper may fail to achieve the goal if nothing is written about the event. But this distinction is not an 'ontological' dichotomy between overt behaviour and occurrences in a hidden mind, but rather a practical distinction between one activity, taking up the paper and reading it, and a subsequent activity, finding the article you want to

read and reading it. This exemplifies how 'means' and 'goals' can be distinguished in the streams and currents of everyday life events. Tomasello's dichotomy between abstractly defined categories is in conflict with the manner in which the distinction between means and goals can be remembered to have a variety of everyday appearances in human life; appearances that do not necessarily have a common defining property. Stuart Shanker (1994, 2001; Savage-Rumbaugh, Shanker and Taylor 1998) has named prevalent forms of this unhappy reluctance to learn from life itself 'Cartesianism'.

The ability to see acting persons as intentional agents and imitate them is interlaced with the onlooker's state of enculturation. Imitation starts humbly in infants and develops only gradually. The more you can do, the more you can imitate on the basis of what you already know, and the trajectory of your ability to imitate depends on the actions you experience and are motivated to adopt. This is why the enculturated bonobos' capacity to imitate has become visible even to anthropocentric onlookers. The bonobos have, slowly but steadfastly, developed a human-oriented ability to imitate from the humble beginnings of primate infancy. The actions they saw around them always made sense to them, and worked as a continuously updated starting-point for imitating actions even more thoroughly placed in the culture we humans have: actions on our end of the Pan/Homo continuum. This is why we emphasize that the culture that achieved the results we discuss in this book is an intermediary ape/human culture. The idea of testing imitation of humanlike actions on humanlike test objects that have no connection to the life that the apes on the Pan end of the continuum live would be forgetful of how objects and actions are placed in ways of life. Observe that we humans would most often not be able to imitate Pan activities, since we rarely understand what apes do in their life situations. But enculturation in an intermediary Pan/Homo culture would heal some of this autism and create an increased ability to understand bonobos as feeling, thinking and intending beings that can be imitated.

Remember also that although there are many situations in which we can imitate what another person is doing, activities that can be imitated are demarcated in one way or another. But there are many situations in which it would be a joke to turn to someone else and say 'do this, do what I'm doing', for it may not be clear how we should demarcate what we are doing, or isolate a reason. Our actions are rooted in an entire form of life that cannot be surveyed. (That is one reason why we so often have to correct children who ask too many questions by saying,

'that is simply the way things are'.) The distinction between means and goals, and thereby the concept of imitation, has more limited applicability to daily life than Tomasello takes for granted.

Michael Tomasello's concept of imitation is technical, which is all right as long as we see its limitations. But his reliance on the abstract idea of 'seeing others as intentional agents like the self' (and more recently on the idea of 'sharing intentions') illustrates the sceptic's tendency to exaggerate the weight of theoretically constructed 'thin' concepts and to overlook the significance of the more everyday traits of human life. His scepticism is interesting because it is one of the most moderate and reasoned forms of scepticism we have seen. He does not refuse to study the facts closely; he carries out detailed experiments with humans and chimpanzees; he works with leading primatologists; he changes his views in what appears to be a promising direction. Discussing Tomasello makes it easier to isolate the determining factor in the scepticism about the lives of animals. The sceptic magnifies the significance of invented intellectual constructions at the expense of our already existing *lives*, and this attitude must be distinguished from the conscientiously critical attitude of intellectual veracity. Although truthfulness often demands clear definitions and controlled tests, it is important to keep in mind that being truthful does not mean subordinating our entire reasoning power to these mere aids of truth. Such one-sided subordination often paralyzes our understanding and hides what occurs between the interacting participants in our experiments.

Scepticism about human life

Let us return to the apparently paradoxical phenomenon of sceptical caregivers. We find that we understand sceptical caregivers better when we compare their attitudes to the better-known scepticism about the human sphere. Not too many decades ago, radical behaviourists claimed that even the simplest psychological statement – for example, 'he is having a toothache' – fails to describe humans in a strictly meaningful way, and that scientific psychology, and hence the good scientist, must interpret all psychological statements in terms of physical observables. Strange as it may sound, this is probably why the behaviourists generally were more positive about ape language research than the cognitivists have been. For the behaviourists, animals provided researchers with manageable models for the 'rigorously scientific' interpretation of human psychology:

> We study the behavior of animals because it is simpler. Basic processes are revealed more easily and can be recorded over longer periods of time. Our observations are not complicated by the social relation between subject and experimenter. Conditions may be better controlled. (Skinner 1953: 38)

It is undoubtedly easier to act strictly scientifically towards an animal than towards a human being. It is not clear, however, if this attitude to the scientific interpretation of life always was 'strictly' scientific. Science had a wider moral significance for Skinner. He hoped that laboratory studies of animal behaviour paved the way for a future victory of scientific culture over humanity's dark and violent history:

> The methods of science have been enormously successful wherever they have been tried. Let us then apply them to human affairs . . . Indeed, this may well be our only hope. (Skinner 1953: 5)

If human beings could be said to have language in a sufficiently well-controlled 'scientific' sense – without interfering social relations between subject and experimenter – then what a big step that would be, Skinner apparently felt, toward the goal of controlling human affairs scientifically. He believed that the methods that were used to study animal behaviour could be transferred to human verbal behaviour:

> The basic processes and relations which give verbal behavior its special characteristics are now fairly well understood. Much of the experimental work responsible for this advance has been carried out on other species, but the results have proved to be surprisingly free of species restrictions. Recent work has shown that the methods can be extended to human behavior without serious modification. (Skinner 1957: 3)

For the behaviourists, then, humans were not categorically different from animals. The only living creatures they treated as unique were the scientists themselves with their scientific method: 'a unique intellectual process which yields remarkable results', Skinner (1953: 11) explains. Skinner's faith in science was a characteristically modern outlook on life that still is alive in Chomsky's (1996) emphasis that his notion of language is technical rather than ordinary, and in Tomasello's idea of the good scientist who uses extra-authoritative concepts. Perhaps the World Wars made many intellectuals believe that since humanity evidently

cannot control itself morally it must try the possibility of controlling itself scientifically. The World Wars may have strengthened an exaggerated faith in scientific specialization (which does not exclude that valuable technical results thereby were produced). The moralizing remained, but clothed in scientific rather than religious terms, and all hopes became associated with the human subordination to 'science'. Nothing is more terrifying for moralists than uncontrollably human humans.

The obvious differences between Skinner, Chomsky and Tomasello do not concern us here. What concerns us is their common tendency to exaggerate the weight of their technical cultures; a tendency we believe can undermine genuine science. To find someone who is sufficiently different to make us raise our eyebrows, we return to Frans de Waal. He was truly exceptional when he trusted his hunch that the description 'post-conflict interaction involving mouth-to-mouth contact' was untrue because it dehumanized two chimpanzees who evidently reconciled. He demanded a subsequent empirical study to confirm his judgment, but that study was motivated by his original human reaction. To appreciate how unique de Waal's choice was to adhere to Japanese principles of biology and draw on the culture he already had, and thereby our primal language, we refer the reader to the conversation analysts, who attempted to make human conversation a subject matter for 'rigorous' scientific studies by choosing exactly those dehumanizing forms of description that de Waal rejects for chimpanzees. Here is how the conversation analyst Gail Jefferson explains how she will treat laughter in conversation scientifically:

> I shall focus on one of several techniques by which laughter is invited – *a post-utterance completion laugh particle* by that utterance's speaker – and recipient activity subsequent to that particle will be examined for its acceptance/declination import. (Jefferson 1979: 80)

De Waal would probably protest if he heard an experimental psychologist demand that chimpanzees must be described in dehumanizing terms such as these. But the conversation analysts saw the possibility of a purely scholarly culture, where professionals describe talking and laughing humans in empirically well-controlled clinical terms such as these, as a major scientific breakthrough. And just as in the case of Skinner and Chomsky, the reason purely academic culture was felt to be a necessary corrective was that one saw ordinary human culture as a moral or intellectual danger:

> The common or vernacular culture is, after all, a sort of 'propaganda arm' of the society, serving to undergird [*sic*] the cultural component of the more or less smooth functioning of the society itself, not to advance or enhance a rigorous *understanding* of society. (Schegloff 2003: 44)

This statement, made by one of the fathers of conversation analysis, reveals, however, that what one fears are not those aspects of human life that we develop in childhood and then retain as a modifiable substratum of everything we do. None of the specialists we mentioned above appear to recognize their primal culture. What they perceive and react to are tendencies in the prevailing *official* cultures, such as politics and journalism, and perhaps also the opinions that we begin to repeat with conviction in adolescence (and often continue to repeat thereafter). Their reaction is to see the way out of the public situation in a more rigorous subordination of themselves as human beings under an even harder regime of academic practice. It is the decision to become scientific monks.[40]

Enculturated bonobos bring a happier message. We approach Kanzi, Panbanisha, Nyota and Nathan in the opposite way than the behaviourists approached laboratory animals. Their goal was to dehumanize the animals as a preparation for a 'purely scientific' description of human nature, in humanity's best interests. If we were to see the bonobos as models, then it would be in the sense that observing them, and being with them, makes it easier to remember who *we* are. We are confronted with aspects of human life where we do not expect to find human traits. The triviality of these traits for the normal purposes of daily life tends to make us neglect them. But seeing these traits in bonobos helps us to notice them and to see their significance for who we are. Enculturated apes make human nature more conspicuous. Thereby, they counteract the scepticism about both human and animal life.

Coming to know Kanzi

Let us conclude this discussion of scepticism where we started it, with the sceptical attitude to ape language that academic culture often demands, and the concomitant demand to prove that apes have language in tests that are controlled by the same technical culture. Tests and statistics are important, but they cannot replace coming to know Kanzi and experiencing what it means to talk with him. Some critics'

idea that they can best evaluate Savage-Rumbaugh's claim that Kanzi has language by studying the empirical data meticulously as they appear in print, is a decision to treat Kanzi merely as a generic object in Stanley Cavell's sense, as a specimen of *Pan paniscus* and not as this particular ape with whom we talk every day. Remember how the names of species tend to occur in reports of laboratory studies – for example, 'Strategies Used to Combine Seriated Cups by Chimpanzees (*Pan troglodytes*), Bonobos (*Pan paniscus*), and Capuchines (*Cebus apella*)' – as if the experiments were not unique encounters; as if the animals under study were not individual beings with unique relations to the humans carrying out the studies. But one does not speak with a *specimen* of *Pan paniscus*. One speaks with Kanzi, who might be sad because he has not seen Matata for a week; one speaks with Panbanisha, who perhaps is irritated because she does not like the visitor who arrived yesterday; one speaks with Nyota, who might be happy because Bill just took him for a walk in the forest. 'Biology must treat living things as living things, not as lifeless specimens' (Imanishi 2002: 7) – that is to say: 'What is needed is a methodology which, from the start, describes animal behaviour in personal terms' (Wemelsfelder 1997: 80).

Here is how Talbot Taylor expresses what it would mean to evaluate Savage-Rumbaugh's claims about Kanzi's abilities on the basis of the experience that actually backs up the claims:

> One way of putting this might be to say that coming to an appropriate evaluation of those claims – learning how to evaluate those claims sensibly – involves coming to know Kanzi. (Savage-Rumbaugh, Shanker and Taylor 1998: 177)

It may be objected that even sceptical caregivers come to know Kanzi. That is true, and they do talk with Kanzi and tell us what he said. But when they are under the influence of academic culture, for instance, when they are asked to express their general opinion about Kanzi's language skills and feel the demand to answer the question in established scientific terms, they may lose the ability to acknowledge their relation to Kanzi in their daily lives as caregivers. This is to some extent a genuine and sincerely felt uncertainty, because it is difficult to describe Kanzi's language with the accuracy the task demands. But the difficulty to recognize his language is deadlocked by the demand to use notions of language as a form of second language. Our conclusion is that the scepticism we have addressed is the expression of an antagonism between aspects of human culture. The sceptic fails to acknowledge

what is most evident: our primal culture and language. She is engaged in what Stanley Cavell (1979: 207) called 'a rejection of the human'.

Was Socrates the first cultural primatologist?

The concept of culture was used in the first two chapters mainly to communicate what occurred at the LRC and to clarify the sense in which Kanzi has language. In this chapter, the concept is used in a more self-searching fashion. Culture is treated as the reality in which we move, gesture, act and talk in daily life, but also as the framework within which we think and do research. The term 'culture' and thereby, to some extent, 'history', rather than 'mind' or 'language', suggests the dimensions within which we best understand and assess ideas. We suggested such a cultural diagnosis of ape language research when we described the difficulty of understanding its everyday cultural dimensions and the form of scepticism with which the research often is met in more contrived cultural contexts.

We suggest that philosophy, even when it is presented as critique of language or as critique of reason, is better understood as critique of culture; or more precisely, of imbalanced forms of the cultural ambiguity of human life. We are engaged in such a philosophical critique in this book when we demonstrate the neglected weight of the culture we already have as humans (for example, before we decide profession); the weight of our primal culture. The relativism that many philosophers felt called to reject is, in the final analysis, relativism of opposed specialized cultures, of sophisticated ways of being and thinking that forget, or reject, or fail to come to terms with their roots in a common human reality. It is specialized cultures rather than mere vocabularies that clash with each other, for vocabularies and conceptual schemes are hollow unless humans propound them acting in their preferred environments. Certain privileged facts are overemphasized at the expense of others and the geography of vast domains is modelled on the basis of the few facts that the members of the technical culture can treat elegantly using their instruments. Ideas nourished in specialized cultures therefore tend to be normative. Such ideas do not describe the few facts one happens to be gathered around, but function as directions for how life more generally *must* be organized. The truth of relativism, then, is that the advocates for various viewpoints fail to acknowledge the primal aspects of culture since they exaggerate the 'thin' intellectual perspective they consciously adopt and work within. They fight for dominion in the vacuum that this insensibility to what is most evident creates. This is the arena

that the philosopher enters, but with a different understanding of their task than the combatants. Philosophy treats a problem-ridden ambiguity in our existence as cultural beings by helping us see the dependence of intellectually controllable aspects of culture on more primordial aspects of our lives; aspects that largely are beyond our conscious control.

It is logical, we think, that philosophy developed in a sprawling city-culture full of ambitious young men who promoted their political careers by giving long speeches in which they argued that *they*, on the basis of *their* experience and education, knew better than the rest the meaning of virtue, courage or justice. Socrates' questions arrested brilliant youths, just about to become competent citizens, and made them doubt their professed knowledge as future leading Athenians. Socrates went from coterie to coterie and probed into their forms of knowledge, as the most reputed representatives could elaborate this knowledge. He needed to understand why the oracle of Delphi said that no one was wiser than Socrates. In what sense was the idler wiser than the most ambitious citizens of Athens?

> after the public men I went to the poets, those of tragedies, and those of dithyrambs, and the rest, thinking that there I should prove by actual test that I was less learned than they . . . Finally then I went to the hand-workers. For I was conscious that I knew practically nothing, but I knew I should find that they knew many fine things. And in this I was not deceived; they did know what I did not, and in this way they were wiser than I. (Plato 1914: 85, 87)

As could be expected, the best functionaries and craftsmen of Athens knew many great things in their own fields that Socrates did not know. But then he makes the following observation. Even though these active men were gathered in a single city, and contributed, each in his special way, to its prosperity, they all had one and the same failing:

> But, men of Athens, the good artisans also seemed to me to have the same failing as the poets; because of practising his art well, each one thought he was very wise in the other most important matters, and this folly of theirs obscured that wisdom. (Plato 1914: 87)

What Socrates refutes is not distinguished Athenians' knowledge of what they experience and master in their own quarters, but their claims to general knowledge, their responses to general questions, such as

'What is virtue?' However, Socrates' repeated refutations created a common misunderstanding, namely, that he was wiser than the other men in the sense of knowing what they did not know:

> For on each occasion those who are present think I am wise in the matters in which I confute someone else. (Plato 1914: 87)

This is the expert's misunderstanding of philosophical criticism. He assumes that only an even more knowledgeable person can prove him wrong, and therefore he imagines the philosopher as an absurd competing super-knower. But Socrates does not know more than the person whose knowledge he probes into. *He simply asks more questions*. Socrates asks general questions and demands general answers, but he is not satisfied just because the answers are general, *for he continues with endless follow-up questions*. Socrates' follow-up questions function as reminders, for they focus the attention on simple facts and aspects of things that escaped the attention of the probed person. Had the probed person considered these neglected cases, he would not have answered as he did. The result of Socrates' questioning, then, is the acknowledgement that no one, and certainly not Socrates, knows the general answers to the general questions of life. And this, Socrates guesses, is the sense in which he is wiser than the most knowledgeable Athenian citizen:

> I thought to myself, 'I am wiser than this man; for neither of us really knows anything fine and good, but this man thinks he knows something when he does not, whereas I, as I do not know anything, do not think I do either. I seem, then, in just this little thing to be wiser than this man at any rate, that what I do not know I do not think I know either.' (Plato 1914: 83)

Our question is how Socrates is able to ask these follow-up questions that call to mind new cases and aspects of things that are situated outside of the probed person's consciously cultivated 'system of beliefs'. How can Socrates go beyond the probed person's specially cultivated knowledge and confront him with previously unconsidered facts and aspects of things? Evidently, Socrates has *something*, even if it is not a 'system of beliefs' or a 'specific culture', as relativists use these terms. Socrates must own something that makes it possible for him to take the investigation beyond the limits of the Athenians' consciously promoted ideas. It must be a most valuable possession, a real treasure for a human being, since it outshines even the greatest minds. What is it?

Whatever Socrates has, the probed person has it too, since he repeatedly acknowledges the relevance of Socrates' follow-up questions and admits that the aspects of things that Socrates comments upon make his answers unsatisfactory. So, what do both have, that makes it possible for them to carry on the discussion together, and take it beyond the limits of the coterie in which it started? Socrates (or Plato) interpreted the situation in terms of a myth. According to this myth, we were once, before birth, pure souls that could behold the ideas directly. In our earthly existence we forget what we once knew perfectly, and are engaged in recollection of what we can only vaguely remember. It is difficult to take this myth seriously today. A more reasonable interpretation might be achieved if we consider one of Socrates' own observations:

> And by the Dog, men of Athens – for I must speak the truth to you – this, I do declare, was my experience: those who had the most reputation seemed to me to be almost the most deficient, as I investigated at the god's behest, and others who were of less repute seemed to be superior men in the matter of being sensible. (Plato 1914: 83, 85)

Why does Socrates find the common men superior 'in the matter of being sensible'? Probably, they did not give long speeches in which their forms of knowledge were generalized and presented as final truths of life. They probably talked the way Socrates asked follow-up questions. They commented upon the cases and aspects of things they learned to master in their special practices, but they did not pose as wise more generally just because they knew these things well. A big city such as Athens both allows and presupposes specialization: this belongs to the very concept of a city. The sprawling sub-forms of human life in a city are indispensable to the functioning of the entire city. Today, the world functions as Athens once did, and the specialized sciences are necessary components of this enormous metropolis.[41] Socrates examines the claims to general knowledge that have as their basis the unique experiences, tools and practices of more specialized ways of being. His questions take us beyond ideas cultivated in the quarters of a city, towards what all of us already are intimately familiar with simply by being humans. His questions take us into the labyrinth of human life, where the various sub-cultures certainly are included, but as ripples on the surface. What Socrates and his interlocutors already possess is no less than their own lives: difficult to survey forms of life where words such as 'courageous' and 'just' are used so creatively and variously that it is impossible to define them in unitary formulas.

Why does not Socrates (or Plato) accept that he already knows, in some very human sense, what courage or justice is? Why does he hypothesize that he knew these things perfectly *before* birth, but forgot them the moment he was born? His follow-up questions are not about pure ideas, but about life as it develops *after* birth! Socrates too demanded the general knowledge that his speechifying interlocutors talked as if they had. Socrates imposed even severer demands on intellectual generality, since he explained to his interlocutors that they had to *define* concepts in unitary formulas, containing just a few words combined in a new genre of philosophical truth telling. Intensifying the demands on generality while simultaneously diving straight down into the labyrinth of human experience, that could only lead to a grandiose failure:

> He believed that all philosophical concepts ought to be defined, but this belief expressed not an achievement but an ideal in the light of which he was forced to admit that he knew nothing except his own ignorance. (Collingwood 1933: 92)

By imposing new rigorous demands of philosophical truth telling – the invented voice of reason that defines concepts in condensed formulas – Socrates acted as a moralist subduing the most self-assured citizens of Athens. In that sense, the ignorance acknowledged at the end of many dialogues is a success for Socrates. The moralist has subdued the cockerel. But Socrates is full of contradictions and had a deeply ambiguous significance for philosophers such as Kierkegaard and Nietzsche, and probably also for the later Wittgenstein. True, Socrates' invention of reason was to a great extent a moralist's intellectual weapon:

> Plato's Socrates laughed at Gorgias for offering a whole series of specific forms of 'virtue' when asked for a unitary definition of 'virtue'; but the Socratic attempt at a unitary definition was even more faulty, neglecting as it did the specific forms of the concept. (Collingwood 1933: 102)

The Socratic discontent with the generalizations of speechifying Athenians was anything but a mistake. If we consider Socrates' practice in this light, then his demand for unitary definitions can be interpreted as a technique for making explicit the claims to general knowledge that otherwise would remain implicit in the speeches given. This technique enabled him to scrutinize the legitimacy of the claims. His demand for unitary definitions can therefore be conceived of as a demand for greater intellectual honesty. So, maybe Collingwood's assessment of Socrates'

definitions is slightly unfair, for the ancient philosopher's follow-up questions do not neglect the specific forms of concepts. The entire dialogues, with the follow-up comments, clarify concepts in the sense that they make concepts clearer than they were before the investigation. An entire dialogue, then, can be seen as 'an attempt to expound the concept in a statement which may properly be described as an extended and reasoned definition', as Collingwood (1933: 96) writes when he rejects the Socratic notion of definition and suggests a more fruitful understanding of philosophical definitions. Fruitful philosophical definitions are not unitary formulas, but extended investigations that clarify, or make better understood, what to some extent we know already. This notion of definition seems to apply to the dialogues. When we read the dialogues, the typical reaction is not absolute ignorance. We often find that the entire dialogue helps us to a somewhat better understanding, even though the new understanding is not perfect or absolute, and cannot be expressed as a unitary definition. The follow-up questions are better rooted in human reality than the unitary definitions are, and these modest questions reveal how problematic claims to general knowledge often are. 'With Socrates, truthfulness takes possession of logic: it notices the infinite impossibility of correct categorization' (Nietzsche 1995: 68).

An aspect of philosophical criticism, as practised by Socrates and most original philosophers, is that it touches us personally. Critique of culture is, ultimately, critique of the persons we would like to think we are. Wittgenstein (1969: 18) said that a source of metaphysics and the craving for generality is 'our preoccupation with the method of science'. But this suggests an even deeper tendency to generalize specific cultures and make them universally valid, a tendency to generalize our preferred cultural *personae* in certain fields at the expense of other aspects of ourselves, perhaps the most fundamental and general ones. In other words, the more we strive after the abstract universality of a mathematical or scientific theory, the more local do we become culturally. (A child's life is, in an important sense, more universal than the most abstract mathematical theory.) Philosophy is at work on our cultural identity, and in this sense philosophy takes care of our souls, even though the process often is painful. It softens our hardened adult identity, so overdetermined by what we decided to become in adolescence and thereby unable to understand what lies outside of its petrified shell.

If philosophy fails, and it often does, then the person comes out of the process even more dogmatic and narrow-minded than they entered it. But the aim is not to create a new regime of intellectual principles governing our ideas, but to make us remember life as it already is. There

is something outside of our hardened adult souls, and it is not foreign to us; in fact, nothing could be more intimately known, for we are confronted with it every day in the mere living of life. But when we try to survey these daily experienced 'forms of life', we find ourselves in a labyrinth more complicated than a human invention. We *will* not find our way, we *will* go astray, we *will* be confused, and that is a *good* sign. It shows that we are in contact with aspects of life that developed beyond conscious control, through enculturation, and that create friction for our intellect.

Philosophy is not opposed to discoveries, inventions or the elaborate cultures that we develop when we already are enculturated as humans. It just attempts to harmonize these late developments with what we already are. Philosophy adjusts the main point in our souls. And this is another aspect of the difficulty of philosophy, for nothing could be more natural for us than to put all weight on what we want to achieve in the future, and to neglect what we already are and therefore do not have to take further responsibility for. The philosopher appears otherworldly because her thinking tries to be undisturbed by practical aims and ambitions directed towards the future. The philosopher needs to remain where she already is, her desire is to 'go back to the things themselves', to use Edmund Husserl's (1970a) slogan. Or, as the Spanish philosopher José Ortega y Gasset explains it:

> The most inveterate mistake has been to think that philosophy must always discover some new reality that only appears under philosophy's lens, when the character of reality as distinct from thought consists in its already being there beforehand, in its being prior to thought. Thus the great discovery thought must make is that it is essentially secondary, the result of a preexisting, not a 'found,' reality; a reality one may even want to avoid. (Ortega y Gasset 1975: 69)

'A reality one may even want to avoid': scepticism *is* this avoidance of a primal reality. Therefore, philosophy can be understood as a fight against the scepticism that consists in exaggerating formal and technical components of human culture and suppressing more primordial aspects of life. Our cultural diagnosis of philosophy supports such an interpretation. It suggests that philosophy's famous otherworldliness can just as well be described as the opposite attitude to life. Philosophy counteracts the otherworldliness that comes with our high estimation of our intellectual activities and products: Skinner's, Chomsky's and (to

some extent) Tomasello's otherworldliness. The most esteemed products of the intellect are aesthetically elegant formal constructions that push the inventive mind to do its utmost. We instinctively generalize the intellect and demand that life should have the same schematic form as its most cherished products, and that describing life should be as intellectually stimulating as inventing a machine. Otherwise, we are uninterested, bored and perhaps even disgusted. It is like trying to make a skilled mathematician see ordinary mathematical operations, such as addition or subtraction, as interesting in their own right. It is characteristic that the mathematician finds these elementary operations interesting only if they can inspire her to invent new forms of mathematics. This practical attitude of the constantly activated mathematician makes it difficult for the human being in her to describe what happens right in front of her, when two children count their toys. She gets lost in what she invents as a mathematician who cannot turn off her professional frenzy. This rigidly practical attitude makes her otherworldly. She is always on the run. What already is there, right in front of her, lacks interest; only what is not there, and can be invented by activating her mathematical craftsmanship, is interesting.

The false idea that philosophy is otherworldly is facilitated by the fact that philosophers have characterized their attitude to life with the strange word 'transcendental'. To think in a transcendental modus is to focus on what is already the case, on what cannot be explored empirically, on what we already know, before all new discoveries and inventions. The choice of a sophisticated word such as 'transcendental' to characterize philosophy is ill-boding. It indicates that the philosopher does not fully understand her task, as when Socrates thinks that he recollects what he knew before he was born, when he actually comments on life as it developed after birth, that is to say, life as it developed through human enculturation. This is why we are helped by a cultural characterization of philosophy from a talking ape's point of view: so that life in the obvious sense we explore it does not escape us, and we think we describe 'pure ideas,' 'pure reason,' 'pure phenomena', or some other ghostlike things. If Socrates had known about Kanzi, he might have understood himself as a cultural primatologist who treated disharmonies in a culturally ambiguous primate species.

Did Nim speak?

The concentration of philosophy is analogous to that of ape language research, and the difficulties one meets are related. Both activities

require that we see the weight of our primal culture and resist the temptation to understand life purely 'theoretically' on the basis of invented concepts. The phenomenologist Edmund Husserl (1960) used a Greek word for this attitude, *epokhé*, which means suspension. He saw the difficulty of philosophy as the difficulty of exercising *epokhé*: the difficulty of suspending specialized scientific perspectives in philosophy and thereby the attitude that reality must have an intellectual design that these constructed perspectives mirror.

The spontaneous emergence of Kanzi's language taught us the importance of exercising *epokhé* in ape language research. The apparently otherworldly attitude of philosophy here made a practical difference and changed the way an organism functions. We stimulated language in Kanzi by suspending, in our interactions with him, our scientific cultures. We had to suspend them in our attempts to initiate Kanzi into language, for language is not contained in those cultures; it is contained in the culture we have when we enter those cultures in adolescence. But did we not have to suspend other aspects of our primal culture, too? Not any more than when we talk with children. And whenever we talk with someone, we suspend, often without noticing it, certain aspects of ourselves while we discover and sometimes create new unforeseen aspects (remember that life with the bonobos is on a novel Pan/Homo continuum). As we already remarked, then, scientific concepts and techniques that we learned as mature humans had to be balanced against the more general aspects of culture that we developed during the flexible period of childhood immaturity. We challenge the reader to find a case where the exercise of a phenomenological *epokhé* had a more tangible effect!

By not exercising *epokhé* consistently, Herb Terrace did not draw efficiently on the culture that harbours language. But the difference between our work and his is not as categorical as we have presented it up until now. What we have learned in this inquiry into enculturation facilitates a more balanced understanding of Project Nim. If language develops beyond conscious control, then Terrace can hardly have avoided transferring at least rudimentary forms of language to Nim. Recall Cavell's remark that the idea that we are teaching children language 'obscures both how different what they learn may be from anything we think we are teaching, or mean to be teaching; and how vastly more they learn than the thing we should say we had "taught" ' (1979: 171). Stuart Shanker (1994) draws the reader's attention to the same feature of Savage-Rumbaugh's earlier work, before Kanzi, with the chimpanzees Sherman and Austin. In *Ape Language* (1986), she remarks that

'it became increasingly apparent that they were continually learning to do far more than they were being taught' (Savage-Rumbaugh 1986: 404). The black-and-white picture of LRC research – 'before and after Kanzi' – is therefore not entirely fair. But it is because of what we have learned from Kanzi that we can see continuity in the research, and begin to understand why it is there. So, let us approach Nim and see what kind of enculturated ape he became; how humans affected him. If Nim spent four years interacting with humans, then we have reason to suspect that he acquired at least rudimentary forms of language, in spite of Terrace's et al. (1979) famous negative assessment of the project, after Terrace studied videotapes and noticed that Nim rarely initiated conversations, but mirrored the signs the teacher already had made.

It is significant that Terrace was quite optimistic during the entire project period, and noted daily linguistic interactions with Nim, but decided that the project had failed only by the end of the last year, when he was sitting in front of a TV-screen watching videotapes and writing a scientific assessment of the project. We do not doubt that Nim tended to mirror the teacher's signs, but are not surprised that he did so. That was the main kind of practice with signs he was taught in the classroom. The teacher invited Nim to make the same signs she made, often by moulding Nim's hands, and he was met with affection when he did the same signs the teacher made. Repeating the teacher's signs must have been an important form of interaction for Nim, a way of being together with humans and receiving their attention and affection. This may not have been an impressive form of linguistic interaction, but Nim used signing also outside of the classroom, in situations where he seems to have had something to say. And the humans did not only invite Nim to mirror their signs, they also used signs when they had something to say to him. These freer interactions must have affected Nim and made him familiar with at least some of the cultural practices in which human children begin to speak. Perhaps Herb Terrace in this respect can be compared with some of the sceptical caregivers who worked with Kanzi, who talked with him and told us what he said, but questioned the linguistic nature of these communications when they acted in another culture than the one in which Kanzi just recently had spoken to them.

When we re-read Terrace's book *Nim* (1979), published the same year he published the famous article in *Science*, we find it deeply ambiguous. It seems to us as if the book, and the entire project, was plagued with that antagonism between aspects of human culture that we talked about when we discussed scepticism and the nature of philosophy. There are tendencies to develop a functioning social life with Nim, where forms

of linguistic communication begin to play prominent roles. But there are also opposite tendencies, where Talbot Taylor's explanation of why scepticism seems absurd about humans – it would threaten our social life – is illustrated. The social life that Nim was in the process of developing was repeatedly shattered by how he was unintentionally treated as a research subject. We say 'unintentionally', because Terrace's original ideas were rather good, as we shall soon see. But he did not get the funding he needed, and he did not understand that the compromises this led him to would be just as fatal for Nim, and for his ability to talk with humans, as a sceptical attitude would have been if it were realized in practice. Moreover, Terrace tended to interpret even his good hunches somewhat technically, and this diminished their value in the project.

Terrace's original idea was not that he would teach Nim language in a tiny classroom. He explicitly rejected the dissociation of language from social context that characterized earlier ape language research:

> My plan for teaching Nim to use sign language called for raising him as a human child in a human family . . . I hoped that Nim's motivation to sign would be similar to a child's motivation to talk: not just to communicate his feelings and desires, but to please his family and to share his perceptions of the world. (Terrace 1979: 5)

Terrace here expresses his intention to place an important component of the project outside of the controlled sphere that he mastered as a remarkably skilled experimental psychologist. He expresses his hunch that in order to transfer language to Nim, he had to temporarily suspend experimental psychology, and leave an essential part of the project to what might hopefully happen between Nim and a few humans with whom he would live. Terrace expresses the need to exercise *epokhé* in Project Nim, also when *describing* vital aspects of the project:

> Because of their subjective nature, important details of Nim's socialization cannot be described properly in the objective terminology of the 'method' section of a scientific article. They require an understanding of the human setting of the experiment, of the people who took part in it and the places in which they worked. They also require some understanding of Nim's personality, as elusive and complicated as that of any human child. (Terrace 1979: 5)

In this valuable remark on the nature of ape language research, Terrace touches what we call culture. *Nim* is an autobiography that describes

four years of Herb Terrace and Nim's lives together. It is noteworthy that Terrace, in order to communicate the total picture of Project Nim, had to complement his scientific report in *Science* with a book written in the form of an autobiography. We happen to think that Terrace's book is scientifically more valuable than the article, since the book does not suppress the real social dynamics of the research. In our view, the book provides the scientific community with the most truthful and balanced report of Project Nim. Fox and King (2002) and King (2004) make a similar argument about the way primatologists often reduce ape culture to a list of traits abstracted away from ape social life. The famous Whiten et al. (1999) article in *Nature* has come to represent the ultimate word on ape culture, to the exclusion of detailed monographs from the field.

In line with his social diagnosis of how a child begins to speak, Terrace's intention was to teach Nim sign language in the same human environment in which he would be socialized, as part of his socialization (Terrace 1979: 48). That was his original intention, but things did not go as Terrace planned. Nim's human mother, Stephanie LaFarge, declined to work as Nim's main language teacher, and his education therefore had to be placed somewhere else than in Stephanie's home. Where? In the bare and small classroom! How could Nim end up being taught signing in a small classroom, given Terrace's original intentions? Partly because of factors that Terrace could not control, for instance, Stephanie LaFarge's choices about how to live her life. But should not Terrace have understood that trying to teach Nim language in a bare classroom would be fatal to his linguistic development, since Nim did not yet speak at all? Terrace's failure to understand how fatal his choice was to educate Nim in a classroom exemplifies the value of a catalogue of design features of language in its cultural dimensions. Terrace may have seen a connection between socialization and language development, but this connection was for him merely external. He did not see that the two processes coincide, and that he had to re-think his *concept* of language. In spite of his insights, Terrace thinks of language in terms of sentences and other forms of expression, as if our first language was the same kind of thing as a demarcated second language, and only needed social driving forces to develop. He believes that a child's motivation to learn such a demarcated medium (for example, ASL) stems from becoming socially bonded with humans and wanting to share perceptions with them. This idea made Terrace believe that socialization and language teaching could be carried out separately: Nim lived in a human home, was taken to school in the morning, and then delivered home again in the evening, as if he were a seven-year-old boy who

already spoke, but needed to learn a foreign language to speak with his human host family.

Our interpretation, then, is that what Terrace saw Nim do on the videotapes – mirroring the teacher's signs – reflects how he interfered with Nim's language development by trying to educate Nim in a classroom. Terrace understood that Nim should be socialized in someone's home, but believed that language had to be taught through special training; preferably in Nim's home, but if that turns out practicably impossible, then a classroom will do. But why a bare room? Because Terrace's notion of language was an abstraction from the tools, practices, forms of interaction and other contents of culture that children acquire when they begin to speak. He thought it was sufficient that socialization at home created a desire in Nim to learn language, a desire to create sentences. So, in the classroom, distracting life was filtered out and all efforts were concentrated on teaching Nim new signs. But Nim did not know how to act as a language student for he had no primal language where the signs he was taught could be used. The activity of repeating the teacher's signs in the classroom was for him probably often simply a further way of socializing with humans. What Terrace saw on the videotapes was a poor Nim who perhaps did not always use signs to talk, but who at least used them to interact socially. Nim's behaviour on the tapes might be compared to how children sometimes face each other in the schoolyard and gesture while saying jingles. Terrace's attempt to teach Nim language in a classroom violates the design features of language. What he saw on the videotapes were consequences of this violation.

We now turn to the really interesting part of our assessment of Project Nim. Terrace may have violated the design features of language by trying to teach Nim language in a classroom, but he was just as familiar with these features as any other human being, and he can hardly have avoided them completely. They belong to our most fundamental and self-evident ways of moving, gesturing, acting and reacting to each other. They are inscribed in our bodies, physiognomies, gestures, tools, practices and milieux. Recall that the catalogue of design features is meant as a *reminder* of features of language with which every speaking human being already is intimately familiar. Terrace's book contains an abundance of striking examples that we could have used when we developed the catalogue. Here, for instance, is Terrace's observation of the design feature that we call 'flexible interface of primate interactions':

> Few people have an opportunity to express their personalities to a chimpanzee. If they did they would discover, as did I and many members of Project Nim, that a chimpanzee is also capable of discerning the moods of human beings. Indeed, given the mutual sensitivities of humans and chimpanzees and the many similar ways in which they express themselves, it often seems surprising that special training is needed to teach a chimpanzee to communicate via a natural language. (Terrace 1979: 85)

We have three comments to this statement. The first is that Terrace here clearly expresses his opinion that language is a demarcated medium ('via a natural language'). He does not see the cultural dimensions of language. The second comment is that Terrace obviously did not trust his own hunch that chimpanzees might acquire language spontaneously. He did not give up his professional control over Nim's language and therefore did not try the possibility that a chimpanzee *can* develop language without special training. The third comment is that Terrace here describes what happened every day in Nim's life. Nim met humans who interacted with him every single day of his life. They spoke to him within primal language activities, and reacted to fine details in Nim's physiognomy and behaviour. These interactions must have developed the 'interface' that Terrace describes above (without using that word), towards what is recognizable as language. Even though Terrace did not give up his control over Nim's language, then, the most immediate aspects of how he acted together with Nim were beyond his professional control. Simply facing Nim activated these ways of acting and speaking. It is virtually impossible to *avoid* talking and gesturing when you are with an ape who is trying to interact with you. These inevitable spontaneous communications appear to have changed the interface, and Nim soon understood more signs than he expressed (Terrace 1979: 164). Savage-Rumbaugh had the same experience with Kanzi: the interface changed. Kanzi began to respond appropriately to her words when they did things together.

Terrace's book is full of descriptions of Nim's mastery of language. Why do so few see the weight of these observations? Why is an article in *Science*, where it is explained how Nim tended to mirror the teacher's signs, treated with such respect and kept alive in everybody's memory, when Terrace also published a book the same year that demonstrates, page after page, how Nim used signs to communicate, especially when he was allowed to use signs freely while doing things he enjoyed:

> When he was allowed to help, he was not only much better behaved but he also was likely to engage his caretakers in conversation. Often he would sign *give me* to his caretaker to obtain some clothes to put into the washing machine. At the washing machine Nim would sign *open*, and then, having helped to load the machine, he would sign *wash* or *give wash* in order to get some soap powder to pour into the machine. (Terrace 1979: 76–7)

In situations where he was allowed to help, Nim 'was likely to engage his caretakers in conversation'. Why? Probably because, in these situations, he had something to say to them! Had Nim been filmed while he was doing something that engaged him, something that 'distracted' him from what many theorists believe language *must* be, then his primal language could have become more visible on the tapes, at least if we can trust Terrace's own description above. One would like to see a Nim who did not just sit still on the ground trying desperately to respond to what the teacher is doing with her hands, but who was engaged in mobile activities with humans. There was such a Nim:

> An ideal environment for Nim, both from his and from his teacher's points of view, was one in which he could satisfy his curiosity about the world in ways that were not destructive. Indeed, a good teacher could be defined as one with the imagination and the wherewithal to create such an environment. The reward for such efforts was access to what was, from my point of view, the most fascinating aspect of Nim's personality: his desire to explore, to manipulate, and to communicate about his environment. (Terrace 1979: 109)

Thus speaks the person who tried to teach Nim language in a bare classroom! What Terrace describes here is the kind of enriched environment that we created at the LRC; an environment which activates those difficult-to-survey aspects of our ways of being that harbour language. There is a gulf between the person who wrote the words above about Nim's ideal environment and the experimental psychologist who judged that Nim merely mirrored the teacher's signs. Terrace acts and thinks on different cultural levels, and this fact makes his work tremendously interesting.

Terrace's professional assessments of photographs and videotapes are sometimes a bit absurd. For instance, he holds it against Nim that when Nim is signing *black*, the teacher is signing *What's that?*, and that when Nim is signing *Nim*, the teacher is signing *Who?* Nim is evidently

answering the teacher's questions, but for Terrace (1979: 219) this exemplifies the influence of the teacher's signing on Nim's signing! What should Nim do to satisfy Terrace in his capacity as an experimental psychologist who wants a watertight proof that Nim has language? Sign randomly without any connection to what the teacher is signing? Should he suddenly sign *pink*, as Steven Pinker is so impressed his two-year-old niece Eva did upon seeing a pink neon sign: 'She was commenting on its color, just for the sake of commenting on its color' (Pinker 1994: 373). Maybe she was, but why should that be more impressively 'language-like' than conversing with a fellow-creature and signing *black* in response to a question?

Terrace's 'objective assessment' of Nim's language becomes even more mysterious when Nim does what Terrace demands of him, namely, takes initiatives in conversation. His analysis of these events is that Nim interrupts his teachers more frequently than a child interrupts her parents (Terrace 1979: 219). Nim probably had more reasons to interrupt his teachers than a child has to interrupt her parents – although interrupting others is a frequent activity among children. And in interrupting his teachers, Nim tried to take the lead in the conversations. What would have happened if Nim's teachers listened to him and continued the conversation along the lines suggested by Nim? What would have happened if they asked him further questions about what exactly he wants? The answer can be found in Terrace's own book:

> Instead of mechanically taking the picture book away and substituting a new activity, say, drawing, Laura would question Nim as to what he wanted to do next. More often than not he would reply that he wanted to play in the gym next to the classroom or that he wanted to be tickled. Rarely would Nim sign that he wanted another book or that he wanted to draw. Laura didn't always gratify his wish immediately, but at least showed interest in his preference. If play or tickle wasn't imminent, Laura would sign *later*, a concept that Nim readily understood. (Terrace 1979: 81)

Laura Petitto seems to have been an unusually sensitive and talented caregiver. Judging from what Terrace says about her interactions with Nim, the *tempo* in which she interacted with him, and anticipated and showed interest in his behaviour, made talk about the future well-functioning. Displacement emerges in Nim's language because a caregiver is able respectfully to place the sign *later* in a cultural activity in which she engages Nim: that of waiting and trusting what is to come.

If teachers generally had paid more attention to what Nim said, we believe that an intermediary ape/human culture could have developed with more space for Nim's language development.

Project Nim is ambiguous, then, and our previous black-and-white picture is true only of a tendency that happens to be evident in the project. But there is also another and more difficult-to-understand tendency, one that is closely related to our work at the LRC, and that we think must have meant that forms of our primal language emerged in Nim's interactions with humans. These forms may be mixed up with, and even torn apart by, other elements of his behaviour that developed because he was treated as a research subject and as a language student. Yet, aspects of language must have been discernible in Nim's behaviour, and as we have shown, Terrace's own book contains many examples of Nim signing in cultural dimensions. Consider, as a further example, this situation in which Nim really needed to convey his meaning. When the project was over, Terrace could no longer keep Nim and it was decided that Nim be transferred to the Institute for Primate Studies in Oklahoma. Making Nim enter the new building and his new cage was not an easy matter:

> I decided to see if Nim would take the initiative and try to explore this strange building on his own . . . I asked Joyce, Bill, and Mary to sit with me inside the building just outside Nim's cage. Nim stayed outside the building and signed to us *come*, *play*, and *there*, pointing away from the building. (Terrace 1979: 202)

Thus ends *Nim*, with Nim demonstrating the design feature of gestures, just as Kanzi did when he wanted the key to see Matata. The fact that Terrace wrote *Nim*, the autobiography, indicates that he felt a need to affirm those primal aspects of life that contained the traces of language that Nim after all developed. He could have done excellent work on language in nonhuman primates if he had had the required funding and understanding support, and not least the time needed to clarify these philosophically difficult matters for himself: 'Dwelling on Nim's linguistic progress was, unfortunately, a luxury I could not afford' (Terrace 1979: 62). Terrace had many good hunches. Just consider his criticism of an idea of one of his co-workers to teach Nim new signs in only one kind of context, as if all signs functioned as proper names:

> Such a restriction might do in the case of concrete objects and people, but much of the vocabulary we tried to teach Nim included signs

> that, of necessity, referred to relationships, feelings, and actions. In each case, these signs applied to a widespread set of conditions. How could we possibly teach signs such as *open*, *in*, *more*, *hug*, and *sorry* in only one context? (Terrace 1979: 61)

On the basis of his familiarity with linguistic phenomena as they exist independently of the tempting identification of language with its written or spoken surface, Terrace here expresses an important feature of language. What confused his co-worker was, one might say: 'the uniform appearance of words when we hear them spoken or meet them in script and print. For their *application* is not presented to us so clearly' (Wittgenstein 1953: 11). We tried to make the significance of this variety of word usages more evident by expressing it as a number of design features of language. Recall Panbanisha's two responses to the requests, 'put the rubber band *on* the big lexigram', and 'put the rubber band *on* the doggy'. She put the rubber band on the dog as if it were a collar. This may not have been the experimenter's intention in the test, but that just shows that Panbanisha's language is rooted in another culture than the simpler and more uniform practice in which the experimenter momentarily acted.

We hope this section made it evident that Project Nim was not that deathblow to ape language research that many assume it was. Project Nim was deeply ambiguous, and everyone who thought Herb Terrace said the last word about ape language research in *Science* should not forget this assessment of Project Nim, made by the same person in the same year, in a book that we would classify as an autobiography:

> Because I cannot overlook what Nim learned about sign language under conditions that were far from ideal, I feel confident that Nim's impressive achievements will not prove to be the last word. (Terrace 1979: 227)

Kanzi, Panbanisha, Nyota and Nathan demonstrate that Nim's achievements were not the last word. Now we want to explore how our work prepares the ground for future studies of language.

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4
What Does It Mean to Study Language?

> *'How does the partisan of absolute reality know what this orders him to think? He cannot get direct sight of the absolute; and he has no means of guessing what it wants of him except by following the humanistic clues.'*
>
> William James

A question of scientific relevance

The rapid development of the biological sciences during the past decades is to a large extent due to new forms of specialized research work. Molecular biology and genetics would disintegrate without the continually updated technologies, skills and forms of knowledge that biologists in various fields develop and share with colleagues and students, but not with the rest of us speaking humans.

Even though our work advances by avoiding specialization, by suspending what is not generally human, we see our studies of ape language as relevant for the possibility of well-founded research into the biology of language. The question we investigate in this final chapter is in what sense our non-specialized studies are biologically relevant, when the natural sciences normally advance through specialization. How, in short, are philosophical explorations of language in cultural dimensions scientifically relevant?

Is a technical notion of language one notion or two?

We investigate the scientific relevance of our work by scrutinizing an opposed and very influential attempt to study language scientifically. The linguist Noam Chomsky would probably see our philosophical

studies of language in this book as less significant from natural-scientific points of view, precisely because they are intended to remind us of the ordinary:

> every serious approach to the study of language departs from the common-sense usage, replacing it by some technical concept. (Chomsky 1996: 559)

We agree with Chomsky that many serious approaches to the study of language depart from the common-sense usage by employing technical notions of language. But if our catalogue of design features teaches us a lesson, it is that it is not an easy matter to identify language in ordinary experience. It may require an unexpected event, such as Kanzi's spontaneous language acquisition, and hard philosophical reflection, to rediscover what is hidden because of its obviousness. Does Chomsky know what 'the common-sense usage' is? Is he aware of what he is dismissing?

Chomsky's dismissal of 'the common-sense usage' is not the result of scrutiny of ordinary ways of experiencing language, for it is such inquiry that he dismisses as non-serious. The dismissal is categorical. It is an unconditional attitude to science and its place in human life. A noteworthy consequence of Chomsky's attitude to the ordinary experience of language is that only someone who is able to mean by 'language' what hitherto no human being has been able to mean, is able to address seriously questions of language. This sounds paradoxical in our ears, for we want to ask: questions of language *in what sense*? What can Chomsky mean by a technical notion *of language*? Is it a notion that is inaccessibly technical, and yet about what we ordinarily know as language? Or is it a notion that is technical, and therefore about language in the same inaccessible sense? Do we have one notion here or two notions in an implicit combination? Can it be the case that even technical notions of language presuppose aspects of our common experience of language, namely, in order to be technical notions *of language*? If the contrived concept is wholly unrelated to language – to our common human experience of language – is it possible to see the new concept even as an *invented* perspective on language? Is it not then merely another formal invention; one that is not 'about' anything other than itself? Specialized science may in an important sense presuppose our human forms of life – as we elucidate them – in order to be 'about' aspects of life.

The introvert character of Chomsky's notion of language

Chomsky has changed his views on the choice of the proper technical notion of language in linguistics. He now adopts what he calls an internalist perspective, and identifies language with what he previously called grammar, although the notion of grammar too is somewhat different, due to the relatively new Principles-and-Parameters approach. Chomsky designates a language, in the new technical sense, an I-language. An I-language is meant to be a biological system, a subcomponent of human brains, which assigns phonetic and logical form to utterances:

> The I-language is what the grammar purports to describe: a system represented in the mind/brain, ultimately in physical mechanisms that are now largely unknown, and is in this sense *internalized*; a system that is *intensional* in that it may be regarded as a specific function considered in intension . . . which assigns a status to a vast range of physical events. (Chomsky 1996: 562)

Our question is how this technical concept can be conceived of as a notion of language. Given Chomsky's stated determination to *replace* our ordinary sensibilities to linguistic phenomena by the specialized considerations of his technical perspective, we wonder if not the letter 'I' suggests one further aspect of the I-language, namely, its intellectually introvert character, which might undermine its status as a technical concept *of language*.

A technical concept can be introduced by saying, 'in this study we consider language to be . . .', and then follows a characterization of the technical concept. This way of introducing technical concepts is based upon previous acquaintance with language as distinct from the technical notion. Otherwise, the clarification becomes a tautology. A technical concept, therefore, is an imposed perspective. It is an imposed way of looking at what we already know in a different manner. In his early work, *Syntactic Structures* (1957), Chomsky first seems to be aware that he is imposing a technical perspective, for he begins cautiously by saying:

> From now on I will consider a *language* to be a set (finite or infinite) of sentences, each finite in length and constructed out of a finite set of elements. (Chomsky 1957: 13)

That is well put, for in that work Chomsky *considers* our already experienced language to be what it is *not* experienced to be, namely, a formal language. He imposes such techniques of representation on what is already language. It is, of course, possible to view his statement as a stipulation, with no intended connection to language in any already known sense. But given what Chomsky says next, he treats it neither as a clarification of how he chooses to study language, nor as a stipulation concerning his future use of the letter combination 'l-a-n-g-u-a-g-e':

> All natural languages in their spoken or written form are languages in this sense, since each natural language has a finite number of phonemes (or letters in its alphabet) and each sentence is representable as a finite sequence of these phonemes (or letters), though there are infinitely many sentences. (Chomsky 1957: 13)

Chomsky treats his clarification, or technical definition, as a discovery of what language already is: all natural languages *are* languages in the technical sense. But this 'discovery' is a *reassertion* of the technical perspective, a further illustration of the formal and grammatical way of *viewing* language, for only within such a representation does it make sense to say, 'there are infinitely many sentences', in a mathematical sense, or to say that 'each natural language has a finite number of phonemes'. In our view, Chomsky's statement omits the following elements, presented below in square brackets, of what he is doing in actual fact:[42]

> From now on I will consider a language to be [its formal representation in linguistics:] a set (finite or infinite) of sentences [formulas], each finite in length and constructed out of a finite set of elements. All [formal representations of] natural languages in their spoken or written form are languages in this sense, since each [phonemic representation of a] natural language has a finite number of phonemes.

In his capacity as theorist of language, Chomsky resembles a busy spider whose constant activity makes him unable to acknowledge the tree that supports his work, and without which his web would fall to the ground. The quoted passages from *Syntactic Structures* show Chomsky wavering between presenting his technical work as an imposed perspective on language and as the discovery of what language already is. In the latter case, Chomsky reasons normatively, as if the ordinary experience of lan-

guage were just 'appearance' and not 'reality', as if we had only one proper notion of language: the technical one. He reasons as if once the technical concept is attained, we could throw away our familiarity with language as common human phenomenon, as if it were a temporary ladder we no longer need. It is as if a spider thought that when his web was finished, he could throw away the tree.

The same wavering reappears in Chomsky's more recent arguments for an internalist perspective on language (see the collection of essays in Chomsky 2000). It is virtually impossible for the reader to decide if Chomsky's fundamental claim is that he *postulates* the notion on an I-language in the brain, or if he has *discovered* that there must be such a mechanism in the brain, or if he *postulates that it will be discovered in the future*, or if he has *discovered that it will be discovered*.

This ambiguity in Chomsky's attempt to construe language as a biologically real entity makes it all the more important for us to take seriously what Chomsky takes less seriously, namely, inquiry into the relation between the technical notion of I-language and language as we already experience it. But first we must observe that Chomsky would not claim that natural languages in their spoken or written form are I-languages; on the contrary, he separates them sharply:

> There is nothing intrinsic to the I-language that tells us that it should be taken to be a language. Some other organism might, in principle, have the same I-language as Peter, but embedded in a performance system that uses it for locomotion. (Chomsky 1997: 119–20)

What Chomsky says here is that an I-language might, in some other creature's brain, be unconnected to linguistic phenomena, and instead to activities such as crawling, walking, running and jumping. But if I-languages are so removed from what we ordinarily experience as language, how can studies of I-languages be conceived of as language studies in a sense that speaks to humanity? Presumably, I-languages must, according to Chomsky, stand in some relation to what we already know as language, but what relation? Chomsky continues the passage just quoted by saying:

> We are studying . . . a human being, whose I-language happens to be integrated into performance systems that yield such actions as articulation, expression of beliefs and desires, referring, describing and so on. For such reasons, our topic is the study of human language. (Chomsky 1997: 120)

This is Chomsky's formula for how linguistic phenomena are related to the technical notion of I-languages:

> *language as we already experience it is caused by language in the technical sense, through the mediating activity of certain performance systems*.

Is this formula trustworthy? Chomsky is forced to operate with two notions of language. One is technical, with no essential relation to language as common human phenomenon. The other notion he takes to be language in the common sense. But since Chomsky explicitly declares that he is not seriously interested in exploring the ordinary experience of linguistic phenomena, can we trust his ability to identify language in human life and establish connections that would make the I-language a technical notion of language? Is Chomsky sufficiently interested in language to establish even a technical notion of language? Has he achieved a concept of a biologically real entity, or rather a concept of the concept itself?

The avoidance of experiential friction in Chomsky's thinking

Our approach to language consists in facing experience and using it as a touchstone of our ideas about language. We meet the bonobos and talk with them every day, and are drawn into daily linguistic dramas that we believe help us clarify what language is. The moment that we discover a new linguistic trait in the bonobos – an empirical finding – we rediscover that trait as a neglected aspect of the language we already have as speaking humans – a conceptual clarification. Ape language research enhances experiential friction in the study of language, and it combines empirical work with conceptual clarification.

A large proportion of Chomsky's ideas appear to be governed by an opposite goal of avoiding experiential friction, and of postponing conceptual questions to the future:

> questions of conceptual clarity are often premature, and can often be approached and settled only as research progresses without too much concern about exactly what one is talking about. (Chomsky 1996: 559)

The conceptual clarity that Chomsky says might be achieved by future research is not of the kind we are asking for. He is not talking about the

relation between his technical notion of language and actual experiences of linguistic phenomena. He is probably thinking of the discovery of DNA and similar scientific events, and thereby of future confirmations of his theory by neuroscientists who (might) discover the precise physical mechanisms in the brain that constitute an I-language. But our question is if we have good reasons to suppose that *this* technical notion is worth pursuing as a hypothetical notion of language that might be confirmed by future research, or if we are wasting our time, since the technical notion seems unconnected to our present experience: our only guideline, if we humbly accept the basic fact that present life is the life we have. The discovery of DNA was not preceded by pure theory, invented centuries ago by some exceptionally brilliant mind. It was preceded by steadfast experimental work, into which continually updated theoretical notions were incorporated. Theoretical work was shaped and refined by the friction of experimental labours, and the entire institution of genetics became interlaced with our common world of plants, insects, animals and humans, where phenomena of inheritance occur. Scientists can reasonably await future confirmations of hypotheses, sometimes even wild hypotheses, because they are placed in well-integrated research practices, and can make sound judgments about the future. Is Chomsky in the position to make such judgments? The future research that might reveal that I-languages are real, and not just meant to be real, appears abstract and wishful, and not as that determinate future that experienced neuroscientists already can see opening itself before them, the coming five or perhaps ten years.

Chomsky might seem to offer neuroscientists and geneticists precisely what they need, if they are interested in language; namely, a notion of language as part of the natural world, a notion of language as a biological entity (see Chomsky 2000: 106–33). But the natural sciences advance not only by discoveries of new protein functions or neural mechanisms. Such findings make little sense, even to the specialists themselves, if they have no idea about how to relate the findings to other experiences, and ultimately to life as ordinarily experienced by humans. Notions of genotypes presuppose notions of phenotypes. It makes little sense to talk about a gene for schizophrenia if you have no idea of what schizophrenia already is among humans and can relate this complex phenomenon to what you find in the laboratory. Genetics proceeds not only by discoveries in the laboratory, but also by the ongoing work of relating the findings to human experience, as it can be broken down, clarified and defined for the purposes of research. And then it might turn out that the original definition of the phenotype was too

simple, schizophrenia might not be a unitary phenomenon, but several kinds of phenomena related to each other in many different ways. Research proceeds not only at the level of technically defined natural objects, then, but also at the level of life as lived by humans outside of laboratories. This is a distinctive feature of modern natural–scientific practice that Chomsky systematically neglects.

Neglect of the task of clarifying ordinary linguistic phenomena belongs to the heart of Chomsky's theorizing. An example is his famous dichotomy between competence and performance. Chomsky emphasizes that idealization is necessary if linguistic theory is to achieve intellectually interesting accounts of language. In *Aspects of the Theory of Syntax* (1965), he writes:

> Linguistic theory is concerned primarily with an ideal speaker–listener, in a completely homogeneous speech-community, who knows its language perfectly and is unaffected by such grammatically irrelevant conditions as memory limitations, distractions, shifts of attention and interest, and errors (random or characteristic) in applying his knowledge of the language in actual performance. (Chomsky 1965: 3)

This strikes us as alarmingly similar to saying that research on schizophrenia is about an ideal schizophrenic, in a homogeneous group of identical schizophrenics, who has perfect schizophrenia unaffected by other diseases, previous history, and who quite simply reveals the platonic essence Schizophrenia. It seems that such research could only proceed from an idealization and end up in the same abstraction. It shuts the door to experiences that might reveal that schizophrenia is not a unitary phenomenon. Yet, in the case of language, it is how science, according to Chomsky, must proceed:

> We thus make a fundamental distinction between *competence* (the speaker–hearer's knowledge of his language) and *performance* (the actual use of language in concrete situations). Only under the idealization set forth in the preceding paragraph is performance a direct reflection of competence. In actual fact, it obviously could not directly reflect competence. (Chomsky 1965: 4)

Linguistic theory, then, is about an idealization called competence that, being an idealization, cannot be experienced except, perhaps, by future neuroscientists. Yet, contemporary linguists already know pretty much about it, because they can idealize, and then theorize about the necessary design of the idealization.

Normally, we say that an idealization lacks exact counterpart in reality, for it involves a substantial amount of creative joy. That is why it is called an idealization: it is not real. We take the liberty of idealizing, of disregarding reality in various respects, in order to achieve simple, uniform and perhaps useful constructions, for example, technical concepts that can be integrated into human life (applied science). Chomsky understands idealization in the opposite way. Idealization takes us straight up to reality in the highest degree. It helps mortals see, or at least postulate, a perfect system that indirectly – through the mediation of performance systems that destroy the purity of the underlying perfect system – contributes to our linguistically impoverished talk in ordinary life. Language as common human phenomenon is, from the perspective of the postulated invisible ideal, hardly language at all.

Chomsky perhaps thinks of attempts in chemistry and physics to explain phenomena by assuming hidden mechanisms. But these models are developed in parallel with exploring the phenomena. This is a frustrating dialectic where the inventive mind repeatedly is called back to the drawing board by the friction of a reality that obstinately reveals itself in continuous experimental work.[43] The aim of the dichotomy between competence and performance, however, appears to be to postpone that dialectic to future research, at least in language studies. Tedious empirical studies may be relevant in other fields, but, in the case of language, Chomsky seems to think the distance between underlying reality and actual experience is so great that we have to thoroughly idealize our way to underlying reality. He sometimes even suggests that the relation is a *mystery*, a technical term that means that a problem transcends even future research, since it lies beyond reach of 'the science-forming faculty' (Chomsky 2000: 82–3, 133). Chomsky assumes the façade of natural–scientific explanation, the use of abstract theoretical models, but it is difficult to say if he is just hiding behind it, conferring on himself rights to speculate that other scientists do not have.

Chomsky's dichotomy between competence and performance corresponds roughly to the Cartesian mind/body dualism; it is what Chomsky introduces *instead* of the mind/body dualism to downplay the importance of experience. It is therefore not surprising that the competence/performance nexus appears as mysterious in his thinking as the mind/body nexus did in Cartesian thought.

Real systems versus mere evidence

What governs the development of Chomsky's linguistic theories, if the normal dialectic between theory and experience is postponed to future

research? Chomsky's overall picture of language has a simple hierarchic structure. The picture contains three levels of order and unity. On the lowest and most chaotic level, we find the impoverished data of linguistic performance. The facts at this level are not completely disorderly, but their fragmentary order would not be there at all, according to Chomsky's style of thinking, unless these scattered phenomena were (indirectly and perhaps mysteriously) caused by mechanisms at a higher and more unitary level of generality: the level of the I-language (what he previously called grammar, competence and so on). But even the level of the I-language is imperfect, since there are as many I-languages in the world as there are mature human brains. When we compare I-languages – in idealization, of course, since they are beyond present human experience – we can once again begin to discern certain patterns that would not be there, according to Chomsky's style of thinking, unless they were causally determined by mechanisms at an even higher and more unitary level of generality, that of the principles and parameters that specify what it is to be a human language and that are studied by universal grammar.

This intellectual architectonic, that Chomsky thinks we must assume in the study of language, governs his thinking. Early in his career (Chomsky 1959) he argued against B. F. Skinner that the first level was not the proper level at which to define and study language, and ascended towards the second level, that of the more perfect order of the grammar of specific languages, with English as a standard example. But he soon began to emphasize the third level of universal grammar, what all languages have in common, and today virtually all his work is done at this most idealized level of linguistic generality and unity. Experience may play subordinate roles in Chomsky's development of theories, but there is no lack of purely intellectual forces governing his thinking, for he has strong demands on the architectonic of a satisfactory theory, and these demands constitute the dynamics of his thinking.

Chomsky's ascending movement towards more uniform and potent levels of generality, within a basically grammatical outlook, makes it easy to translate his critique of behaviourism into the language of Plato's simile of the cave. In this translation, people like B. F. Skinner, and perhaps W. V. O. Quine, are fettered in the dusky underground cave, with their backs to the cave's sloping entrance. Their tragic mistake is that they take the disorderly shadow pictures on the wall before them for reality. They lack a sense of an order of ascendancy of all things real, where what is more general and ideal (from an intellectual point of view) is also more real and potent. But there is no fire, sun or other

source of light in Chomsky's modern version of Platonism. Instead of the sun, Chomsky speaks scientifically of the initial state S_0 of the human language faculty, which is the hidden causal source of all fragmentary order discernible at the shadowy level of linguistic performance. Only linguistic theory that connects the grammar of a natural language to this ultimate source of linguistic order is *explanatory adequate* (Chomsky 1965: 18–27; 2000: 7–8). Only such theory is potent theory, since it relates linguistic phenomena to their ultimate causal source.

If we are to believe Chomsky, then, it is because S_0 shines over humanity that linguistic shadows flutter in the cave of human experience. It is because S_0 sparks deep inside the child's brain that she can develop an I-language, although the use of language that she experiences in her interactions with parents and other prisoners in the cave of human life hardly is language at all. The absurdity of behaviourism, according to Chomsky's picture, is that it fails to see the necessity of postulating S_0, and attempts to define language and study it at the level of mere linguistic shadows. The even greater absurdity of ape language research is that it looks for linguistic phenomena in a world without linguistic sun, in a world of linguistic darkness. Ape language research, according to Chomsky's picture, looks for language where not even the shadows of language are found.

But what if an ape did acquire forms of behaviour that resembled human language use? Would it not be useful to study that ape more closely, how it acquired the behaviour, what its interactions with humans look like and the precise extent to which they correspond to human language use? Would not such studies be highly appropriate, if we are interested in notions of language that reflect facts of nature, and not just our intellectual demands on what language *must* be? Chomsky's pyramid of ascending orders of linguistic reality would immediately fall over that poor ape. It cannot be language, for there is no language faculty inside ape brains, no S_0 that can develop into an I-language. The ape's language-like behaviour is no more than a shadow of a shadow, even further removed from potent linguistic reality than is human language use, which also is impoverished and far removed from absolute reality, according to Chomsky's ranking-list. Whatever it is the ape is doing when it is interacting with humans, it does not originate in some ape-version of S_0, and therefore it cannot be linguistic behaviour. This is just a reassertion of Chomsky's postulates, and they begin to sound hollow when they are used to wave aside unexpected empirical findings.[44]

Chomsky's desire for systematic unity, beyond the impoverished order of human life, becomes even more marked when he discusses Ludwig Wittgenstein's *Philosophical Investigations* (1953). Wittgenstein's work is intended as a collection of non-technical reminders of aspects of human experience that we are almost bound to over-simplify when we consciously try to form condensed unitary concepts of them. Expressed in terms of our presentation of the Socratic dialogues, Wittgenstein's investigations are guided by follow-up questions that take us into the labyrinth of human reality as it developed through human enculturation. Such work requires that we suspend idealization since it would disregard the complexities we need to unravel in spontaneously acquired forms of life. Considering Chomsky's bewilderment when he reads Wittgenstein, it seems he does not even suspect that the philosopher already knows the will to idealize, and treats it as perhaps the main problem of philosophy:

> There is a curious frustration in the attempt to explore and understand Wittgenstein's thought. His examples and remarks, often brilliant and perceptive, lead right to the border of the deepest problems, at which point he stops short and insists that the philosopher can go no further. (Chomsky 1969: 280)

Wittgenstein's remarks would not be so brilliant and perceptive had he not known the will to idealize from his own experience, and had not the point of his later work been to counteract idealization by describing forms of language use in striking detail, as we already know them in the mere living of life, but often fail to do them justice in the theorizing of life.

Chomsky reads Wittgenstein with the picture in the back of his head that potent reality is hidden: that it *must* be hypothesized, and discovered only by future research (unless it lies mysteriously beyond reach of the science-forming faculty). This picture makes Wittgenstein's emphasis on present experience seem absurd. In Chomsky's eyes, Wittgenstein resembles someone who has found a treasure chest, but shows no curiosity about its contents. But Wittgenstein knows Chomsky's picture of a hidden treasure, and describes it eloquently when he discusses his own tendencies as a young logician attempting to define the logical order of language:

> But this order, it seems, must be *utterly simple*. It is *prior* to all experience, must run through all experience; no empirical cloudiness or

> uncertainty can be allowed to affect it. It must rather be of the purest crystal. But this crystal does not appear as an abstraction; but as something concrete, indeed, as the most concrete, as it were the *hardest* thing there is. (Wittgenstein 1953: 97)

Chomsky lacks distance to this picture of a hidden absolute order of things. It is what he activates the moment he starts thinking. Therefore, the later Wittgenstein's philosophical determination to face human reality and not hide from it in some idealized conception (as he did as young logician), is for the cognitive theorist an incomprehensible 'deadening limitation', and he speaks of Wittgenstein's 'curious, and I believe stultifying, decision to concentrate on evidence . . . putting aside the question of what the evidence is evidence for' (Chomsky 1969: 281).

Wittgenstein's vivid descriptions of language in cultural dimensions can be useful as evidence, precisely because they try to be faithful descriptions of our actual experience. But Chomsky's aim with distinguishing between evidence, and what the evidence is evidence for, is to downplay evidence as impoverished and largely irrelevant to the serious study of language. Like an intellectual space shuttle, he ascends towards the real system S_0, the *sine qua non* of explanatory adequate language theories, since evidence is evidence only by being (indirectly) caused by this potent reality. Chomsky is so certain of what the evidence *must* be evidence for, that he puts aside the question of what the evidence, if studied more closely, actually *might* be evidence for. Evidence, then, does not guide Chomsky's work, and he would even see it as intellectually non-serious to take evidence seriously, since his notion of seriousness is technical and determined on the basis of a dichotomy between real systems and mere evidence. There is no fruitful communication between evidence and what the evidence is evidence for in Chomsky's version of science. There is a veritable war and you have to take a stand. To be serious is to go for the real systems. Chomsky wants the treasure and only it; the chest is rubbish and must be thrown away:

> the term 'idealization' is somewhat misleading: it is the procedure we follow in attempting to discover reality, the real principles of nature. (Chomsky 2000: 123)

Chomsky's journey towards the peak of idealized reality explains why he changed terminology, so that what he previously called grammar, or competence, now is called I-language. Through this terminological change, the central concept of linguistics, that of language, is promoted

to a more potent level of reality. As everyone familiar with his latest ideas knows, Chomsky now even tends to take the concept of language all the way to the top, to S_0, and to relegate the intellectually unsatisfactory differences between languages – those arbitrary differences that develop after birth when we grow up in various corners of the world – to the lexicon, as when he says that a rational scientist from the planet Mars 'would conclude that there is really only one human language, with some marginal differences' (1997: 121–2). Maybe she would come to this conclusion, we actually think we agree with Chomsky on this point. But the question is whether she would reach that conclusion in the abstract terms of Chomsky's (1995) *Minimalist Program*, or land more safely on human ground: our common primal language.

Performance or traditional grammar?

What is it that Chomsky leaves behind as performance when he starts the idealization process towards competence and ultimately the initial state S_0 of the language faculty? Chomsky's idealizations may not assume our most original experience of language, but they do assume basic aspects of a handed-down *perspective* on language, of an erudite culture that deals with questions of language, namely, traditional grammar as it is integrated into our educational system and learned by most citizens. Chomsky assumes our educated grammatical sensitivity to linguistic form, but as if this sensitivity corresponded to the most original perspective of the language user. The cultural dimensions of our primal language are absent, or in the background, and instead the attention is on forms of expression as classifiable objects, just as in a grammar book:

> An expression such as 'I painted my house' is accessed by performance systems that interpret it, on the receptive side, and articulate it while typically using it for one or another speech act, on the productive side. (Chomsky 2000: 125)

Performance is permeated with the same school-like outlook on linguistic phenomena that is codified in Charles Hockett's catalogue of design features. It focuses on written representations of the medium, on finely structured forms of expression, but as if this meant being as truthful as we can be to the harsh realities of everyday language use. It is as if the perspective of the grammar book came alive, stepped out of the book, and forced itself upon language more generally, so that talking

seemed like taking turns reading more or less well-composed sentences aloud to each other.

Consider how Chomsky starts the idealizing process in *Aspects of the Theory of Syntax*, how he departs from a version of traditional grammar, described as performance, in order to attain a mechanized system of syntactic rules, described as competence. Grammarians typically have strong opinions about how to speak or write well in specific languages, such as English, and they reason subtly, in many grammatical dimensions, about why certain sentences are better composed than others, and why some sentences are unacceptable. Chomsky presents human language use (performance) as if it consisted of similar assessments of linguistic form, but implicitly in how we choose what sentences to produce, in the speed with which we understand sentences, or in the ease with which we remember them. Here is how he introduces the performance-notion of acceptability:

> For the purposes of this discussion, let us use the term 'acceptable' to refer to utterances that are perfectly natural and immediately comprehensible without paper-and-pencil analysis, and in no way bizarre or outlandish. Obviously, acceptability will be a matter of degree, along various dimensions. To illustrate, the sentences of (1) are somewhat more acceptable, in the intended sense, than those of (2):
>
> (1) (i) I called up the man who wrote the book that you told me about
> (ii) quite a few of the students who you met who come from New York are friends of mine
> (iii) John, Bill, Tom, and several of their friends visited us last night
> (2) (i) I called the man who wrote the book that you told me about up
> (ii) the man who the boy who the students recognized pointed out is a friend of mine
>
> The more acceptable sentences are those that are more likely to be produced, more easily understood, less clumsy, and in some sense more natural. The unacceptable sentences one would tend to avoid and replace by more acceptable variants, wherever possible, in actual discourse. (Chomsky 1965: 10–11)

Observe how acceptability is presented as a spontaneous everyday version of traditional grammatical judgments – made 'without paper-

and-pencil analysis' – as if language users intuitively reacted to the form of sentences, just as language teachers have done for centuries, and fought hard to teach their pupils to do. Yet, acceptability is not meant by Chomsky to be a grammatical concept in his own modern sense, for he makes a fundamental distinction between acceptability and grammaticalness:

> Acceptability is a concept that belongs to the study of performance, whereas grammaticalness belongs to the study of competence. (Chomsky 1965: 11)

If we are right, then this distinction is a distinction in disguise between, on the one hand, the normative practice of traditional grammarians – who would have quite a few things to say about the five sentences, and would rank them according to their grammatical acceptability – and Chomsky's new theoretical aims in linguistics, on the other. Because traditional grammarians cultivated subtle sensibility to fine distinctions in how sentences are composed, their knowledge cannot be mechanized in a formally simple system of syntactic rules. Therefore, Chomsky downplays this sensitivity by interpreting it as an expression of humanly-limited performance systems, while the rigid mechanized system of competence grinds all five sentences in the same super-general syntactic mill:

> The sentences of (2) are low on the scale of acceptability but high on the scale of grammaticalness, in the technical sense of this term. That is, the generative rules of the language assign an interpretation to them in exactly the way in which they assign an interpretation to the somewhat more acceptable sentences of (1) . . . Note that it would be quite impossible to characterize the unacceptable sentences in grammatical terms. For example, we cannot formulate particular rules of the grammar in such a way as to exclude them. (Chomsky 1965: 11–12)

With the distinction between competence and performance, then, Chomsky sacrifices a centuries-old tradition of fine sensibility to linguistic form that arose with the invention of writing and reading. He sacrifices it because it creates problems for the modern project of formalizing grammar. For observe, once again, that Chomsky starts out from a traditional grammatical perspective on language. He thereafter

argues for the necessity of idealization by way of *modern* grammatical considerations, such as the one just recently quoted, and that belong to Chomsky's attempt in the 1960s to develop rule-based generative grammar. Performance, then, is traditional grammar in everyday-life disguise, and competence is modern mechanized grammar in natural-object disguise.

Today Chomsky sacrifices even his own invention of grammar as a mechanized system of syntactic rules. He sacrifices it for the same reason he sacrificed traditional grammar; because even these mechanized grammars turned out to differ in too many fine details to be elegantly accounted for in universal grammar. He thought that particular languages had particular grammars, but 'considerations of explanatory adequacy indicate that this cannot be correct' (Chomsky 2000: 7). In other words, the spectrum of grammars turned out to be too variegated, and it cannot easily be connected to the most potent and unitary level of linguistic reality, that of the initial state S_0 of the language faculty. Therefore, even grammars had to be sacrificed.[45]

To achieve the formal simplicity he desires in modern scientific grammar, Chomsky is prepared to sacrifice not only traditional grammar, but also his own mechanization of aspects of traditional grammar. His platonic tendency is a tendency not so much in the study of language as in the study of grammar. I-language is most strikingly characterized by his previous terminology, as grammar, and universal grammar is what its name suggests: it is universal grammar (and scarcely even that). Our conclusion is that Chomsky's technical notion of language is a *technical notion of grammar*. He has not achieved a biologically relevant notion of language. Language is virgin soil.

What do we need to do if we want to re-establish contact with our actual language? We must, as Wittgenstein saw when he diagnosed his own early idealizations of language, enhance experiential friction:

> The more narrowly we examine actual language, the sharper becomes the conflict between it and our requirement. (For the crystalline purity of logic was, of course, not a *result of investigation*: it was a requirement.) The conflict becomes intolerable; the requirement is now in danger of becoming empty. – We have got on to slippery ice where there is no friction and so in a certain sense the conditions are ideal, but also, just because of that, we are unable to walk. We want to walk: so we need *friction*. Back to the rough ground! (Wittgenstein 1953: 107)

Back to primal language! Traditional grammar, reading and writing, studying many languages, are like streams of cold water that flood primal language and hide it under a uniform surface of grammatical ice. Ape language studies melt the ice and drain the landscape. We attempt to characterize the uncovered landscape.

Chomsky's observations

When we developed the catalogue of design features of language in Chapter 2, we repeatedly drew the reader's attention to surprising parallels between some of Chomsky's more general characterizations of language and some of our design features. His vigorous argumentation against behaviourism, empiricism and traditional grammar, and for his own cognitivist approach, confronts certain common oversimplifications with observations that we find true and significant if they are understood in a cultural sense. Consider, for instance, this remark about the notion of language as a complex of dispositions to verbal behaviour:

> In fact if the 'complex of dispositions' is determined on grounds of empirical observation, then only a few conventional greetings, clichés, and so on, have much chance of being associated to the complex defining the language. (Chomsky 1969: 267)

Chomsky also observes that children's language acquisition does not resemble a typical learning process (see Chomsky 1996). There is no language teacher present when children begin to speak the first time, and they acquire language spontaneously without explicit instruction or systematic correction. What children typically hear people say are not even clearly pronounced sentences, but mumbled half sentences that from a grammatical point of view would be more misleading than instructive.

What is the function, in Chomsky's theorizing, of these and similar observations? Our answer is that Chomsky needs to emphasize the complexity of human language use and the spontaneity of human language acquisition, because in combination with his notion of poverty of (grammatical) stimulus these observations give him a reason to postulate a hidden and innate mechanism that produces the properties he has observed. Chomsky's observations are, to express it bluntly, excuses for neglecting further scrutiny of the facts. His observations – interpreted as poverty of (grammatical) stimulus – ignite his three-stage rocket to S_0. They give him freedom to create that utopia of formal

order that he desires. Let us, then, consider the notion of poverty of stimulus.

Poverty of stimulus or abundance?

It is commonly assumed that either a capacity is innate and develops according to genetic programs, or else it must be laboriously learned through explicit instruction. This dichotomy is epitomized in the opposition between cognitivism and behaviourism, and it is taken for granted in a recent attempt to promote Chomsky's idealized language faculty as a biologically relevant notion of language:

> we take as uncontroversial the existence of some biological capacity of humans that allows us (and not, for example, chimpanzees) to readily master any human language without explicit instruction. (Hauser, Chomsky and Fitch 2002: 1571)

Herb Terrace treated the same dichotomy as uncontroversial when he designed Project Nim. Since language is not innate in apes, he thought special linguistic training was needed to test if an ape can create a sentence (Terrace 1979: 85). And we took the dichotomy for granted in our early work when we, unsuccessfully, trained Kanzi's adopted mother Matata to use lexigrams. It was an unexpected discovery – one that undermined the dichotomy that shaped our practice – that Kanzi's language developed spontaneously as he matured (which is how human children acquire language). How was this possible, given that Kanzi had no language faculty? What can we learn from the discovery that apes acquire language spontaneously, if they are exposed to language the right way?

One conclusion is that language can develop spontaneously without being innate: the innate/learned dichotomy is too categorical. When the philosopher Stanley Cavell remarks, 'there is not the *clear* difference between learning and maturation that we sometimes suppose there is', he therefore does two things: he characterizes Kanzi's language acquisition, and he punctures the dichotomy that Chomsky assumes in his argumentation for an innate language faculty. Kanzi's language acquisition shatters the dichotomy that drives Chomsky's critique of behaviourism and promotion of the cognitive revolution. This neglected developmental process, related both to learning and to maturation, is what we call enculturation. The question then is: what shapes the acquisition of language through enculturation, since neither an innate language faculty nor a language teacher is around to do the job?

Special linguistic instruction did not help Nim to learn language. It rather did him a disservice. His classroom exposure to language downright inhibited his language development. Kanzi, on the other hand, acquired language. But he was not subjected to special linguistic instruction. According to the notion of poverty of stimuli, Nim's exposure to language was less impoverished than Kanzi's. But it turns out it was the other way round. Nim's exposure to language in the classroom was impoverished in what must have been the relevant dimensions, while Kanzi's exposure was not. Chomsky made some valid observations of how children acquire language, but it seems he was too quick to interpret these observations as evidence of an innate and uniquely human language faculty. A comparison between Nim and Kanzi indicates that grammatical instruction is impoverished for the purposes of stimulating language, while culture brings forth talking in a young primate. Primal culture does the job Chomsky thought an innate language faculty must do, because language exists in cultural rather than grammatical dimensions.

Why did Chomsky not see that first-language acquisition is anything but poverty of stimulus in the relevant dimensions? For the same reason that Terrace thought that Nim needed special linguistic training. As most of us are initially tempted to do, they think of language in terms of signs, words, phrases and sentences. But those terms do not indicate the vast cultural dimensions of our primal language. When Chomsky correctly observes the absence of systematic linguistic education and clearly pronounced grammatical sentences in a child's first experience of language, he conceives of this actually quite irrelevant absence as 'poverty of stimulus', because he takes for granted that language must exist in these thin erudite dimensions. He then concludes that the grammatical perspective on language from which he cannot distance himself must exist somewhere else. And the natural place for him to place grammar is inside the child's brain. But if the parallel we demonstrated in the catalogue between Kanzi's language and human language teaches us a lesson, it is that the child is immensely stimulated in other dimensions: the cultural dimensions of our primal language. There is no poverty of stimulus. Chomsky was right when he, in his review of Skinner's *Verbal Behavior*, pointed out:

> If the contribution of the organism is complex, the only hope of predicting behavior even in a gross way will be through a very indirect program of research that begins by studying the detailed character of the behavior itself and the particular capacities of the organism involved. (Chomsky 1959: 27)

Unfortunately, this is precisely the advice that Chomsky did not follow. His concept of poverty of stimulus does not take account of the creature that an infant primate is, the topology of experience that comes with having arms that can wave or be stretched out towards others, hands that can grab, gesture and investigate, a mouth that can be happy or aggressive and even bite, and eyes that can frighten, express curiosity or be frightened. This kind of animal is confused with something that engaged Chomsky more in the 1950s and 60s, given his education and place in life, namely, mathematically defined automata that initially are in state S_0 and that respond to input in formally defined ways. Automata fail to work as desired if they do not have the right internal design, and Chomsky's *Syntactic Structures* (1957) aroused attention because it seemed he could show that it was necessary to modify substantially the formal machinery to produce all and only the grammatical sentences of English.

The demonstration that it was necessary to modify finite-state grammars to capture features of English grammar is still used to promote Chomsky's notion of an innate language faculty.[46] But we are talking about living creatures, and we cannot reasonably claim that we study the biological basis of language and simultaneously disregard how evolution shaped the way we and the great apes experience the world and are sensitive to each other. Automata theory and effective decision procedures may have been hot subjects in the 1950s, but it would be a confusion of subject fields to interpret developments in these areas of human inventiveness as if they were abstract findings about the natural world.[47] From an evolutionary point of view, enculturated apes and intermediary ape/human cultures should be the most relevant models to study.

That Kanzi developed language spontaneously, as characterized in the catalogue of design features, although he is biologically less adapted to language than we are, makes it reasonable to think that his exposure to language was clear, distinct and effective in the relevant dimensions. But it also indicates that the human environment that had this effect on him was not an artefact, but shaped by the fact that we too are primates. We evidently share with the great apes the bulk of those biologically-inherited traits that come into play in language. These traits are elements of our human primal culture. We become curious, angry, happy or anguished in similar ways and turn to others according to related social and emotional patterns. The infant's language development starts in interactions that centre on these common reactions: it starts in a flexible interface of primate interactions. This constellation of primate traits can be seen as 'the contribution of the organism' to

linguistic interaction. Evolution just remodelled our human–human interface slightly and organized some of its features somewhat better for the cultural orchestration of language.

If we use Kanzi and the Pan/Homo culture as a model of human language, it becomes evident that childhood experiences that Chomsky would interpret as poverty of stimulus contain an abundance of stimuli associated with language in its cultural dimensions. When this is seen clearly, it becomes easier to understand the meaning of commonplace facts that for Chomsky are just springboards for further speculations about the language faculty. Consider how he reacts to the existence of sign languages of the deaf:

> Though highly specialized, the language faculty is not tied to specific sensory modalities, contrary to what was assumed not long ago. Thus, the sign language of the deaf is structurally much like spoken language, and the course of acquisition is very similar. (Chomsky 2000: 121)

The fact that there are languages for the deaf is for Chomsky evidence that the language faculty is even further removed from human experience than he previously thought. From our point of view, however, these languages exist because some humans use their hands in very much the same ways – in the same situations and practices – as most of us use other parts of our bodies to create spoken forms of linguistic communication. The interface of interaction is broad and flexible: it can house many media in various sensory modalities.

The scientific relevance of ordinary experience

The conclusion of our discussion of Chomsky's approach to the study of language is that philosophical and non-technical explorations of language can be relevant for biologists precisely because they are not specialized, but committed to our most primal experience of language. Science proceeds not only by way of specialization, but also by way of successful integration of specialized research work in a wider framework of human experience. Geneticists and molecular biologists act not only in the laboratory. The laboratory has wide-open channels to the hospital, and the hospital is open for patients. This friction from the domain of daily human experience shapes specialized laboratory work about 'natural objects', such as genes and protein molecules. This friction is not a hindrance, but drives and constrains successful research work, and

enables technical notions to be *about* whatever it is they are meant to be notions of. Geneticists do not have a negligent attitude towards findings in the hospital, no matter how much these findings lack the formal exactness of well-defined molecular mechanisms. Genetics is scientific specialization meticulously interlaced with a wider framework of human experience (that is to say, the doctor, nurse and patient are, in some sense, contributors to science). Without this strenuously accomplished integration, the formal exactness of genetic models would be idle: empty speculation, fascinating stories (as many economic models tend to be). So, to be able to talk scientifically about natural objects, such as genes and protein molecules, one must also be able to talk humanly about the facts of everyday life. That is why the one-sided scepticism we discussed in the previous chapter often is scientifically counterproductive. There must be carefully tried-out connections between specialization and life more generally. In all successful natural sciences, these channels are institutionalized. Individuals who fail to see this feature of scientific practice, how technical work is integrated in life more generally, tend to misunderstand the lofty ideal of scientific objectivity as if it motivated neglect of this responsibility to integrate science in life. The result is the form of scepticism we discussed in Chapter 3, where one aspect of human culture dominates the other, when, in actual fact, genuine science requires that both aspects are in harmony with each other. Genomes can be acknowledged as genomes if humans can be acknowledged as humans.

The status of our notion of primal language

In comparison to Michael Tomasello's models of cognitive mechanisms by which chimpanzees and children are hypothesized to learn new skills, our notions of primal language and enculturation might appear hopelessly vague. Tomasello formulated some detailed cognitive learning recipes; but, to the reader, we may appear to assume that the cake will magically bake itself. The concepts of primal language and enculturation are not meant as abstract models, however, in the sense that Chomsky defined a model of the language faculty and Tomasello several models of learning mechanisms. Our concepts unite already known facts in a manner that helps us to better understand what previously puzzled us. They demonstrate that the abstract model of language that Hauser, Chomsky and Fitch (2002) offered the biologists was premature. Philosophical scrutiny of already known facts removes the 'big problem' they invoked to motivate the model: the model is motivated by a

pseudo-problem. The concepts of primal language and enculturation prepare a position from which to ask better motivated, but perhaps also more modest, scientific questions about the not yet known biology of language; for instance, about our neural control of the speech apparatus.

These philosophical concepts provide a framework for understanding more specialized language studies. An example would be Jared Taglialatela's acoustic research on the bonobos' vocal speech (Taglialatela, Savage-Rumbaugh and Baker 2003). He knows that the bonobos' vocal speech is not the essence of their language, but a medium that functions linguistically in accordance with the apes' own discovery that they can use their high-pitched voices to talk with fellow-creatures in the already language-enriched Pan/Homo culture. It is important that Jared is familiar with Kanzi and the other bonobos, that he knows their personalities, voices and daily habits, and that the vocalizations he studies are not recorded in isolation from clear and distinct situations in the culture, but in peaks of interaction where the connections between what goes on and what is said are more obvious. What are documented are not merely the vocalizations, but their interplay with other aspects of the situation, such as gestures, gazes and Pan/Homo activities coordinated in language. These peaks need not occur naturally, but can be created in working sessions with the bonobos in the laboratory. Jared Taglialatela and Lauren Baker now plan a computer task that can indicate how easily the bonobos identify their own vocalizations. The ape's task is to match vocalizations with sample vocalizations. That we do not isolate language as a demarcated entity does not exclude the possibility that vital aspects of language can be demarcated and studied in the laboratory.

The concepts of primal language and enculturation reorganize how we find it natural to query the unknown biology of language. They motivate interdisciplinary approaches, since language no longer is fenced off as vocabulary and grammar. The philosophical concepts do not belong to any specific science, but unite interdisciplinary work by providing a common understanding of specialized research tasks. What we would be interested to know more about is not a demarcated language faculty, but the wide variety of primate traits that evidently come into play in language use. Furthermore, since enculturation took Kanzi on such an unexpected journey in the human direction, since his genotype evidently allowed a greater phenotypic plasticity than previously was thought possible, an important great-ape trait to further explore is plasticity. We guess that the paradigm in communication

studies that Shanker and King (2002) clarify might be a part of these future endeavours.

We emphasize, however, that it is by philosophizing that this study is scientifically relevant. Scientists in various fields who study language are best helped today, we believe, by fair descriptions of our most primordial familiarity with language, so that future questions can be more firmly anchored in experience, and technical notions can be notions *of language*. In the field of ape language research, reality responded dramatically to our ideas about the nature of language, and corrected us as it never corrected us before. But its verdict was that our ideas were so fundamentally confused that we had to philosophize before we had the right to return to science.

It is by resisting the temptation to create premature abstract models that our inquiries in this book are meant to be scientifically relevant. Our task is to prepare the future by not running ahead of it, but stubbornly remaining where we are, clearing up the difficult-to-survey ground. Otherwise, we would only create make-believe science: precisely defined models in a void of confusion. The concepts of primal language and enculturation are philosophical attempts to bring into immediate focus the vast cultural framework of language, so that researchers in various fields may approach language in a more specialized spirit while acknowledging the broader framework. Let us now examine the nature/nurture dichotomy while navigating in this elucidated landscape of the primal language.

Do children steal language from adults?

According to innatist thinking, the infant enters the world with general knowledge of the most essential features of all human languages. The infant is not an empty container for languages as cultural artefacts, but rather pregnant with language as a natural possession. According to Tomasello's culturalist thinking, on the other hand, the child is linguistically vacuous and has to learn languages as arbitrary social conventions that exist outside of her. She may at most be born with a biologically-inherited ability to see others as intentional agents. It is the elders who are in possession of the language. To acquire human language, the child has to learn it from the adults by imitating them. Here is a striking expression of such a view:

> When they (my elders) named some object, and accordingly moved towards something, I saw this and I grasped that the thing was called

> by the sound they uttered when they meant to point it out. Their intention was shewn by their bodily movements, as it were the natural language of all peoples: the expression of the face, the play of the eyes, the movement of other parts of the body, and the tone of voice which expresses our state of mind in seeking, having, rejecting, or avoiding something. Thus, as I heard words repeatedly used in their proper places in various sentences, I gradually learnt to understand what objects they signified; and after I had trained my mouth to form these signs, I used them to express my own desires. (Augustine, *Confessions*, as quoted and translated in Wittgenstein 1953: 1)

This image opens up Ludwig Wittgenstein's *Philosophical Investigations*. Wittgenstein used the passage from Augustine to illustrate what he thought was a seductive picture of the essence of language: individual words name objects, and sentences are combinations of such names. But Augustine's words express a powerful image also of what it means to *learn* language. The elders possess the language while the child is without property, but because he can understand the adults as intentional agents, he can imitate them and soon start using words for the same purposes they do. The language is thereby transferred from the elders to the child.

Stanley Cavell has said that Augustine's image gives him the impression that the child *steals* the language from the adults:

> what strikes me about Augustine's description is how isolated the child appears, training its mouth to form signs (something you might expect of a figure in a Beckett play), the unobserved observer of the culture. The scene portrays language as an inheritance but also as one that has, as it were, to be stolen. (Cavell 1990: 99)

If the child steals language from his elders, then imitation would presumably be the theft mechanism. One must admit, however, that the child that occurs in Augustine's image is remarkably mature. Does he lack language? He seems to live in a perfectly meaningful world where he can find his way about and understand what others are doing, although he never speaks or interacts with them. Augustine's image has the same ambiguity that characterized our formal tests with Kanzi. For Augustine's image is not only an image of a linguistically vacuous child who is forced to steal language from his parents. Augustine's image actually takes language for granted as a self-evident feature of human life,

although it can be difficult to notice this. But Wittgenstein recognized the imprint of language on Augustine's child:

> Someone coming into a strange country will sometimes learn the language of the inhabitants from ostensive definitions that they give him; and he will often have to *guess* the meaning of these definitions; and will guess sometimes right, sometimes wrong.
>
> And now, I think, we can say: Augustine describes the learning of human language as if the child came into a strange country and did not understand the language of the country; that is, as if it already had a language, only not this one. Or again: as if the child could already *think*, only not yet speak. And 'think' would here mean something like 'talk to oneself'. (Wittgenstein 1953: 32)

What at first appears to be a pre-linguistic ability to understand the elders as intentional agents turns out to be – when we listen carefully to the child's reasoning – humanity's primal language, although the medium of speech is erased. The child that Augustine describes as learning language already is enculturated, and he talks! He talks to himself in an attempt to learn what appears to be a foreign language: a second language. He is assumed to train his mouth to form signs, just as you might train your mouth to pronounce words in a foreign language (or as Nim was trained to form signs with his hands, in spite of the fact that he lacked language altogether).

We have here, then, two opposed but very seductive images of what it means to acquire language: the innatist image and Tomasello's culturalist image. In the first image, the infant is pregnant with language. In the second image, she is infertile and steals language from the adults. Both images are, in our view, exaggerations prompted by misidentifying primal language as a mere second language. This confusion underlies Chomsky's poverty of stimulus argument for the view that language *must* be innate. The same misidentification prompts Michael Tomasello to think that language *must* be acquired via a powerful cultural learning mechanism of imitation: via a theft mechanism with a ratchet effect that protects the stolen goods.[48]

The reason Tomasello adduces for the claim that language must be learned by imitation is that 'there is virtually no way to discover arbitrary social conventions on one's own' (Boesch and Tomasello 1998: 601). Presumably, he means that since a convention is arbitrary, one needs to have access to the intentions with which the arbitrary signs are used by others in order to learn the convention. So, what does imitation look like in young children who acquire their first language?

Tomasello's experimental work punctures a simpler variant of the culturalist image of word learning (Tomasello and Barton 1994, Tomasello, Strosberg and Akhtar 1996). According to the simpler variant, children learn new words by having them ostensively defined by pedagogic adults, who point and say the words:

> Almost all of the experimental research on children's early lexical development has employed ostensive naming contexts. These are contexts in which an adult's primary intention is to point out and name an entity for a child, and the designated entity is perceptually present at the time the word is said. The problem is that mini language lessons of this sort are not representative of the contexts in which most children learn most of their words. (Tomasello, Strosberg and Akhtar 1996: 157–8)

The image that Tomasello rejects here is, one might say, not one where children steal language from adults, but one where adults bequeath it to new generations in repeated acts of ostension. Adults are kind enough to *give* children the words of their language. Learning the language means being explicitly taught new words by generously pointing and showing adults, according to this simple image. We want to remind the reader, however, that this was how Tomasello assumed that enculturated apes acquire the ability to learn language. He suggested that they always have someone who 'points for them, shows them things, teaches them, or in general expresses intentions toward their attention' (Tomasello 1999: 35). He treats human and nonhuman primates asymmetrically, just as Terrace did when he thought that chimpanzees can learn language only via explicit training. Normally, the reasoning is that since apes do not have an innate language faculty, the question is whether they can learn language by being specially trained. Tomasello rather seems to reason like this: since apes do not have a biologically-inherited cultural learning mechanism, the question is whether they can learn language via extremely explicit ostension procedures.

Here is another illustration of how tempting it can be to think that pointing is simple and explicit, and therefore required when the learner is an ape or a very young child. Tomasello and Barton (1994) demonstrated that two-year-old children easily learn new words in non-ostensive contexts. Tomasello, Strosberg and Akhtar later studied whether younger children can learn their very first words the same way, or if they need ostensive definitions by pointing adults. Their conclusion was that also eighteen-month-old children learn words in non-

ostensive contexts, 'even though they were just beginning to acquire words' (Tomasello, Stroberg and Akhtar 1996: 174). The expectation, evidently, was that very young children might require ostensive definition procedures to learn their first words, because they are so young. It turned out they acquired words the same way older children do. But the expectation that they might need ostensive definitions is, in our view, as misguided as the expectation that apes need such definitions. Ostensive definitions are not as simple as they appear on the surface, and they would be of no service to the very young language learner (be it a human child or a young ape). Pointing, then, does not constitute a short cut to culture and language.

Is pointing out a key for an infant the same ostensive definition as pointing it out for a foreigner who does not know the English word 'key'? One would rather want to say that while the gesture teaches the foreigner all she needs to know about the word 'key', the young child has only *begun* to learn the word. The gesture belongs to an extended process of cultural initiation, and that enculturation process can run its course even without pointing. Recall Kanzi's gesture when he said KEY: he brought together his thumb and index finger as if he held a key in his hand. His gesture reflects that he acquired the word 'key' by being allowed to unlock doors with keys, and not because someone pointed to a key, or a photo of a key, and said 'key'. If an ostensive definition explains all there is to know about a word, then the learner already is enculturated and she speaks. The relevant question is how *old* children must be to learn words via ostensive definition procedures.

Although Augustine briefly mentions pointing, and Wittgenstein used the passage from Augustine to illustrate the idea that we learn words via ostensive procedures, pointing and teaching are not emphasized by Augustine. The image he creates is that of a child who passively observes the elders, a child who understands their intentions and who thereby learns to use words the same way they do. The elders live behind a pane of glass, as it were, in parallel with the attentive but solitary child, and they do not act pedagogically towards the child (it is noteworthy that many psychological experiments involve barriers). This invisible barrier slowly disintegrates as the child trains his mouth to form signs and imitates the elders' word usages, as if he had not been able to express his desires until he got possession of the elders' words. Tomasello's experimental demonstration that children learn words in non-ostensive contexts calls to mind this image of an apparently lonely child who steals language from the adults by understanding their intentions. Augustine's

image accentuates the *persuasive simplicity* of Tomasello's theory that we learn language by imitating others.

In the experiments, described below on the basis of Tomasello's (2001: 141) own summary, a child watches an adult who talks, smiles and frowns while she manipulates objects or searches for them. The test words are invented nouns such as 'toma' and 'gazzer', and invented verbs such as 'daxing'. The question is if the child can learn the words without having them ostensively defined. Therefore, the referents are not perceptually available when the words are said:

1. In one test the adult announces her intention to 'find the toma.' She then looks for it in a row of buckets containing novel objects. She may find it in the first bucket, and smilingly give it to the child. But she may also have to search longer, reject unwanted objects by scowling at them, until finally she finds the wanted object, smiles and stops searching. The child learns what the toma is independently of how many objects are rejected.
2. In another test the adult searches for four different objects in four different hiding places. The child has seen the objects and knows where they are hidden, but she does not know their names. The adult announces her intention to 'find the gazzer'. She then approaches one of the hiding places, a toy barn, but it turns out to be 'locked'. She frowns at the barn, and then proceeds to another hiding place, 'let's see what we can find'. She takes out an object and smiles. The child learns what the gazzer is even though she did not see it after she heard the name, and even though the adult frowned at the barn and smiled at a distractor object.
3. In a third test, the adult announces her intention to 'dax Mickey Mouse'. The adult then performs two actions after each other: one accidentally, one intentionally. The child learns that daxing is the intentional action, regardless of which action is performed first.

These tests are illuminating and important. They demonstrate that a child *can* learn new words by, in some sense, understanding others' intentions. It is unclear, however, whether these tests provide a truthful image of what it means to acquire language more generally. For what capacity does the child *already* have when she understands the adult sufficiently well to learn new words as she learns them in the tests? Consider Tomasello's answer:

> The adult in the above scenarios is not just moving and picking up objects randomly; he or she is searching for an object, and the child must know this to make enough sense of the adult's behavior to connect the new word to the adult's intended referent. The main theoretical point is that an organism can engage in cultural learning of this type only when it understands others as intentional agents like the self. (Tomasello 2001: 141)

Tomasello's 'theoretical point' is that the child in these tests can learn new words because, being a human child, she can 'understand others as intentional agents'. But what does this general capacity amount to? Would Tomasello claim that the child has a pre-linguistic ability to understand that others can 'search for an object in a series of buckets, and not necessarily find it in the first one'? Would he claim that the child has a biologically-inherited ability to understand that 'a container can be locked, and this can frustrate attempts to take objects out of the container'? Would he claim that the child has a very general ability to see that '*that* action is accidental, but *those* are clearly intentional'? We doubt that Tomasello would make these claims. The child must somehow have acquired these particular abilities to understand the adult.

When Tomasello describes the child's 'intention-watching' he emphasizes general sociopragmatic cues such as scowling, frowning and smiling. This is not coincidental, since it is important for him to keep the intention-watching clean of cultural content: the watching is, after all, assumed to be the *general mechanism* through which particular cultural skills are transmitted. Augustine places a similar emphasis on the elders' bodily movements: 'the expression of the face, the play of the eyes, the movement of other parts of the body, and the tone of voice which expresses our state of mind in seeking, having, rejecting, or avoiding something'. Augustine keeps the child's intention-watching clean of word-language, since he assumes that it must be the mechanism through which the child learns what objects the elders' words signify. But smiles and other moves of the body are not obvious! If an adult says that she intends to 'find the toma', and smiles while she takes an object out of a bucket, that smile can be as inscrutable as Mona Lisa's. If the child does not already understand what the adult says and knows what it means to search for objects, she will probably not take the smile as recognition of a sought-after object. So, to understand the adult's frowns and smiles, the child must already understand what the adult is doing, and Tomasello seems to agree. But how did the child acquire that ability?

How does a child learn that 'a container can be locked, and this frustrates attempts to take things out of it'? By seeing others try to open one and becoming angry? Well, that is how we mature adults may come to understand that some particular container is locked. It is hardly how an immature child comes to understand such things the first time. On the other hand, it cannot be irrelevant that people do try to open containers and become angry when they fail to do so. The child matures in such a world.

Finding a container locked and becoming angry belongs to activities where we search for objects: behind doors, in pockets, in drawers, in photo albums, in computer files, on other planets or in toy barns. How does a child learn to search for things? Is it by imitating adults who perform 'searching'? How hollow it sounds! Certainly, one wants to say, searching for things must have a basis in the child's own life. Sooner or later, the child quite simply looks for things of her own accord: not *any* things, but *certain* things that non-arbitrarily and yet not inevitably enter her life. Before the child can walk and talk she looks for mother when mother walks out the door; she cries when big brother takes her biscuit and she stretches out towards it in the thief's hand. One day this child creeps on tiptoe to the larder in search for biscuits and she will be frustrated when she finds that she cannot open the biscuit-tin. How did she learn to do this? She may have seen her brother do it. But did she learn from her brother to become frustrated when she fails, too? And why did she not imitate this action many months ago, when she could imitate other actions, such as hitting the drum with the drumstick so as to create lots of exciting noise?

It seems that the child's ability to understand what the adult is doing in Tomasello's tests cannot be characterized as a *general* capacity to 'understand others as intentional agents'. The child's ability to understand the situation and learn from it slowly emerged, and new words appeared within that vaster transformation of the child's life *at home* (rather than in the laboratory). It was in the course of this maturational process – difficult to capture in separate laboratory sessions[49] – that she learned to 'look for biscuits', and similar relevant forms of language. It follows that the ability she already has when she is tested – for example, the ability to look for toys in containers together with a talking adult – is precisely the kind of ability that Tomasello would desire that his general learning mechanism could explain.

If it were claimed that the child obviously must have a general capacity to understand others as intentional agents, since she understands the adult's *particular* intentions in the test, then that claim would be a

pun without explanatory power. It would be like saying: 'since I can play the harmonica, I have the general ability to play some musical instrument; if I did not have the general ability, I could not even play the harmonica; consequently, my general ability belongs to the explanation of why I can play this particular instrument'. Tomasello's theory has, it seems to us, this problematic form. He interprets a verbal generalization as if it signified a causal mechanism. (This applies also to his new idea about a uniquely human ability to share intentions. Why can humans build houses together? Is it essentially because we have the general ability to do things together?) His basic idea is that the general ability functions as a cultural transmission mechanism through which the child learns particular new skills, such as the use of 'gazzer'. But the child's ability to understand the test situation and thereby learn what 'gazzer' means is scarcely a general ability but a number of interlaced abilities that gradually emerged in her life with others, and Tomasello has no explanation of the fact. The general mechanical explanation is vacuous.

A weakness in Tomasello's notion that language is learned imitatively, then, is that we imitate only what we already basically understand. How do we learn fundamentally *new* aspects of language and life? There is no room for confusion or lack of understanding in Tomasello's model, but surely, enduring confusion and lack of understanding belongs to the learning process. Children have recurrent periods of anxiety, irritability and nightmares, but also of joy, excitement and cockiness. Human life is not simply a set of 'cultural techniques' that we learn by calmly imitating our neighbour. Acquiring language is to a great extent a frighteningly and excitingly *creative and transforming process*. Language emerges in children as if they were pregnant with new forms of life. New ways of being are born almost daily. Children respond, gesture, act and speak as they did not respond, gesture, act and speak just a month ago. Only occasionally does the child steal skills from the adults by imitating them. But to reach the point where a skill or two can be imitated, the child has already undergone a metamorphosis and developed abilities she did not even know she lacked: abilities that were alien to her previous forms of existence. This uncertainty and excitement of giving birth to new forms of language and life with others is not reflected in Tomasello's model.

Returning to Tomasello's tests, we find that they have the same ambiguity as our own tests with Kanzi had. Just as we tested Kanzi's comprehension of 'vocabulary' and 'novel sentences', so Tomasello tests the child's ability to learn new words by way of 'imitative learning'. But his

tests are just as deeply embedded in ongoing primal language activities as our tests were. The adult says that she wants to 'find the toma', and starts looking. The child immediately responds appropriately! Do not forget that comprehension precedes production: eighteen-month-old children already have a primal language and respond with understanding to the adult's words, even though they scarcely speak at all. This primary comprehension is largely what Tomasello interprets more schematically as 'understanding others as intentional agents'. The embedding primal language activities emerged in the child's life before she was tested, but normally not via the same calm imitation process that is tested. They emerged in more uncontrolled ways, while the child still did not understand and imitate the adult. There is no general mechanical explanation of the fact that a child wakes up one morning and talks and acts in ways she could not adopt before. Somehow, new abilities came alive in her. Her discovery of these abilities in her, and her understanding of them in adults, came simultaneously. The ability to imitate new forms of behaviour, then, is very much the *result* of having developed such forms of behaviour without imitation.

Observe that although 'toma', 'gazzer', and 'daxing' are novel words their *forms of use* are not novel. These test words function basically as 'biscuit', 'doll' and 'combing' already function in the child's life. Therefore, the child *can* learn these words via imitation. But what if the adult said, 'let's find out what *time* it is', and then started looking at various objects, frowning and rejecting them as if they were 'bad' in mysterious ways, and then, finally, while looking at a watch, said with a smile, 'oh, its twelve-thirty and time for lunch'? Would the child then learn what the words 'time' and 'twelve-thirty' mean as they are used in connection with clocks and those 'points of time' that such devices determine in our adult world? Well, the child has probably heard adults say such things before. So far, however, she has not been able to learn the significance of these words by way of some general ability to see others as intentional agents (although she may understand aspects of what is said). And it will take a number of years before she looks at a watch herself and says, 'oh, I must hurry home'. If the adult in the test introduced the theme of time (as clocks determine it), then she might create anxiety in the child, because her actions would be recognizable as elements of the *adults' unknown life*. Or maybe the child becomes excited and wants a watch herself, and for the same reason.

Our conclusion is that although imitation occurs when children develop their primal language – as Tomasello's illuminating experiments demonstrate – his culturalist theory that *this* is how we learn language

is misconceived. If some creature learned language by imitating us, then we would wonder if that ghostlike creature actually spoke and truly had language. Language would seem to have no basis in such a creature: it would be a linguistic vampire. To paraphrase Rush Rhees: if any animals do learn to speak, they will not learn it just as they learn to imitate tricks.

Culture makes us pregnant with language

Suggestive images, metaphors and analogies influence even apparently sober thinking. Just consider the concept of a 'transmission mechanism'. It is often valuable to indulge in images for a while, and to discuss them *as* images, so that we do not become their victims. We have nothing to gain by pretending they do not exist. Let us therefore, very consciously, develop an alternative image of what it means to develop new forms of life, such as language.

How do we learn to understand movies? Movies contain many non-arbitrary and yet not fated ways of depicting past and simultaneous events, dreams, memories, murders, thoughts, plans, conversations and so on. These modes of depiction are not innate. Yet, we do not learn them by understanding others as intentional agents, for the cinema is dark: there is no one to imitate. And even if the cinema were lit, we would still not turn towards others to 'see how it is done'. So, how do we learn to understand movies? Talking with others helps, of course, but there must be something to talk about. There must be experiences that we have not been persuaded to have just because others were such eloquent social constructors. A child goes to the cinema at a certain age, and when the circumstances are right she understands many features of movies that no one had taught her. The child makes her own discoveries. We do not explain everything for a child who just recently saw her first movie, and the explanations she requires are successful only if *she* finds that they shed light on what *she* saw. She must to a great extent be able to proceed of her own accord in the circumstances of culture. This ability to 'go on' in a certain manner of our own accord is a central theme in Wittgenstein's (1953) discussions of what it means to learn to follow a rule. Teaching presupposes primitive reactions in pupils. To a great extent, then, we discover understanding as emerging unforeseen responses in us to culture – when the circumstances are right. 'So much of the infant's development seems to be spontaneous, even self-governed', Shanker (1994: 79) remarks. Understanding may require verbal explanations or hints from others' conduct, but those hints do

not dictate understanding, as if we were vacuous and had to steal our human lives from an external culture. Rather, new forms of life are born in us in the right circumstances of culture: this is the design feature of spontaneity.

Culture, it would seem, then, fertilizes us and makes us pregnant with new forms of life, such as watching movies. Everyone experiences this. When the circumstances are right, we discover that we understand what we did not understand a month ago. In a sense, we create the wheel afresh, over and over again, although the circumstances of culture powerfully support these discoveries of unforeseen possibilities in us. And it is not irrelevant that the people with whom we talk, the persons whose conduct it helps to watch, those with whom we live, are very much like us to begin with. They are the same sort of primates and they matured in the same primal culture. Their explanations, when we ask for guidance, have the same basis in their lives as our assessments of their explanations have in our lives. Social constructors, to the extent that they exist, are not free to construe the world arbitrarily. There really are 'arbiters of truth', namely, in those forms of experience that we find we can have, in the ways we quite simply notice we respond and proceed in culture. We repeat that teaching presupposes primitive reactions in the pupil, and that the learner is not a *tabula rasa*: this is the design feature of the flexible interface of primate interactions.

Let us return to the powerful images that tend to govern our thinking about how a child acquires her first language. In neither the innatist nor Tomasello's culturalist image is language created anew in the child. Language already exists: either internally in the mind/brain, or externally in the culture. A language acquisition device, or a cultural transmission mechanism, simply transports language from its mental or cultural residence to the child and makes it available to her. The child has no vital role to play in the drama. She is just the happy beneficiary: the one to whom language is handed over through the workings of a hypothesized mechanism.

How does our image depict a young child who develops her primal language? The young child is not vacuous, but has a life with others from the start: an interface of primate interactions that slowly changes its shape. Language emerges (rather than is 'transferred') as an aspect of this dynamic life with others. 'The child does not learn the meanings of words directly, by simply being an observer in the teaching situation. Rather, learning takes place gradually, the child himself participating actively in the process' (Hertzberg 1994: 77). In new circumstances, new language abilities appear in the active child's life with others. This often

puzzles us, for we never instructed the child: we evidently assume that the child cannot learn what we have not taught her. All we can do in response to this puzzlement is to state what ought to be obvious, namely, that young children begin to act similarly in similar circumstances of culture: circumstances already shaped by the fact that we are human primates. We discover the same possibilities in our lives as our predecessors explored. Tomasello's ratchet effect is therefore not as important as he assumes it is. Culture does not have to be secured mechanically, via imitation (although imitation occurs), for culture is not the artefact he takes for granted that it is. The pupil is not vacuous, but responds in characteristic ways to our kind of culture. An important reason why primal culture is so stable over the generations, then, is that we make the same discoveries in us. Since our reactions to the circumstances of culture are similar, we give birth to similar forms of life. If we were not as similar as we are, as biological creatures, imitation would not have the power to counteract the differences. Our similarity as human primates is a component of our culture as talking humans. And we evidently have tighter connections to the other primates than has been taken for granted.

If many cultural anthropologists traditionally underestimated this profound 'biology-like' generality of human culture, it is perhaps because anthropology lacks a clear concept of primal culture corresponding to the notion of primal language. Or perhaps we should say that what is needed is a distinction between primal and secondary *aspects* of human culture, to avoid the impression that we are dealing with two 'specific cultures'. The phenomenon of culture is not exhausted by the totality of specific cultures, just as the phenomenon of language is not exhausted by the totality of specific languages. Language and culture, as we elucidate them, exist at deeper levels. We also want to emphasize that were we to talk about the biological nature of man, we would not enumerate basic *needs* such as metabolism, reproduction, safety or health (see Malinowski 1944: 91), but rather the abundant potentials for action and interaction that are inherent in our bodies (the flexible interface). Human life is not merely an attempt to invent artefacts to satisfy basic biological needs and derived cultural needs. Life is *occasionally* about needs and their satisfaction, but the idea that human life *must* be analyzed in those terms is an imposed intellectual demand.

Instead of seeing culture as an artefact, we prefer to say that our biology is plastic and updateable: culture is our updated biology. The cultural possibilities in our lives are to a great extent unforeseeable. They

are happy coincidences that we explore together with others, as dancers explore the unknown possibilities in their bodies by finding new forms of interplay with others and with the environment. It turns out there can be such things as movies and words in our updated lives as primates. The bonobos, for instance, love to watch movies and they often request videos that we produce where one of the caregivers is dressed up as a gorilla. They are worried when the gorilla appears and ecstatic when put to flight!

Language, we want to say, then, is a non-arbitrary but not fated possibility in human and nonhuman primates, just as watching movies is. Our predecessors explored this possibility, and we re-explore it in childhood, by growing up in circumstances that are shaped by the previous explorations (a similar theme is elaborated in great detail in Greenspan and Shanker 2004). Because language is not an artefact, but an aspect of our updated biology, we have no reason to reject the possibility that language is further shaped by genetic evolution (children's babbling might be an example of one of our genetic adaptations to a linguistic cultural environment).[50] Mainly, however, language is an aspect of our culturally upgraded biology. Our cultural environments challenge our genes during ontogeny and make them involved in language development. We know that we, in making this remark, are speculating about the genetics of language. But in speculating along these lines we also demonstrate a way of formulating questions about the biology of language that can become fruitful because it is firmly anchored in present experience.

So, how did the intermediary Pan/Homo culture make Kanzi speak? Not by waking up a slumbering language faculty in apes that so far has not given rise to languages in the apes' natural habitats. Neither by making Kanzi see us as intentional agents and encouraging him to imitate us (although imitation belonged to the process). No, when we spoke to Kanzi as we speak to children – taking for granted he would understand – he turned out to be almost as open to our primal culture as a child, and he gave birth to this unforeseen possibility in him.

The creative and the critical aspect of the methodology

Sue Savage-Rumbaugh's discovery in the early 1980s that Kanzi developed language spontaneously undermines apparently self-evident notions of language. In writing this book, we admit that it was logical that her work did not immediately have the impact it deserved on sciences such as linguistics, psychology and biology. It was logical, because

her discovery was so difficult to understand, and so contrary to powerful tendencies in the age in which we live. The isolated fact of Kanzi's language was feeble – even when presented with detailed statistics – unless its general relevance could be clarified and opposing tendencies tackled. It is not to be expected that scientific disciplines will rethink their basic notions on the basis of a superficially understood discovery in a domain that for most people quite simply is peripheral. Whether we like it or not, the burden of proof – or philosophical clarification – is ours.

One could give a simple common-sense description of Savage-Rumbaugh's discovery. It concludes the investigation above and it says: if we talk with apes as we talk with children – taking for granted that understanding will appear – then the apes will begin to understand us and even speak to us. If we over-interpret them when they are young and immature, they will soon make that interpretation true. Sue Savage-Rumbaugh is sometimes accused of over-interpreting her results. The truth is that over-interpretation is an important means towards *achieving* the results, just as it is with human children. There are people who immediately accept this straightforward description. But too quick acceptance can be unfortunate, since the significance of Savage-Rumbaugh's work lies in the dramatic way it gives us a reason to tackle prejudices that we might not otherwise scrutinize. What many take to be a peripheral finding touches the nerve centre of contemporary culture, for instance, our obedient subordination as modern humans to the professional, official and impersonal sphere of super-organized society. To set free the critical potential in the fact that Kanzi acquired language spontaneously when we talked with him as familiarly as we talk with our children, the common-sense description must not occur until the end of a lengthy and unyieldingly reasoned philosophical inquiry. The straightforward common-sense description can only state that we have returned home from an expedition into the false imagery of contemporary culture: the image of the abstract scientific model, the image of culture as artefact, the image of imitation as a general cognitive capacity, the image of animal behaviour as entirely natural, the image of language as vocabulary and grammar.

It may be useful to introduce a distinction, namely, between a creative and a critical aspect of Savage-Rumbaugh's scientific methodology. The creative aspect of the methodology is the part of her work where results are *achieved* (and here over-interpretation has been a vital element). The critical aspect of the methodology is the part of her work where results are *tested* and alternative interpretations assessed (and here

the aim is precisely to avoid over-interpretation). Much of the critique of Savage-Rumbaugh's work results from a failure to see the distinction between these two aspects of her work. In this book we have discussed the hitherto not clearly understood creative aspect of the methodology: the way the results with Kanzi were achieved. We believe that critics have not seen the scientific significance of a creative methodology: they seem to assume that science is exhausted by its critical aspect. Physics, however, has developed creative methodologies for centuries: it has known how to *achieve* results, and not just test them afterwards. If psychology still is a 'young' science, it is perhaps because it has not yet discovered the significance of creative methodologies whereby psychological reality is changed and results are achieved. Such methodologies must, we believe, be sensitive to culture and to processes of enculturation.

It is vital that our notions in this book are meant to make us more sensitive to the life we already live as humans. Otherwise, they would only mystify, as if they hypothesized obscure and unknown processes. Our image of enculturation – 'culture makes us pregnant with language' – is not a vague and speculative alternative to formally more precise innatist and culturalist models. It is an alternative to being too quick to define abstract models about phenomena that we have not first tried to characterize faithfully. And when experience is described more faithfully, the motives for the suggested models often evaporate. There is no poverty of stimulus: the 'language faculty' is unmotivated. The forms of life that emerge in childhood are not artefacts: the 'transmission mechanism' is unmotivated.

How can language be studied in better ways, so that fictitious motives no longer motivate fictitious models? We do not pretend that we have a blueprint of what future generations of researchers should explore. Another hypothetical model guiding the research would not bring about the deeper moral-and-cultural change that the clarification of Kanzi's language motivates: a harmonization of science with life. What is first of all needed in our present situation is not a new hypothesis about the unknown essence of language, but a heightened awareness of what is already known every day of our lives. The unknown needs a basis in the known. Such awareness makes it easier to ask more precise and experience-based questions about what is truly unknown, and not just postulated to explain postulated problems. We mentioned a few examples of good research tasks: detecting traits that we share with other primates and that interlace in early language development; studying plasticity culturally as well as neurologically and genetically; pin-

pointing unique human adaptations to language; developing new ways of documenting animal vocalizations and gestures that can bring out their significance in the animals' own cultures; studying how the cultural environment challenges primate genomes during ontogeny and make them involved in speech and language; exploring our neural control of the speech apparatus. These tasks are fascinating and important, but their successful accomplishment requires that we never lose sight of the following: the fact that Kanzi has language means that *he* would speak and listen to *you*. The simplicity of the fact is its significance.

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Summary: The Catalogue of Design Features

> *'We shall at least be freed from the vain search for the undiscovered and undiscoverable essence of the term species.'*
>
> Charles Darwin

Comparative studies of cognition in human and nonhuman primates should in the future be complemented by cultural approaches where humans and animals are allowed to affect each other. Such work would help us see the overwhelming affinities and similarities that put the differences in their proper perspective:

> Biology that lacks an intuitive knowledge of resemblances can provide only an impoverished, mechanistic view of the living world. We may say that the rationalization of this intuitive understanding of similarity is the essence of the new science of living things. (Imanishi 2002: 7)

It is doubtful whether experimentalists can reasonably continue to compare cognition in humans and apes as before, now that we know the cognitive effects of the Pan/Homo culture on individuals belonging to two interacting species. We learned by Charles Darwin, more than a century ago, that species are not categorically distinct but belong to the same family tree. Now we learn that they are susceptible to each other's presence and develop unforeseeable cognitive and other skills together, if they start to interact at an early age. Our most basic attitude towards animals tends to be that they are inflexible and their behaviour natural, instinctive and automatic in a sense that excludes culture. Our experiences have changed this attitude towards animals. We see all encounters with young and still immature apes as *possible beginnings*. Apes recognize

this attitude and respond to it. How animals live and act should therefore to a greater extent than before be understood as a function of the cultural environment in which the animals under study mature and find their ways of living. Previous studies of alleged 'natural' cognitive capacities in nonhuman primates must be reassessed culturally.

We do not reject the concept of species, but the ideal of studying animal life as if species were planetary systems with properties that only can be studied at a discreet distance has made many researchers unreasonably unaware of the affinities that allow individuals of the same or different species to interact and shape their forms of life. Hunters learn from their prey, and a farmer who is not affected by their cattle, or a shepherd who does not create their own imprint on the flock, would be a bad farmer or shepherd. Antelopes are not alien creatures for other animals living in the same area: they respond to each other; there are flexible interfaces of interaction here too. Why should not biologists and psychologists, occasionally, use this mutual sensitivity between species respectfully as a resource to new kinds of discoveries, instead of throwing it in the dustbin as 'lack of objectivity'? Or is it perhaps important to avoid too close relations with laboratory animals, especially when they are young and quick to learn, since it would make it difficult to measure their 'species–specific' capacities? Field-working ethologists carefully avoid interaction because they do not want to change the animals under study: they want to uncover their 'natural' behaviour. But if human presence so easily affects animals, both in the laboratory and in the wild, does it not follow that we need a more dynamic understanding of animal behaviour than the notion of 'natural' and 'species–specific' behaviour? We transform our children profoundly when they are immature and quick to learn. Does it not follow that we *should* attempt to transform laboratory apes just as profoundly, if we want to make scientifically valid comparisons between them and us?

Japanese primatologists recognized our affinities with the other animals. They saw it as well-grounded scientific practice to provision the animals, to name individual animals and to interpret their behaviour in analogy to us, and this led Japanese primatology to groundbreaking discoveries that still transform Western ethology. Jun'ichiro Itani, for instance, describes how actions by one individual animal may change the entire social structure of a group and thereby give the animal society a history analogous to that of human societies. 'We have until now treated primate societies as entirely natural phenomena, but we now see that within some primate societies the members are themselves altering its shape' (Itani 1985: 607). Many field-working Western ethologists carry out similar long-term studies of animal societies. They study

the actions of individual animals and the effects these actions have on the society. When *The Origin of Species* punctured the myth that the species were created once and for all, independently of each other, as if differences between species were abysmal and eternal, Darwin also punctured the notion of a categorical divide between humans and other animals. Evolution produces differences, but they are ramifying *variations* of common themes. Although Western biology accepted this in theory, many of its practices remained unaffected until Japanese primatology taught us the *moral* lesson that we are animals not only in an abstract classificatory sense, but also in an intimate first-person perspective: *we* are animals. Frans de Waal was right when he defended anthropomorphism on evolutionary grounds. In being followers of Kinji Imanishi and Jun'ichiro Itani, we are also followers of Charles Darwin. We provisioned Kanzi, Panbanisha, Nyota and Nathan not only with food, but also with words and language and with our personalities, as parents do with their children. We expected, on evolutionary grounds, that they would respond similarly, and they did. This symmetric upbringing makes comparisons between humans and apes more rational than they have been in the past, and more revealing of the biological basis for language. Our voyage in the plastic archipelago of primate culture reaffirms, in the first-person perspective, Darwin's notion of species, and indicates an unexpected concordance between Japanese and Western biology.

Below we summarize the design features of language. The catalogue is the result of a culturally fair comparison between species. It reveals unforeseen linguistic potentials in apes and neglected cultural dimensions of language in humans.

Design features of primal language in Pan and Homo

1. Spontaneity

Innatists have a point when they deny that language is learned and instead prefer to say that language grows in the child. Yet, Kanzi proves that language is not innate in the sense of the hypothesis of the uniquely human 'language faculty'. Language was a novel reaction in Kanzi to the new (for bonobos) cultural environment in which he matured. It was when we stopped encouraging the bonobos to imitate us, and instead responded and spoke respectfully to *them*, that they developed the ability to speak to *us*. The Pan/Homo culture is not only human, then, but an intermediary culture that transformed members of both species simultaneously: apes and humans became bicultural Pan/Homo beings. Language emerged in Kanzi to the extent that all of

us, apes as well as humans, were affected together and developed a shared ape/human culture. The dichotomy involved in thinking that language either develops according to innate genetic programs, or else must be transmitted to the individual from an external and artificial culture through training or imitation, neglects how language is created anew in spontaneous interactions with children and young apes.

2. Boundlessness

Acquiring words is inseparable from acquiring the forms of life in which the words have their uses. There are no demarcation lines between the emergence of the primal language and the development of a young primate's life more generally. We learn what the words 'another place' mean by, among many other things, travelling to other places, returning home from them, and planning to visit them again. We acquire the seemingly simple phrase, 'let's go to . . .', by participating in activities where we make decisions about our mobile lives. The dimensions of the primal language are thus cultural and mundane rather than grammatical and delimited to what can be written down as well-formed sentences. The languages that we can study in the classroom presuppose primal language skills that emerge in the mere living of life. A student who already speaks can practice French 'from ten to twelve', but a child who is beginning to speak for the first time acquires words while she is preoccupied with doing other things. Primal language is an intrinsic aspect of every move we make in our cultural environments.

3. Immanence

Test activities are mediated by the primal language. We talk with the apes before, during and after the tests, just as we talk with children when we take them to the doctor. Instead of frustrating the demands of scientific objectivity, immanence makes our studies more objective, informative and rational than many previous studies of primate cognition. Given the far-reaching effects of culture on cognition, it is not sound scientific practice to compare cognitive capacities in apes and human children if only the latter test subjects are enculturated in language. Culture, and thereby primal language, is not a biologically inert ornament on our animal nature. It is, moreover, easier to interpret results of tests that are mediated by language, since we can judge if the apes understand the test sufficiently well to either fail or succeed in it. Ape responses to people who suddenly appear with buckets on their heads are notoriously difficult to interpret. We achieve a clear and fair understanding of the cognitive capacities of great apes by studying their devel-

opment in an intermediary culture that supports an infinitely variable spectrum of linguistic interactions between apes and experimenters.

4. Cultural creativity and generality

When a word generalizes to a novel situation, the new situation and its unforeseen relationship to more common situations in the culture are utilized according to our own ability to improvise together in mundane environments. Two persons may easily understand each other when they say, 'those tunnel workers are opening the mountain', because what the workers do strikes them as similar to the opening of a door. The novel combination of words is not produced by unknown syntactic mechanisms, but by our more primal cultural ingenuity. The verbal regularities that can be found in language are not inconsequential, but they cooperate with aspects of the culture: that is how they exist and function in language. When Kanzi pointed PEAR and thereby asked 'can Pär go to the trailer and get the surprise?' he utilized the entire Pan/Homo situation that emerged that day, and he used the coincidence that the word 'pear' sounds like the name Pär. This primal-language creativity is rendered invisible when projected onto a sheet of paper in the form of the typographic item 'pear'. The vast cultural dimensions of the primal language make our finite verbal means infinitely expressive.

5. Placement

Charles Hockett's tenth design feature, displacement, is an effect of an opposite feature of the primal language, namely, placement. Linguistic communications are often about things remote in space and time. The reason they *can* be 'displaced,' however, is that they are placed in cultural activities that emerge with the primal language. Kanzi's ability to talk about locations far away in the forest, for instance, draws on the simple fact that we regularly travel to these places while talking with him. Every parent knows how difficult the concepts of 'yesterday' and 'tomorrow' are for a preschool child. These concepts develop in the child when she is initiated into, and begins to take responsibility for, organizing activities according to our characteristic diurnal and nocturnal habits. A culturally informed perspective on cognition, then, reveals that our ability to plan the future and talk about what is not in our perceptual field resides in cultural activities.

6. Gestures and tools

Gestures are visible indications of the cultural dimensions of our primal language. Just remember the gesture of looking at the watch when we

think it is time to leave (we need not read it, we might not even wear one). Or remember Kanzi's gesture when he asked for the key: he gestured as if he held a key between his thumb and index finger. Since tools are vital elements of culture, language bears witness to our tool uses. When one watches Kanzi while he manufactures stone tools, one can see that he is a skilled craftsman. But one can also see that he is linguistically versatile and that one can discuss details in his work with him. One knows that one can walk next to him when he looks for new material, and discuss the value of the stones he picks up. His enculturated body is *visibly* the body of a speaking creature. The distinction between verbal and non-verbal behaviour is questionable, and there is good reason to see the entire body, as it is used in a variety of activities, as the 'organ of speech.'

7. Culture-sustained vocal speech and other media

Bonobo speech is instructive precisely because it is so difficult to understand for non-members of the Pan/Homo culture. While we were still influenced by a grammatical conception of language, we thought the reason we heard spoken words in the bonobos' vocalizations was that we heard abstract analogies to spoken English. We hired a blind research student, because we assumed she had a more advanced ability to hear these analogies. But in contrast to the caregivers who interacted daily with the apes, she could not detect a single word in the recorded vocalizations that she studied. The bonobos developed a *new* vocal medium on the basis of their anatomical potentials for communicating linguistically with their voices in Pan/Homo situations. The possibility of words in the bonobos' vocalizations is not merely an acoustic possibility; rather, it presupposes the language-enriched environment in which their vocalizations can be found to have significance as words. So, the reason we understand the bonobos is not that we detect acoustic parallels to spoken English. It is rather because we understand what the bonobos say to us that we can trace analogies to spoken English. The bonobos understand their speech easier than do any of us humans, but our difficulties to understand communications in their medium indicate that even human speech is culture-sustained. The facility with which we normally understand human speech makes it easy to neglect the role played by culture when we understand what we say to each other.

8. Cultural unity

Individuals who speak different languages have difficulties understanding each other. This fact easily fools us into thinking that the unity of

specific languages – their vocabulary and grammar – is the most basic unity of language. There is another and more primal unity of language, however, one that cannot be represented in writing, and that we normally fail to notice when we study communication problems among adults who already speak. It concerns the forms of life that humans develop more or less unanimously in childhood when they begin to speak the first time, although they come to speak different languages. What is required to bridge the communicational gap between a human who already speaks and an infant who does not yet speak at all is not merely a specific language, such as ASL or English, but an entire culture that can house language (a gradual development of the *entire* interface of interaction). Cultures housing aspects of human language are not out of reach for great apes, if we respect their differences and let them develop these cultures as it turns out natural for them (that is, new intermediary cultures must be allowed to develop). We do not doubt the utility of a grammatical perspective on language. For the purposes of understanding the most primal nature of language, however, such a perspective presupposes too much of what it means to be able to speak, and we must broaden our outlook on linguistic phenomena and see the cultural unity of language.

9. Non-arbitrariness

We reinterpret Hockett's eighth design feature, arbitrariness, as a consequence of a more primordial non-arbitrariness of the primal language. When the perspective on language is broadened so that we can survey its basic cultural unity, we attain a new understanding of the arbitrariness of the linguistic sign. The lexigrams that the bonobos use are indeed arbitrary. We could easily have designed the lexigrams differently, or used some other medium (for example, ASL). But it is unclear what it would mean to cultivate *uses* of signs in the same arbitrary spirit. Zamenhof could design Esperanto arbitrarily, and he could have made it differ more from already known languages. But it does not make sense to try to design, arbitrarily at the drawing-board, the *forms of life* that can house the signs of a language. To the extent that linguistics emphasizes the arbitrariness of the linguistic sign, it defines as its objects of study phenomena distinct from the primal language. That limitation is, of course, perfectly all right, as long as we understand that it is a limitation.

10. Reflexivity

Reflexivity, communications in language about language, is the only one of Hockett's design features that we retain (although in his cata-

logue, what he calls 'reflexiveness' is listed as design feature 15). Since the bonobos are not language-trained, pointing to lexigrams is creative and does not have static significance. But it is difficult to express new ideas clearly by pointing to lexigrams. The almost constantly improvising bonobos therefore have to check that their human addressees have perceived their utterances, and the humans must display their understanding to the bonobos so that the apes can accept or reject it, normally vocally and by means of gestures. Talk with the bonobos almost always turns into negotiations about what was said. The bonobos, moreover, reliably answer questions of the form 'what is this called?' and 'do you want to say something to Clara?', and they respond appropriately to requests such as 'write it on the floor' and 'say it with your voice'. The bonobos invent new names for visitors in manners that display awareness of a variety of aspects of language, and they occasionally even try to teach other apes the meaning of words. Reflexive uses of language emerge spontaneously in bonobos, just as they do in human children.

11. Flexible interface of primate interactions

The flexible interface of primate interactions is our attempt to identify, rather than postulate, the contribution of the organism to language. We emphasize the linguistic relevance of the topology of experience that comes with being born with a primate body; the linguistic relevance of the forms of interaction that come with having arms that can wave or be stretched out towards others, hands that can grab, gesture and investigate, a mouth that can be happy or aggressive and even bite, and eyes that can frighten, express curiosity or be frightened. We share with the great apes the bulk of these traits that come into play in language development. We become curious, angry, happy or anguished in similar ways, and turn to others according to related social and emotional patterns. Language is born right here: the interface is plastic and soon incorporates words, and these words function linguistically only as integral parts of the entire interface of interaction.

12. Moral and personal dimension

It is impossible to stimulate language in apes without talking with them as familiarly as we talk with our children and close acquaintances, for that is quite simply how we enact language: by facing each other and talking. When young Kanzi pointed to lexigrams and looked at Sue with an expression that showed that he meant something, he made her recognize her personal and moral relation to him as the obvious, but easily neglected, dimension of life in which his language could be cultivated.

By opening our eyes to the limits of the distanced and purely professional identification of animals, Kanzi helps us touch our own nature as animals. The first-person perspective need not be alien to biology. On the contrary, it can stimulate radically new kinds of discoveries and put genuine science on the track, as we believe our work on ape language demonstrates. Understanding is transformation, and whether we like it or not we are constantly transforming each other, creating new intermediary cultures. 'To live is to act and to create. In that sense all the daily life of living things is part of evolution' (Imanishi 2002: 68).

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Appendix 1: The Apes[51]

Apes on the Homo-side of the Pan/Homo continuum

Name: Kanzi (Swahili for 'treasure')
Born: 1980
Sex: Male

Kanzi came to the LRC in Atlanta when he was six months old. He is the star of the research, and is regarded as the first ape with real comprehension of spoken English. Kanzi's comprehension of speech is demonstrated in carefully controlled tests (see Savage-Rumbaugh et al. 1993). He hears spoken words through headphones and is asked to indicate the object, the photo or the lexigram that the word represents. His comprehension of spoken language is at least equivalent to that of a two-and-a-half-year-old child. Kanzi also manufactures and uses stone tools, and he enjoys playing musical instruments, such as the xylophone.

Name: Panbanisha (Swahili for 'cleave together for the purpose of contrast')
Born: 1985
Sex: Female

Panbanisha was, until the age of four, co-reared with the chimpanzee Panzee. Like Kanzi, Panbanisha acquired language without specific training. Her language skills are the most advanced of all the bonobos. She began using the keyboard earlier than Kanzi, and Savage-Rumbaugh judges that she has progressed further (although this has not been tested formally). Panbanisha is currently participating in studies of linguistic communications, dialogue analysis and vocal communications.

Name: Nyota ('star')
Mother: Panbanisha
Born: 1998
Sex: Male

Nyota was born at the LRC in Atlanta. A staff member from the Congo selected his name. Panbanisha approved his name by vocalizing loudly when she heard the staff member speaking it aloud. Nyota is instrumental to current research on the cross-generational effects of language

and culture in a second-generation of bonobos reared in a bicultural environment. Nyota is housed with his mother, Panbanisha, and his little brother, Nathan.

Name: Nathan
Mother: Panbanisha
Born: 2000
Sex: Male

Nathan is the youngest of the bonobos. His mother, Panbanisha, behaves more like a human mother than other bonobo mothers. Whereas other mothers tend to care for their children on their own, Panbanisha has been asking staff members for help in taking care of Nathan since the time of his birth.

Apes on the Pan-side of the Pan/Homo continuum

Name: Matata
Born: In the Congo
Sex: Female

Matata is the matriarch and dominant member of the bonobo group. She was brought to the Yerkes Research Center in 1975 as part of an effort, funded by the National Academy of Sciences, to establish a bonobo research station in the Congo. At puberty, Matata was placed in a social group of bonobos at the Yerkes field station. One year later, in 1980, she adopted Kanzi from his natural mother and raised him as her own son. Matata and Kanzi came to the LRC in 1980. Over five years of effort have been invested to teach Matata lexigrams. This effort has only resulted in partial competence with six food names.

Name: P-Suke (pronounced 'peace-kay')
Born: 1979
Sex: Male

P-Suke was the only bonobo living in Japan before he became a part of the social group at the LRC. P-Suke is the father of Elikya, Nathan, Nyota and Maisha. P-Suke is a peaceful bonobo and very amiable.

Name: Elikya ('hope')
Mother: Matata
Born: 1997
Sex: Female

Elikya is used as a control subject when we compare the competencies of apes raised in a language-rich environment to those who are not. She spends much time with Nyota, though, who is a year younger.

Name: Maisha
Mother: Matata
Born: 2000
Sex: Male

Matata delivered Maisha with no assistance. She cares for him much as she has cared for her previous seven children, and much like bonobos in the wild: mostly on her own.

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Appendix 2: The Keyboard[52]

List of lexigrams occurring on the keyboard

The lexigrams on the keyboard are abstract symbols. Some keyboards are electronic and sound the English words that correspond to the lexigrams, but the most commonly used keyboards are printed versions coated with plastic. English translations of the lexigrams are printed below each lexigram, and here we list these translations for the reader. The number of lexigrams increased over the years: new symbols were added as new aspects of Pan/Homo life emerged. Below, the reader can study the present set of lexigrams. Kanzi and Panbanisha understand all the lexigrams and react appropriately when humans use them. Although they use a majority of the lexigrams when they talk with humans, they do not use all of them. It is important to create possibilities for the apes to express themselves on the keyboard when the need arises, for they repeatedly develop language that we have not actively tried to teach them. Kanzi understands at least 1,000 words and uses about 250 of the lexigrams below. The translations give the reader a notion of daily Pan/Homo life, or life on the human side of the Pan/Homo continuum.

English translations of lexigrams on the keyboard:

Nathan	Maisha	Orange
Spot	Tickle	Melon
Ball	Childside	Go
Sue	Tomato	Cherries
Colony Room	Food	Group Room
Pee	Apple	Bedroom
Liz	Dog	Juice
Chase	Staff Office	Sleep
Talk	Keyboard	
Mary	Trailer	Peanut
Coffee	? [Question-mark]	Jelly
Clara	Banana	A-Frame
Orange	Key	Open
Peaches	Light	Play Yard

Orange Juice
Collar
Celery

Coke
Blanket
Airport

Bite
Cheese
Stethoscope

1 (One)
Car
Sue's Office
Outdoors
Yes
Orang-utan
Bread
Hose
Hurt

2 (Two)
Raisin
Groom
Bill
Milk
No
Hug
Get
Look

3 (Three)
Hamburger
Log Cabin
Fire
Hotdog
Can-opener
Water
Jump
Tree House

4 (Four)
Sherman
Chow
TV
Burrito
Pine-needle
Straw
Turtle
Come

5 (Five)
Egg
Stick
Rock
Crisscross
Ice
Hide
Goodbye
Midway

Dig
Sour Cream
Sue's Gate
Blackberries
Rubber Band
Shot
Hello
Magnet

Kanzi
Rain
Carrot
Butter
Lookout
String
Lemon
Scrubby Pine Nook

Austin
Clover
Mushroom Trail
Velvet Plant
Green Bean
Pinecone
Gully Gusher
NASA Building

Fridge
Lever
M&M
Money
Camper Cabin
Gone
Bark
Hilltop

Music
Sandpile
Lemonade
Umbrella
Flatrock
Matata
Grab
Surprise
Pear

Taco
Later
Soap
Paper
Sponge
Spoon
Knife
Lettuce

Peas
Hammer
Onion
Give
Oil
Play
Snake
Think

Good
Bad
Nails
Tamuli
Bubbles
T-Room
Nest
Quiet

Shoe
Camera
Tool Room
Potato
Phone
Cabinet
On
House

Duane
Fight
Slap
Kiwi
River
Swimming Pool
Blueberry
Head

Mirror
Cold
Yesterday
Grapes
Backpack
Balloon
Fast
Bottom

Coconut
Pomegranate
Mushroom
Pinky
Noise
Please
Book
Slow

Keep Away
[Unclear meaning][53]
Lighter
Paint
Sparkler
Vacuum
Toothpaste
Pineapple

Clay
TV-Tape
Elikya
In
Push
Tomorrow
Bug
Scare

Now
Trash
Salt
Pillow
Jello
Panbanisha
Mouth
Foot

Bowl
Sugar
Perrier Water
Privet
Kool-Aid
Draw
Gorilla
Easy

Towel
Downstairs
Strawberries
Yogurt
Popsicle
Thank You
Sugar Cane
Big

Happy
Jared
Cereal
Monster
Hat
Toothbrush
Shirt
Plastic Bag

Noodles
Mad
Away
Leaf Tree
Out
Wash
Off
Hand

Dessert
Hot
Observation Room
Chicken
Lana
Middle Test Room
Toy
Tummy

Shop
Bunny
Honeysuckle
Panzee
Wipies
Carry
Vitamin
Throw

I
Mine
P-Suke
What?
Right
Elykia
We
Want

Brush
Clippers
Like
Kiss
Be
Night
Before
Cooler

Ear
Medicine
Pretend
Little
Touch
Listen
Back
Piece

Swelling
Different
More
Is
Point
Candy
Wait
To

New
Picture
Nyota
Agree
Show
Wrong
Red
Had

-Ing
Stop
Say
There
Walk
Today
These
Have

Said
Bathroom
Ready
Time
Crayon
Pour
Me
Count

Can
A [Indefinite article]
Close
Down
Electric Shock
Visitors
Marshmallow
Fruit

For
Will
Tea
Same
Some
Box
Drink
Try

All
Puzzle
The
Sit
Squirrel
Then
Yellow
Blue

Fish
Mask
Joystick
Make
This
Where
Bird
My

-Ed [Past]
Until
Chalk
Vegetable
Feel
Not
Blackboard
Yours

Broken
See
Take
It
Put
Watermelon
Eat
Up

Sick
Work
Need
Careful
Are
Was
If
Arm

Secret
Do
That
And
Thing
Plural
Place
Green

Break
Here
Run
Sorry
How
Many
Colour
You

Notes

1. See de Waal (2001) for an initiated description of how the theme of culture in animals originated in Japanese primatology and now permeates de Waal's and many other ethologists' studies.
2. The psychologists Keith and Katherine Hayes tried to teach the chimpanzee Vicki human speech, or at least to pronounce the four words 'mama', 'papa', 'up' and 'cup' (Hayes and Hayes 1951).
3. David Premack's approach with the chimpanzee Sarah, and Duane Rumbaugh's with the chimpanzee Lana. Premack used an invented artificial language of plastic chips that Sarah had to combine in certain ways in order to get a reward (Premack 1971). Rumbaugh's artificial language was similar to Premack's, but the symbols were available on a computer keyboard (Rumbaugh 1977, Rumbaugh and Washburn 2003).
4. Essentially Herb Terrace's (1979: 18–22) critique of Sarah's and Lana's combinations of symbols into sentence-like structures: 'The closer I looked, the more I regarded many reported instances of language as elaborate tricks for obtaining rewards' (Terrace 1979: 18). The same critique is delivered against the chimpanzee Washoe's alleged linguistic productions. Washoe was raised by Allen and Beatrice Gardner, and was taught to use American Sign Language. Washoe learned to use 132 signs, but she was assumed by the Gardners to understand three times as many signs (see Gardner and Gardner 1969).
5. Herb Terrace and his colleagues spent four years teaching American Sign Language to a chimpanzee named Nim Chimpsky. During these years of daily interaction with Nim, Terrace was optimistic, and many everyday activities were coordinated in sign language. However, when it was time to watch the video tapes critically and report the results from the project, he made the unexpected discovery that Nim was more or less mirroring the teacher's signs, and that his combinations of signs therefore could not be understood as creative language use resulting from the application of grammatical rules. Many interpreted this discovery as a triumph of objective science over ape language researchers' alleged tendency to anthropomorphize their animals. We will later discuss if Nim perhaps did acquire some very rudimentary linguistic skills, and if Terrace's negative reporting at least partly was the result of inappropriate techniques for assessing Project Nim.
6. 'In general, the rearing environment was designed to promote communication about topics of interest to apes. This environment was intentionally designed as an informal, relaxed setting in which apes could be given the opportunity to hear and see people talk about things that were of particular interest to them. Such opportunities were not experimentally structured but rather occurred spontaneously within the daily events of traveling in the forest in search of food' (Savage-Rumbaugh et al. 1993: 40).
7. 'The fact that comprehension did *not* require reinforcement supports the view that comprehension is the driving force underlying all language acquisition' (Savage-Rumbaugh et al. 1993: 19).

8. 'None of the animals who began language training after 2½ years of age acquired symbols without extensive and explicit training. More important, none of the 'late exposure' animals developed auditory comprehension of more than a few spoken words even by 9 years of age, while all the 'early exposure' animals comprehended 40 or more spoken words by 2½ years of age' (Savage-Rumbaugh et al. 1993: 42–3).
9. See, Kawamura (1959); Kawai (1965); Bonner (1980); Boesch and Boesch (1983); Boesch (1991); King (1994); Guinet and Bouvier (1995); de Waal (1996); Huffman (1997); Hirata, Myowa and Matsuzawa (1998); Whiten et al. (1999).
10. The fact that apes spontaneously develop humanlike communicative behaviour when they are reared in a humanlike (but bicultural, Pan/Homo) environment makes it reasonable to see linguistic interaction as a cultural development of forms of interaction that can be found in both human and nonhuman primate infants. See Chapter 2: 83–7.
11. For further discussion, see Chapter 2: 70–2.
12. Formal laboratory tests, such as those we carried out with Kanzi, are not simply objective tests of linguistic and cognitive skills, for they are deeply shaped by our schooling as members of a literate culture. Conducting such tests on apes, children or members of illiterate cultures, or even on literate adults, is not a straightforward task, but requires cultural self-awareness. For a revealing discussion of this fact, see Don S. Levi's (1996) article, 'Why do Illiterates do so badly in Logic?'
13. See Segerdahl (1996) for a discussion of the extent to which grammar-based attempts in pragmatics to explain phenomena of language use are contingent upon the very forms of use that one attempts to explain.
14. For more details, see Savage-Rumbaugh et al. (1993: 24–33).
15. The parallel between ape language research and the debate over the possibility of artificial intelligence is noted by Wallman (1992: 149) and discussed by Shanker (1994).
16. Even though we do not see conversation analysis as a literally true description of the human first language, we think that this form of research emphasizes important aspects of language that have been neglected in linguistics. Concerning the question of how we 'repair' failures to express what we want to say in natural interaction, we find Schegloff, Jefferson and Sacks (1977) illuminating.
17. The bonobos listen to music every night and enjoy the sound of musical instruments. Kanzi plays the drums and the xylophone, and Panbanisha the synthesizer and the harmonica (see *Kanzi II*). It might not satisfy a music teacher, but they enjoy it just as children enjoy creating sounds with musical instruments. Panbanisha especially adjusts her way of playing to how her human companions play. Kanzi, however, just tries to create as much sound as he possibly can! There has not been much work done on bonobo musicality, but Patricia Gray, artistic director and president of National Musical Arts, is planning a research project on the bonobos' perception and performance of music.
18. Rhees (1970: 63).
19. We do not claim, of course, that philosophy is unique in this respect. Perhaps the anthropologist Gregory Bateson can be read to express the design feature

of boundlessness when he remarks: 'Without context, words and actions have no meaning at all' (Bateson 1979: 15).

20. See Gustafsson (2002) for a discussion of Travis' notion of occasion-sensitivity.
21. 'Our clear and simple language-games are not preparatory studies for a future regularization of language – as it were first approximations, ignoring friction and air-resistance. The language-games are rather set up as *objects of comparison* which are meant to throw light on the facts of language by way not only of similarities, but also of dissimilarities' (Wittgenstein 1953: 130).
22. The difficulty of understanding this aspect of Wittgenstein's language-games can be seen in his own pupils' discussion of the builders' language-game (see Rhees 1970 and Malcolm 1989). This language-game is described in paragraph 2 of *Philosophical Investigations* (Wittgenstein 1953).
23. Savage-Rumbaugh has, in another context (1999: 118), remarked that the demand to prove, in controlled test situations, that the apes have language, has forced her to 'underreport' the things she observes the apes to do. This book is an attempt to direct the reader towards the apes' more comprehensive primal language: the foundation of the abilities that have been reported in detail, and thereby the foundation of the formal test activities.
24. Descartes, 'A Discourse on Method,' Part 5.
25. 'Generative grammar seeks to discover the mechanisms that are used, thus contributing to the study of *how* they are used in the creative fashion of normal life. How they are used is the problem that intrigued the Cartesians, and it remains as mysterious to us as it was to them, even though far more is understood today about the mechanisms that are involved' (Chomsky 2000: 17).
26. See also Segerdahl (1994, 1996).
27. See Segerdahl (1996: 18–24) for an attempt to describe the cultural dimensions in which children acquire the use of clocks and time-expressions.
28. See Pinker (1994: 372–3), where he comments on a written transcription of Nim's productions. It is characteristic of Pinker's grammatical approach to language that when he compares Nim's utterances with those of a child, he chooses to compare them with sentence-like utterances such as 'We going turn light on so you can't see' (as if children spoke in sentences), and not with transcriptions of real-life *interactions* that actually are full of repetitions. Faithful transcriptions of naturally occurring human conversations are often shockingly illegible (see Schegloff, Jefferson and Sacks 1977).
29. Research on Kanzi's ability to produce and use stone tools is led by the archaeologist and anthropologist Nicholas P. Toth. See Toth, Schick, Savage-Rumbaugh, Sevcik and Rumbaugh (1993), and Toth, Schick and Semaw (2003).
30. See Stoutland (1988).
31. There is now a scientific journal specifically devoted to gestures: *Gesture*, edited by Adam Kendon and Cornelia Mueller and published by John Benjamins.
32. 'Yerkish' has been used as a name for the system of lexigrams that Duane Rumbaugh developed at the Yerkes Primate Center for use by the chimpanzee Lana. This system has been developed over the years and is now found on Kanzi's portable keyboard.

33. Tamuli was sickly and died some years ago.
34. For detailed investigations into the rhetorical, conceptual and personal aspects of the battles between ape language researchers and sceptics, see Taylor (1994), Shanker (1994), Savage-Rumbaugh, Shanker and Taylor (1998), and Savage-Rumbaugh (1999).
35. Friedrich Nietzsche (1966: 186) claimed that the only way to begin comprehending human morality was by comparing *many* moralities. Evolutionary thinking requires a readiness to make even broader comparisons, namely, between the ways of life of *many species*.
36. For a detailed study of how bonobos at Wamba in the Congo negotiate encounters between members of different unit-groups, see Idani (1990).
37. See also Imanishi's (2002) notion of *recognition*.
38. Imanishi (2002: 1–8) expresses similar ideas about similarity and difference, and he too uses the image of the family (or of parents and their children) to express his view.
39. This conversation about Kanzi's ball occurred in August 2002, and was overheard by Pär Segerdahl. The conversation began with Kanzi pointing to the keyboard outside of the enclosure. The caregiver asks, 'Do you want to say something?' Kanzi indicates the keyboard again with a gesture. The caregiver presses the keyboard against the wire and Kanzi points to the BALL lexigram.
40. For further discussion, see Segerdahl (1998, 2003).
41. There is a parallel between between Socrates and Edmund Husserl (1970b), where Husserl's European culture corresponds to the Athenian culture that Socrates apparently felt was in a crisis.
42. For further discussion of Chomsky's notion of language in *Syntactic Structures*, see Segerdahl (1995).
43. The dialectic between theoretical and experimental work in the early development of quantum physics is exposed in detail in d'Abro (1951).
44. This is precisely how Joel Wallman describes communicating apes: 'Clearly, in *any* species, the language faculty must be supplemented by a certain level of functioning in other mental domains for manifestation of normal language. What appears to be the case is that the ape is competent in some or all of the collateral areas but devoid of a language faculty' (Wallman 1992: 112).
45. 'This "Principles and Parameters" approach, as it has been called, rejected the concept of rule and grammatical construction entirely' (Chomsky 2000: 8).
46. See Hauser, Chomsky and Fitch 2002: 1577.
47. For a discussion of how Chomsky's notion of language is shaped by trends in American academic life during the 1950s and 60s, see Stenlund (1997) and Shanker (2002).
48. Tomasello, Kruger and Ratner (1993) argued that since we humans understand others as intentional agents, we reproduce *strategies* used to achieve goals. Innovations are thereby faithfully imitated: seeing others as intentional agents works as a *ratchet* on innovations, making cultural evolution possible.
49. For a discussion of the difficulty of studying cultural cognition in the laboratory, see Donald (2001).
50. Tomasello, on the other hand, speculates that after humans acquired the ability to understand others as intentional agents, language evolved purely culturally, 'without any additional genetic events' (Tomasello 2001: 143).

51. See also the GATI web site: www.iowagreatapes.org.
52. See also the GATI web site.
53. The meaning of this lexigram is unclear. It has no English translation, but it is used for the 'come and go person.' At least six people have had this lexigram. We still have to investigate what the apes think about this lexigram.

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