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Language and Thinking: Principles of Famous Linguists

10

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Contents

Abstract

People have speculated that language arose through emotively expressive cries, by virtue of human rationality, and from our need to interact socially and maintain advantageous social relations with our fellows. But whichever of these speculations is correct, they all required the biological development for the production of language in speech and its management in the brain. Humboldt seems to have conceived the idea that the interdependence of language and thought was affected by the cultural environment of language speakers (itself responsive to the physical environment), such that different languages reflect the different world-views of their language communities. Humboldt is arguably the originator of the so-called "Sapir-Whorf," "Whorfian," or "linguistic relativity" hypothesis: "Die Sprache ist das bildende Organ des Gedanken" (Humboldt 1836: LXVI). Humboldt judged that because language and thought are intimately connected, the grammatical differences between languages are manifestations of different ways of thinking and perceiving. The structure of language affects perceptual processes and also the thought processes of speakers. Language mediates world-view such

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that different world-views correlate with different language structures that no sole individual can change; consequently, languages are stable organic wholes. This view passed via Steinthal to Whitney for whom "the 'inner form' of language" causes "the mind which was capable of doing otherwise has been led to view things in this particular way, to group them in a certain manner, to contemplate them consciously in these and those relations" (Whitney 1875: 21f) – and thereafter to Boas (1911), Sapir (1929), and Whorf (1956). Whereas there is evidence that one's language necessarily influences the way entities in the (physical and metaphysical) world are spoken of, and this must reflect cognitive processes, it would seem that these different ways of thinking in different language communities have little effect except on the language used. In the words of Slobin (1996: 91), it "affects the ways in which we think while we are speaking" but is by no means a mental strait-jacket: the human mind can and does go anywhere.

Thinking and the Origins of Language

Language and thinking are obviously related: although solipsistic thought may not involve language, to express that thought to others does. And it is widely believed, probably accurately, that expressing one's thoughts to another person helps clarify the thinking. This linking of language and thought may well motivate notions about the origins of language. It is probable that human beings have speculated on the origin of language since prehistoric times. In our literate culture, in *Cratylus* (c. 385 BCE), Plato's Socrates attributes the creation of language to a wordsmith, *nomothetēs*, or name-maker, *onomatourgos*, on the basis of sound symbolism; but he concludes by throwing doubt upon the plausibility of such a hypothesis (cf. 426b, 434e–435c). Epicurus (341–270 BCE) rejected the idea of the name-maker, suggesting instead that humans at first uttered cries as other animals do in reaction to their experiences of the world; later, social pressures coerced humans to communicate purposefully with each other by distinguishing referents using conventional symbols, but they also had recourse to analogy and onomatopoeia. This enabled them to speak of absent entities.

> Hence even the names of things were not originally due to convention, but in the several tribes under the impulse of special feelings and special presentations of sense, primitive man uttered special cries. The air thus emitted was moulded by their individual feelings or sense-presentations, and differently according to the difference of the regions which the tribes inhabited. Subsequently whole tribes adopted their own special names, in order that their communications might be less ambiguous to each other and more briefly expressed. And as for things not visible, so far as those who were conscious of them tried to introduce any such notion, they put in circulation certain names for them, either sounds which they were instinctively compelled to utter or which they selected by reason or analogy according to the most general cause there can be for expressing oneself in such a way. (Epicurus 1926: iii.1488)

Similar ideas were expressed by Lucretius (*c.* 95–55 BCE) in Book V of his *De Rerum Natura*, "On the nature of the universe" (Lucretius 1951: 202–4). It is natural for humans to vocalize in order to achieve their goal:

> As for the sounds of spoken language, it was nature that drove men to utter these, and practical convenience that gave a form to the names of objects. We see a similar process at work when babies are led by their speechless plight to employ gestures, such as pointing with a finger at objects in view. For every creature has a sense of purpose for which he can use his own powers [Lucretius gives several examples]. (Lucretius 1951: 202)

Lucretius convincingly scorns the notion of a name-maker:

> To suppose that someone on some particular occasion allotted names to objects, and that by this means men learned their first words, is stark madness. Why should we suppose that one man had this power of indicating everything by vocal utterances and emitting the various sounds of speech when others could not do it? Besides, if others had not used such utterances among themselves, from what source was the mental image of its use implanted in him? Whence did this one man derive the power in the first instance of seeing in his mind what he wanted to do? One man could not subdue a greater number and induce them by force to learn his names for things. (Lucretius 1951: 203)

He goes on to point out that it is not at all surprising that humans differentiate things using different "vocal utterances," because even "dumb cattle and wild beasts" do that (See toward the end of this section for modern evidence that this is true.):

> If the animals, dumb though they be, are impelled by different feelings to utter different cries, how much the more reason to suppose that men in those days had the power of distinguishing between one thing and another by distinctive utterances! (Lucretius 1951: 204)

Like Epicurus, Lucretius believed that humans are naturally predisposed to use language; but unlike Epicurus, he explicitly denies that language was invented by a single person. Neither philosopher had much time for gods. Lucretius explains the conventions of language usage within society as a variant on animal communication; but, unlike Epicurus, he says nothing about the symbolic character of word forms – not that Epicurus offers a convincing explanation for how this could have come about.

From about this time on, Latin scholars preferred to summarize all knowledge rather than specialize in particular disciplines. There was little attempt to match reported statements with observations of reality: what was significant was the perceived authority of the source and not the pragmatic validation of its assertions. Once the Christian Church dominated scholarship in Europe, scholars preferred the authority of the Bible or a Church father. St Isidore of Seville (560–636) asserts that "Hebrew is the mother of all languages and alphabets" (*Etymologiae* I.iii.4), sourcing this from St Jerome (Epistolae XXIX; XXX in Jerome 1864: 441ff):

> The diversity of languages arose after the flood, at the building of the tower [of Babel, Genesis 11: 4–9]; for before that [. . .] there was one tongue for all peoples [Genesis 11: 1], which is called Hebrew. (Isidore 1850: IX.i.1)

Adam, of course, spoke Hebrew (*Etymologiae* XII.i.2). But it seems that God speaks to a person in their own language, whatever it may be (*Etymologiae* IX.i.11):

> There are three sacred languages, Hebrew, Greek, and Latin [. . .] For it was in these three languages that the charge against the Lord was written above the cross by Pilate. (*Etymologiae* IX.i.3)

Cf. John 19: 19–20: the *titulus crucis* in Hebrew was ישו הנוצרי מלך היהודים YESHU HANOTZRI MELECH HAYEHUDIM; the Greek was ΙΗΣΟΥΣΟ ΝΑΖΩΡΑΙΟΣ Ο ΒΑΣΙΛΕΥΣ ΤΩΝ ΙΟΥΔΑΙΩΝ; and in Latin IESUS NAZARENUS REX IUDAEORUM (whence INRI) (The three languages are vouched for in Luke 23: 38, but the wording is different: "This is the King of the Jews." Matthew 27: 37 and Mark 15: 27 don't mention the three languages, and the wording is different in each, though all gospels report "King of the Jews."). The strength of Isidore's beliefs in the authority of the Bible and its disciples was typical of scholars in the period between late antiquity and the renaissance – if not well into the nineteenth century.

Jumping forward to the seventeenth century, inquiry into the nature and origin of human language grew from two principal sources: interest in the nature of human reason; and the search for a scientific explanation for the accrued facts about human language. Many interested people recognized that the languages of different nations, even of the markedly different cultures within Europe, Armenia, Persia, and India seemed to be – as they were soon proved to be – related to one another. It was also appreciated that all human languages are remarkably similar, even though one is used by a highly sophisticated people and the other by what Jean-Jacques Rousseau (1755: 104) called "Nations Sauvages." Although belief in God remained strong throughout the period, the Genesis 11 story of the tower of Babel was less and less taken at face value. The doctrine that "God gave man languages" was altered to "God made man, and man invented language."

All human communities have language of a kind, universally recognized as qualitatively different from the language of any other creature. Taken with language internal facts, this suggests that human languages have a common origin. Languages differ superficially, like siblings, and again like siblings, they share many common characteristics. Furthermore, for the rationalist, language is a key to the processes of the mind. Descartes remarked that man was not merely the only rational being on earth, but also the only one with language (Descartes 1968: 74–75). Both claims need hedging. There seems little doubt that some animals are capable of limited reasoning, and a few even have communication systems that may warrant the label *language*. However, human reasoning abilities and human language are undoubtedly far more complex than anything found among animals. Descartes did not, of course, have access to all the twentieth-century research on animals that demonstrates their abilities (cf.Cheney and Seyfarth 1990; Byrne 1995; Dunbar 1996; Whiten and Richard 1997).

From ancient times, it has been obvious that the capacity to reason correlates with the possession and use of language. Identifying the origin of language will throw light on the origin of rationality, concomitantly advancing epistemology and psychology. Although the diversity of languages is open to empirical investigation, the question of how language originated has always been pure guesswork: a quest into human understanding and knowledge.

In his *Essay Concerning Humane Understanding*, John Locke presents the motivation for language as arising from the sociable nature of humans, but what characterizes human language is that it is used to communicate ideas and not merely to indicate objects in the situation of utterance. Continuing to improve on Epicurus, Locke suggests that part of the evidence for this is the human ability to use "general," i.e., generic, terms and universals; and also, to speak of what does not exist or is absent:

> §1. God, having designed Man for a sociable Creature, made him not only with an inclination, and under a necessity to have fellowship with those of his own kind; but furnished him also with Language, which was to be the great Instrument and common Tye of Society. *Man*, therefore, had by Nature his Organs so fashioned, *as to be fit to frame articulate Sounds*, which we call Words. But this was not enough to produce Language; for Parrots, and several other Birds, will be taught to make articulate Sounds distinct enough, which yet, by no means, are capable of Language.
> §2. Besides articulate Sounds, therefore, it was farther necessary that he should be *able to use these Sounds, as signs of internal Conceptions*; and to make them stand as marks for the *Ideas* within his own Mind, whereby they might be made known to others, and the Thoughts of Men's Minds be conveyed from one to another.
> §3. [. . .] Language had yet a farther improvement in the use of general Terms, whereby one word was made to mark a multitude of particular existences. [. . .]
> §4. Besides these Names which stand for *Ideas*, there be other words which Men make use of, not to signify any *Idea*, but the want or absence of some *Ideas* simple or complex, or all *Ideas*together; such as *Nihil* ["nothing"] and in English *Ignorance* and *Barrenness*. [. . .] (Locke 1700: III.i).

Étienne Bonnot de Condillac (1715–1780) became instantly famous on the appearance of his first book *Essai Sur l'Origine des Connoissances Humaines*, "Essay on the origin of human knowledge" (Condillac 1746). Despite being ordained, Condillac denied that human language was a direct gift from God. He was deeply influenced by Locke: "in Condillac as in Locke, reflection is a powerful, active, creative, innate faculty" (Aarsleff 1974: 102). The force that generates language also generates thought. Humans share with beasts the ability to make utterances; the difference is that human reason has assigned functions to certain forms of utterance, and so humans have developed artificial vocal gestures as "conventional symbols":

> The use of language [*signes*] extends little by little the operations of the mind [*ame*]; and in their turn the latter, with greater use perfect the language, rendering their usage more common [*familier*]. Our experience proves that these two things help each other along. (Condillac 1746: II.i.4: 8)

Man's ability to reflect and reason developed using language (Condillac 1746: 80–82). The origin of human language marched in step with the development of ideas. According to antiquity, poetry preceded prose and the primitive languages were very poetical; Condillac adopts the same Romantic view by saying: "It is to Poets that we have the first and perhaps greatest obligations" (Condillac 1746: 211). Condillac's good friend Jean-Jacques Rousseau, in *Discours sur l'Origine et les Fondemens de l'Inégalité Parmi les Hommes*, "On the origin and fundamentals of inequality among men," was of a similar mind:

> Inarticulate cries, many gestures, and some imitative sounds, must have for a long time been the stuff of universal language. In each region these were joined with conventional articulated sounds whose establishment [. . .] is not very difficult to explain; and so one has particular languages, but unsophisticated, imperfect and quite similar to those found today among various Savage Nations. (Rousseau 1755: 104)

Rousseau believes communal animals have language: "There is even reason to believe that the language of beavers and that of ants are gestural and speak only to the eyes. Be that as it may, because both of these languages are natural, they are not acquired; the animals that speak them have them at birth, they all have them, and everywhere the same; they do not change them, they do not make the slightest progress. The language of convention belongs only to man" ('Essai sur l'origine des langues' 1782: 176). Human language could derive from similar visual signs: "visible signs can render a more exact imitation, sounds more effectively arouse interest" (1782: 178), so humans prefer to use sounds.

Johann Gottfried von Herder (1744–1803) read Condillac's *Essai* and, like Condillac, denied that human language is simply a gift from God. Despite being critical of both Condillac and Rousseau, Herder's argument in his prize-winning *Abhandlung über den Ursprung der Sprache* ("Essay on the origin of language" Herder 1772, 1953) owes a large debt to Condillac; and, in emphasizing the particular salience of sounds in the creation of language, he echoes Rousseau.

> As everything in nature utters sounds, nothing is more natural to man as a sensitive being than to assume that nature is alive, able to speak and to act. (Herder 1953: 767)

Any animal will react to a sound made by another creature:

> The plucked chord cannot but vibrate. It invites the echo of sympathetic vibrations even when these are unlikely to be forthcoming, expected or hoped for. [. . .] A sentient being cannot confine any of its vivid sensations within itself; it must give utterance to all of them at the first moment of surprise, without deliberation or intention. [. . .] These sighs, these sounds, are language. (Herder 1953: 733f)

Remnants of such emotive cries are found in all languages but to a greater extent among so-called "savages"; emotive cries are the sap that vitalizes human language (Herder 1953: 736):

> If we then call these spontaneous expressions of feeling 'language', then I do indeed find its origin very natural. It is not only not superhuman but evidently of animal origin. (Herder 1953: 742)

Echoing Epicurus and Lucretius, Herder classes human language as a gift of nature, not of God. There is the usual reference to the uniqueness of human language:

> All animals, down to mute fish, give expression to their sensations. But this does not alter the fact that no animal, not even the most perfect, has so much as the faintest beginning of a truly human language. (Herder 1953: 742)
>
> As men are the only creatures known to possess language, and since it is precisely through language that they distinguish themselves from all animals, where could the investigation more properly begin than from the experiences we have concerning the differences between animals and men? (Herder 1953: 745)

The topic of the origin of language, therefore, promises rewarding insights into the psychology of the human race.

Humans developed language in response to the extent and complexity of human activity:

> The sensitivity, aptitudes, and instincts of animals increase in power and intensity in an inverse ratio to the size and multiplicity of their sphere of activity. (Herder 1953: 747)

This also echoes Epicurus and Locke. Like Locke and Condillac, Herder believed language arose through reflection (Herder 1953: 754):

> [F]rom the very first moment of his existence, man was not an animal but a human being, he possessed a creative and reflective mind even if at his entry into the universe he was as yet not a creature endowed with conscious awareness. (Herder 1953: 795)

Reflection allows humans to distinguish one object from another by identifying its peculiar characteristics ("The word of the soul" implicitly contrasts with the word of God; see below.):

> Man exhibits reflection not only by recognizing clearly or vividly the characteristics of what is in front of him, but also by discerning one or more of its distinguishing characteristics. The first act of apperception gives rise to a clear concept. It is the first judgment of the soul. [. . .] This first token of consciousness was the word of the soul. With it, human language was invented! (Herder 1953: 755)

The lamb, for instance, is identified by its most characteristic feature as *das Blöckende*, "the bleater":

> [T]he sheep bleats! [The soul] has found its distinguishing characteristic. [. . .] White, soft, woolly – the soul sees, touches, remembers, seeks the distinctive characteristic – it bleats, and the soul recognizes it. "Aha!, you are the bleater!" it feels intuitively. [. . .] The sound of bleating perceived by a human soul as the distinguishing mark of sheep became, by virtue of this reflection, the name for sheep, even if the tongue never tried to get around the word. [The

> soul] recognized the sheep by its bleating: this was the sign through which it captured the idea – and what is that other than a word? And what is the whole of human language other than a collection of such words? (Herder 1953: 755–56)

Like Epicurus, Lucretius, Locke, and Condillac, Herder believed that the nature of the human mind that gave rise to language. Plato had described thought as "the conversation of the soul with itself" in *Sophist* (264a–b) or as talking to oneself in *Theatetus* (189e–190a). Herder apparently believed that thought needs language, as did Leibniz and the German Romantic Johann Hamman (1730–1788) (cf. Brown 1967: 58–61); in the late twentieth century, Chomsky (1975: 56–57) and Chomsky (1980: 229–30, 239) reached a similar conclusion. In *Verstand und Erfahrung, Eine Metakritik zur Kritik der reinen Vernunft*, "Understanding and experience: a meta-critique of [Kant's] critique of pure reason" of 1799, Herder wrote that thinking is *innere Sprache*, "inner speech"; and talking is thinking aloud. There is something of this in the twelfth-century remark of Peter Abelard: "sermo generatur ab intellectu et generat intellectum" ("language is generated by the mind and creates understanding") (I haven't been able to find the source in any work of Abelard. This sentence is quoted in Müller (1861: 41) and Joseph (1996: 365).).

Echoing Rousseau, Herder found that vocal symbolization of auditory stimulus caused language to be invented:

> The sheep bleats! [. . .] The turtledove coos! The dog barks! Three words exist because he tried out three distinct ideas. The ideas go into his logic as the words go into his vocabulary. Reason and language together took a timid step and nature came to meet them halfway — through the power of hearing. (Herder 1953: 765)

Thus, in Herder's view "man is a listening, a noting creature, naturally formed for language" (Herder 1953: 765) and "without language man can have no reason, and without reason no language" (Herder 1953: 758–59). Because of human social nature, language is spread across groups and transmitted through generations (Herder 1953: 806–12). These ideas are part of the long tradition stretching back to Epicurus in the fourth century BCE, but for Herder, notice, it is actions and not things that are named:

> Onomatopoeic verbs [*tönende Verba*] are the first elements of power. Onomatopoeic verbs? Actions and not yet anything that acts? [. . . T]he sound had to denote the thing as the thinggave rise to the sound. From verbs it was that nouns derived and not verbs from nouns. The child names the sheep not as a sheep, but as a bleating creature, and hence makes of the interjection a verb. (Herder 1953: 767)

One is reminded of the language that adults use to children in naming creatures: *baa-lamb*, *moo-cow*, and *woof woof*. Perhaps that was partly what led Herder to such a hypothesis, but he was almost certainly influenced by Giambattista Vico (1668–1744): "[A]rticulate language began to take shape in onomatopoeia, which children will happily use to express themselves" (Vico 1999: 184 [447]). "Interjektion" does not refer to the participle *blökende* as a part of speech; Herder

was thinking of the bleating in terms of an emotive cry – which is not altogether consistent with the rest of his story. Once again, however, he seems to have been echoing Vico: "Next, human words were formed by interjections or exclamations, which are articulate sounds caused by the stimulus of violent emotion, and which are monosyllabic in all languages" (Vico 1999: 184 [448]).

Herder is arguing from ontogeny to phylogeny. But his supposition is incorrect, because children do not usually learn verbs first. In part, his motivation is to show that God could not have invented human language because the logical order (according to Aristotle, the Stoics, and Priscian, see Allan 2010) is to name entities first and then to predicate acts and attributes of them, and – to a committed Christian like Herder – God would not, and could not, have been illogical. Several times in his *Essay*, Herder argues against the divine origin of human language (e.g., Herder 1953: 755). To receive the word of God, man would already have had to have language (Herder 1953: 758), so language cannot be God-given. Responding to the claim of Süssmilch (1766: 21) that (part of the) proof for the divine origin of language is that the sounds of all known languages can be reduced to about 20 letters, Herder perceptively notes, following Lambert (1764) that there are far fewer letters than sounds even for German alone (Herder 1953: 737). Later, he says that no two human beings speak exactly the same language (Herder 1953: 814).

Herder assigned verbs priority over nouns in a consciously illogical act in terms of the Western Classical Tradition of linguistic inquiry (Allan 2010). Being a Romantic, he finds that God gave humans passion and sensibility and these, not reason, led to the development of human language (Herder 1953: 829). Like Vico, Condillac, Rousseau, and Hamman, Herder thought the earliest language used was in poetry and song: "What was said by so many of the Ancients and has more recently been often repeated without understanding, derives from the following truth: 'Poetry is older than prose!' For what was this first language other than a collection of elements of poetry?" (Herder 1953: 770). There is a nice counterpoint between realism and Romanticism in Herder's view that "the formation of diverse national languages is a corollary of human diversity" (Herder 1953: 814), and the Tower of Babel was just an oriental poem (Herder 1953: 820). Again, like Condillac, Herder believed in monogenesis: "So as it is likely that all mankind stem from a common source, so too do all languages, and with them the whole chain of human development" (Herder 1953: 821).

Eighteenth-century views on the origin of language differ but little from one another. To the Epicurean belief that language is part of a human being's natural endowment was added a Romantic emphasis on the part played by human passion and sensitivity to nature. And at the same time, greater emphasis was laid on the correlation between the creation of language and the rational, and reflective nature of the human mind. Language is more than naming, and the great weakness in all those early accounts of the origin of language is that there was no discussion of how rules for combining names evolved. It is not sufficient to relegate propositions about entities and their acts or attributes to a human mind that can merely name entities as propositional constituents: syntactic relations between language constituents cannot

be captured in a list with no conventional ordering. Yet, until the late twentieth-century, no one proposed a hypothesis for the origin of syntax.

For most of the twentieth century, linguists eschewed speculation on the origin of language. Interest revived with the interchange of information among the fields of linguistics, primatology, palaeoanthropology, evolutionary biology, neurology, and psychology at the end of the century. Human language is certainly different in kind from animal communication in its complexity, its media (speech, writing, signing), and perhaps its cooperative constraints. There is little doubt that animals are cognizant and store information about the world around them. The evolutionary foundations of semantics and pragmatics

> lie in the internal mental representations that animals have of the things, events, and situations in their environment. [. . .] Rudimentary concepts, ideas, and situations in the world, can reasonably be said to exist in animals' minds, even though they may not ever be publicly expressed in language, or indeed in any kind of communication whatsoever. (Hurford 2007: 5)

Judging from areas of brain activity, many animals re-run episodes from past experience in rapid-eye-movement sleep, just as humans do. There is also the fact that they hide and later retrieve food. Like humans older than three, some higher animals are able to reason their way through the invisible displacement task. What happens is that an object, α, in sight of the animal is placed inside a box, which is then moved behind an obstacle, at which time α is removed; the animal is shown the empty box, which causes it to look behind the obstacle for the missing α. It is thought that children logically deduce the answer whereas animals associate the "last seeing" with a certain location and go looking in that location. Whatever the truth, this is a task that must use mental representation of relative location/space in memory rather than the scene directly perceived.

Interestingly, animals "are capable of proposition-like cognition" (Hurford 2007: 88). They not only recognize different kinds of predators but have different alarm calls for them; and even chickens are smart enough not to bother making alarm calls when there are no conspecifics around. Furthermore, there is some evidence that individual animals modify the sounds and gestures they make to differentiate themselves from others (Hurford 2007: 181). "[I]t is probable that uniquely complex human language could not have evolved without the social ritualized doing-things-to-each-other scaffolding found in many other social species, including our nearest relatives, the primates" (Hurford 2007: 185).

Despite Chomsky's belief that language is primarily a system for the expression of thought (Chomsky 1975: 56–57), all evidence points to its primary function being a medium for the establishment and maintenance of social interactive behavior among members of large communities. Human society demands long-term cooperation and communication which is in part motivated by the difficulties of human childbirth and a long childhood dependence allowing for brain development and skills learning. Cooperation requires trust; consequently, gossip about who is trustworthy is valuable among members of a community: "The integration of deixis and

symbols is the basis of declarative information-giving. The growth of symbolic vocabulary, and the increase in deictic/symbolic integration, can only take off if the animals concerned are disposed to give each other information." This is what must have happened among our remote ancestors (Hurford 2007: 242). That meaningful function of human language had firm foundations before *Homo sapiens* developed.

Primates display many pre-language capabilities which would presumably have been present in early hominids. They vocalize and use gestures that invite reciprocation – but do not vocalize in the absence of emotional stimulus (Corballis 2003: 202). Chimpanzees seem to have a "theory of mind"; that is, they can recognize three or even four levels of intentionality such as "X is trying to deceive me into believing that *p*" or "X is trying to deceive me into believing that X believes that *p*" – which is about what a 4-year-old human can manage (Dunbar 1996: 83–101). In captivity, primates can be taught to associate abstract symbols with entities or actions, but do not do so spontaneously in the wild. In experimental situations, they are capable of simple syntactic structuring (Savage-Rumbaugh et al. 1998). Like many lower animals, primates recognize social relationships (Worden 1998: 152) and know how to establish joint attention (Hurford 2003: 47; Carpenter 2012) – which is a prerequisite for language use (Clark 1996: 274–82) (It seems other creatures also do this, see Mocha et al. (2019).). Importantly, primates display cooperative behavior such as reconciliation and peacemaking in order to maintain group cohesion; and they achieve group bonding through grooming. Primate social groups that devote too little time to grooming fragment and are liable to dissolve (Dunbar 1996, 1998). Non-human primates do not, however, have the respiratory, phonatory, and articulatory ability to speak; nor do they have the cognitive specialization for language. The consensus seems to be that from as early as 500,000 BP, *Homo erectus* and *Homo sapiens neanderthalensis* could probably speak after a fashion, using what Bickerton (1998) calls "protolanguage," in which "there might have existed only two types of linguistic entities: one denoting thing-like time stable entities (i.e. nouns), and another one for non-time stable concepts such as events (i.e. verbs)" (Heine and Kuteva 2002: 394). As early as 170,000 BP *Homo sapiens*, or as late as 50,000 BP *Homo sapiens* would have had linguistic abilities similar to those of today's human beings.

There is much controversy over the part that gesture plays in language; McNeill and Elena (1982) show that gestures used when speaking are precisely synchronized with speech, suggesting that speech and gesture form an integrated system. This leaves to be explained why human language is primarily vocal. To my mind, the most convincing explanation is that hominid language replaced the kind of mainly manual grooming found among other primates (Dunbar 1996). Primates spend 10–20% of their time grooming one another. It is usually one-on-one, and occasionally two or more on one: what it cannot be is one groomer to several groomees. There is a link between neocortex size and social group size that applies to humans as well as to other primates: a human neocortex correlates with a group of about 150 members, which according to Dunbar (1998: 94–95) turns out to be the normal size of communities that share good knowledge of all group members in both traditional and

post-industrial societies. Social understanding seems to be an innate predisposition: "whilst our genes do not determine our ability to understand and interact with other people, they play a strong role in the development of social understanding, and, via this, may ultimately exert a long term and pervasive influence on many aspects of our social lives" (Hughes and Plomin 2000: 61). A cross-cultural comparison shows that, like other primates, human beings spend on average about 20% of their waking hours in social interactions. In order to sustain the bonds that our fellow primates maintain through grooming, humans use language; this enables one-to-many bonding as a speaker/writer/signer addresses a number of hearers/readers/viewers.

So, the grooming hypothesis is a very plausible motivation – and explanation – for the development of spoken language. There is added plausibility in the fact that the primary functions of language are social interactive. Reviewing situations in which children create a language where there was none before, Jackendoff (2002: 100) concludes: "Evidently a community is necessary for language creation, but a common stock of pre-existing raw material is not." Exchange of information is secondary, even though extremely valuable. And information exchange normally has social interactive accompaniment and modifiers: also, whereas other species depend on direct personal observation for information about their fellows, by using language "humans can find out very rapidly about the reliability of an ally or about a friend's good or bad behaviour via third parties" (Dunbar 1998: 96).

The persistent tradition that the earliest language was song probably stems from the fact that song, dance, and ritual are social bonding mechanisms that also serve to differentiate the group from others. These identity-defining characteristics are shared with language.

There is continual controversy over the monogenesis hypothesis (one common ancestor for all human languages) versus plurigenesis (languages developed independently in several different regions). Until someone invents a time machine, we can only speculate on the origin, or origins, of language on the basis of inconclusive circumstantial evidence (but see the very comprehensive and enlightening survey of the origins of language in Johansson 2005).

Humboldt on the Mutual Influence of Language and Culture

> The differences between languages are not those of sounds and signs but those of differing world views. (Humboldt 1963: 246)

Throughout the eighteenth century, language was conceived to have a "genius" that links it to the culture of its speakers (From *Über das vergleichende Sprachstudium in Beziehung auf die verschiedenen Epochen der Sprachentwicklung*, "On comparative philology with special reference to the various periods of language development" (1820).). Although "genius" mostly meant something like a grammarian's opinion of what best matched the grammatical norms of the language, this derives from the classical sense of *genius* as a tutelary god or controlling spirit of the language which determines its distinctive character. Its genius attached the language to its speakers

and their culture: "Nations, like single Men, have their *peculiar* Ideas, [. . .] these *peculiar* Ideas become THE GENIUS OF THEIR LANGUAGE" (Harris 1786: 407). It was certainly this correlation that Condillac had in mind in his *Essai* when he wrote: "Everything confirms that each language expresses the character of the people who speak it" (Condillac 1746: 198); and later in the last chapter of Book III of his *Cours d'études pour l'instruction du Prince de Parme*, he talks about the mutual influence of languages on opinions (i.e., world-view) and opinions on languages (Condillac 1947–1951, II: 90). Better known for an interest in the mutual influences of language and culture is Wilhelm von Humboldt's Introduction to *Über die Kawi-Sprache auf der Insel Java, nebst einer Einleitung über die Verschiedenheit des menschlichen Sprachbaues und ihren Einfluss auf die geistige Entwickelung des Menschengeschlechts*, "On the Kawi language of the island of Java, with an Introduction concerning the variety of human language and its influence on the intellectual development of mankind" (Humboldt 1836–1839).

Humboldt (1767–1835) is more concerned with the nature of language than its origin. Unlike Locke, Condillac, and Herder 1772, for Humboldt, language does not spring from reflection. Instead, like Leibniz, Johann Hamann, and Herder (see Brown 1967: 58–61), Humboldt believed that language is prior to, or at least simultaneous with, thought, such that thought is aided by language: "The real matter of language is, on the one hand, the sound as such, and on the other the totality of sense-impressions and spontaneous mental activities which precede the creation of the concept with the aid of language" (Humboldt 1836: LXI; Humboldt 1999: 52). Humboldt believed, like the Epicureans, Condillac, and Herder, that language arose from the nature of humanity without divine intervention (Humboldt 1999: 24). Language emanates from the collective activity of men, and not from some individual – a view similar to that of Epicurus, Lucretius, and Locke, but dissimilar from Plato or Herder. In Humboldt, it reflects Romantic notions of the collective origin of literature: folk-tales and Homer's epics reputedly derive from multiple authors (Brown 1967: 83):

> As a result of the connection between the individual and the collectivity surrounding him, every significant spiritual activity of the individual belongs also – but only indirectly and in a certain special sense – to the collectivity. The existence of languages proves, however, that there are also spiritual creations which by no means originate in any one individual, to be handed on to other individuals, but which come forth out of the simultaneous, spontaneous activity of all. In languages, in other words, the nations (since a language is that which defines a nation) as such are true and direct creators. (Humboldt 1836: XLVIII; Humboldt 1963: 273)

Like Lucretius and Herder, Humboldt finds that language fulfils a need. And, he expresses a notion that may owe something to Immanuel Kant (1724–1804; Kant 1799) and to Friedrich von Schlegel (1772–1829; Schlegel 1808): that languages form organic structured wholes:

> The production of language is an inner need of mankind, not merely an external vehicle for the maintenance of communication, but an indispensable one which lies in human nature,

> necessary for the development of its spiritual energies and for the growth of a Weltanschauung ["world-view"] which man can attain only by bringing his thinking to clarity and definition by communal contact with the thinking of others. If one now looks upon each language as an attempt to do this – and it is difficult to look at it otherwise – and upon all languages together as a contribution to the fulfilment of this basic human need, it may well be assumed that the language-creating energy in mankind will not rest until it has brought forth, whether in one place or everywhere, whatever accords most perfectly with its demands. (Humboldt 1836: xxv–xxvi; Humboldt 1963: 258)

There is a slight echo of Herder's view that activity is salient for language creation: "To describe languages as a *work of the spirit* is a perfectly correct and adequate terminology, if only because the existence of spirit as such can be thought of only in and as activity" (Humboldt 1836: lvii–lviii; Humboldt 1999: 49).

Humboldt was a Romantic: "For man, as a species, is a singing creature, though the notes, in his case, are also coupled with thought" (Humboldt 1999: 60). But he is more sophisticated than most Romantics when he recognizes that language use is goal-directed behavior, as revealed in the functional motivations for language structures: "The analysis essential to the study of linguistic structure compels us, in fact, to look upon language as a method which pursues certain aims by certain means, and hence to consider it truly a creative formation of a given nation" (Humboldt 1836: lviii; Humboldt 1963: 281). The final clause in this quote echoes an earlier statement "that languages are bound to and dependent on the national groups which speak them" (Humboldt 1963: 255 [Humboldt 1999: 24]). That is, languages reflect the culture and mentality of their speakers. Because language and thought are intimately connected, and the grammars of different languages are structurally different, it follows that grammatical differences between languages indicate different ways of thinking and perceiving: "The persistent *work of the mind* in using language has a definite and continuing influence even on the true structure of the language and the actual pattern of its forms; but it is a subtle influence, and sometimes escapes notice at first sight" (Humboldt 1999: 148). Speaking and understanding are two sides of the same coin: "Conversing together is never comparable with the transfer of material. In the understander as in the speaker, the same things must be evolved from the inner power of each; and what the former receives is merely the harmoniously attuning stimulus" (Humboldt 1836: lxx; Humboldt 1999: 57). This suggests the remarkably modern observation that understanding proceeds via analysis-by-synthesis (see Allan 2001; Sperber and Wilson 1995).

There was no great novelty in Humboldt recognizing that children do not inherit a language but learn whichever is/are in their linguistic environment. Nor was it novel to observe that adults find it difficult to learn a second language because they are hampered by adherence to the characteristics of their mother-tongue:

> If children are transplanted before they learn their native tongue, they develop their linguistic capacity in the foreign one. This undeniable fact, it might be said, clearly shows that language is the mere reproduction of what is heard, depending entirely on social intercourse without consideration of the unity and diversity of the people involved. In the first place,

> however, it has by no means been determined by exact tests that the inclination towards such children's native speech did not have to be overcome at some cost to the finest nuance of skill in the adopted language. But even disregarding this possibility, the most natural explanation is simply that human beings are everywhere human and the development of linguistic capacity may therefore take place with the aid of any given individual. That does not mean that it comes any less from the individual's innate nature; only, since it also needs outer stimulus as well, it must become analogous to whatever stimulus it receives. This it can do since all human languages are interrelated in some sense. (Humboldt 1836: LXXIIf; Humboldt 1963: 292f)

Yet, there is a commonality among languages. What others refer to as "general" or "universal" grammar, Humboldt refers to as "the congruence of all human tongues." The human predisposition to use language needs an external stimulus for the individual to learn the language(s) spoken in their own particular environment.

For Humboldt, language is a reflection of the individual's subjective perception of the world – there is no direct correlation between the forms of language and the speaker's referent; it is the speaker's cognitive awareness of the referent that is indicated by the language expression:

> Just as no concept is possible without language, so no object is possible without it for the psyche, since even external ones receive their intrinsic substance only through language. For words are born of the subjective perception of objects; they are not a copy of the object itself but of the image of it produced in the psyche by its perception. And since subjectivity is unavoidably mingled with all objective perception, one may – quite independently of language – look upon each human individuality as a singular unique standpoint for a world-view. (Humboldt 1836: LXXIV; Humboldt 1963: 293f)

Although Humboldt does not explicitly say so, it is clear that individual subjectivity is culturally endowed because different languages incorporate different world-views:

> Now everyone uses language to express his most particular individuality; for it always proceeds from the individual, and each uses it primarily for himself alone. Yet it suffices everyone, insofar as words, however inadequate, fulfil the urge to express one's innermost feelings [Herder would have approved this]. Nor can it be claimed that language, as a universal medium, reduces these differences to a common level. It does indeed build bridges from one individuality to another, and is a means of mutual understanding; but in fact it enlarges the difference itself, since by clarifying and refining concepts it produces a sharper awareness of how such difference is rooted in the original cast of mind. The possibility of serving to express such diverse individualities seems, therefore, to presuppose in language itself a perfect lack of character, with which, however, it can by no means be reproached. It actually combines the two opposing properties of dividing itself, as one language in the same nation, into an infinity of parts, and as such an infinity, of uniting itself, as one language of a particular character, against those of other nations. (Humboldt 1836: CCXII; Humboldt 1999: 151)

Also

> Language is the external manifestation, as it were, of the spirit of a nation. Its language is its spirit and its spirit is its language. (Humboldt 1836: LIII; Humboldt 1963: 277)

And

> Every language receives a specific originality through that of the nation, and has on the latter a uniformly determining reverse effect. (Humboldt 1836: CCXIV; Humboldt 1999: 152)

Humboldt is saying that languages unite speakers because each language has its "genius" (*Sprachgefühl*) that differentiates it and its speakers from the languages and people of other nations; but, at the same time, every individual uses language in a different way that "is rooted in the original cast of mind" – a very Herder-like remark. The "genius" of a language captures a world-view that makes it difficult for the non-native speaker to engage with: "Every language sets certain limits to the spirit of those who speak it; it assumes a certain direction and, by doing so, excludes many others" (Humboldt 1963: 245; *Einleitung in das gesamte Sprachstudium*, "Introduction to general linguistics," 1810–1811). He also says: "Die Sprache ist das bildende Organ des Gedanken ["Language is the formative organ of thought"] (Humboldt 1836: LXVI; Humboldt 1999: 54).

> [E]ach language draws a circle around the people to whom it adheres which it is possible for the individual to escape only by stepping into a different one. The learning of a foreign language should therefore mean the gaining of a new standpoint toward one's world-view, and it does this in fact to a considerable degree, because each language contains the entire conceptual web and mental images of a part of humanity. If it is not always purely felt as such, the reason is only that one so frequently projects one's own world-view, in fact one's own speech habits, onto a foreign language. (Humboldt 1836: LXXV; Humboldt 1963: 294)

Here, we see that Humboldt is truly an originator of the so-called "Sapir-Whorf," "Whorfian," or "linguistic relativity" hypothesis.

Humboldt judged that because language and thought are intimately connected, the grammatical differences between languages are manifestations of different ways of thinking and perceiving. The structure of language affects perceptual processes and also the thought processes of speakers. Language mediates world-view such that different world-views correlate with different language structures that no sole individual can change; consequently, languages are stable organic wholes. These views arose in part from German Romanticism in which the individual is only significant as part of a nation and furthermore is powerless to alter it as an individual (Brown 1967: 116).

Humboldt enthused Heymann Steinthal (1823–1899; see Steinthal 1848), who in turn inspired William Whitney (1827–1894) to write in *The Life and Growth of Language*:

> Every single language has thus its own peculiar framework of established distinctions, its shapes and forms of thought, into which, for the human being who learns that language as his "mother-tongue", is cast the content and product of his mind, his store of impressions, however acquired, his experience and knowledge of the world. This is what is sometimes called the "inner form" of language – the shape and cast of thought, as fitted to a certain body of expression. But it comes as the result of external influence; it is an accompaniment of the process by which the individual acquires the body of expression itself. [. . .] It amounts

> simply to this: that the mind which was capable of doing otherwise has been led to view things in this particular way, to group them in a certain manner, to contemplate them consciously in these and those relations. (Whitney 1875: 21–22)

Whitney was the link to Franz Boas.

Boas

German-born Franz Boas (1858–1942) studied Eskimos on Baffin Island in 1883 and emigrated to the United States in 1886, when he began studying the Kwakiutl in the Pacific Northwest. In 1895, he began working with the American Museum of Natural History and in 1896 joined Columbia University, where he became Foundation Professor of Anthropology in 1899. He encouraged cross-fertilization between the fields of human evolution, archeology, language, and culture. At the time, racism was rife as Americans from north-European backgrounds were alarmed by the influx of "inferior races" such as Jews and south Europeans. Perhaps because of his own liberal Jewish background, Boas was an early critic of racial superiority claims and of race being used as an explanation for physical types. Using a biometric measurement, the cephalic index (relation of skull length to width), long held to be a primary indicator of race, Boas showed that the index changed radically within a generation for which the only explanation is changed physical environment, diet, and social environment. Consequently, the cephalic index is no sure indicator of race.

Entirely harmonious with this background sketch is Boas' legacy to twentieth-century linguistics: concern that all languages and cultures should be treated equally, each being explained in its own terms, and that languages should be investigated with systematic rigor and without prejudiced preconceptions about their linguistic structure. In this, Boas may have been inspired by Whitney:

> In judging other languages, then, we have to try to rid ourselves of the prejudices generated by our own acquired habits of expression, and to be prepared to find other peoples making a very different selection from our own of those qualifications and relations of the more material substance of expression which they shall distinctly represent in speech, and also sharing these out very differently among the different modes of formal expression. (Whitney 1875: 222)

Boas' work on Native American languages may well have been at least indirectly and partially inspired by Humboldt, who was not only "among the earliest linguists to extend systematic comparative research into non-Indo-European languages" (Drechsel 1988: 236) but also one of the first to write about Native American languages (e.g., in Humboldt 1836, and also in letters). Boas would have been familiar with the work of American ethnologist Daniel Brinton and most probably Brinton's *The Philosophic Grammar of American Languages, as Set Forth by Wilhelm von Humboldt: With the Translation of an Unpublished Memoir by him on the American Verb* (Brinton 1885).

Linguistic tradition from Plato to Whitney would have confirmed Boas' view that languages help classify experience because it has to be expressed using whatever forms of language are at the speaker's disposal:

> Since the total range of personal experience which language serves to express is infinitely varied, and its whole scope must be expressed by a limited number of phonetic groups [= morphemes], it is obvious that an extended classification of experiences must underlie all articulate speech. (Boas 1911: 24)

For Boas, then, experience and culture are reflected in language, with the result that the principles of classification will often differ from language to language:

> [T]he groups of ideas expressed by specific phonetic groups show very material differences in different languages, and do not conform by any means to the same principle of classification. To take again the example of English, we find that the idea of WATER is expressed by a great variety of forms: one term serves to express water as a LIQUID; another one, water in the form of a large expanse (LAKE); others, water as running in a large body or in a small body (RIVER and BROOK); still other terms express water in the form of RAIN, DEW, WAVE, and FOAM. It is perfectly conceivable that this variety of ideas, each of which is expressed by a single independent term in English, might be expressed in other languages by derivations from the same term.
>
> Another example of the same kind, the words for SNOW in Eskimo, may be given. Here we find one word, *aput*, expressing SNOW ON THE GROUND; another one, *qana*, FALLING SNOW [this is incorrect, the word means "snowflake"]; a third one, *piqsirpoq*, DRIFTING SNOW; and a fourth one, *qimuqsuq*, A SNOWDRIFT. [. . .]
>
> As an example of the manner in which terms that we express by independent words are grouped under one concept, the Dakota language may be selected. The terms *naxta'ka* TO KICK, *paxta'ka*TO BIND IN BUNDLES, *yaxta'ka* TO BITE, *ic'a'xtaka*TO BE NEAR TO, *boxta'ka* TO POUND, are all derived from the common element *xtaka* TO GRIP, which holds them together, while we use distinct words for expressing the various ideas.
>
> It seems fairly evident that the selection of such simple terms must to a certain extent depend upon the chief interests of a people; and where it is necessary to distinguish a certain phenomenon in many aspects, which in the life of the people play each an entirely independent role, many independent words may develop, while in other cases modifications of a single term may suffice.
>
> Thus it happens that each language, from the point of view of another language, may be arbitrary in its classifications; that what appears as a single simple idea in one language may be characterized by a series of distinct phonetic groups in another. (Boas 1911: 25–26)

In late 1994, there was much discussion on the LINGUIST List (http://www.linguistlist.org) about the number of Yup'ik words for snow and ice; it was suggested that there is a problem determining what counts as a word in Yup'ik because many of the "words" correspond to compounds or phrases in English. When this is taken into account, the difference between the two languages is by no means so stark. There is also the fact that English has *slush*, *sleet*, *blizzard*, *avalanche*, *powder*, *flurry*, *drift*, and so forth. Benjamin Lee Whorf wrote:

> We have the same word [*snow*] for falling snow, snow on the ground, snow packed hard like ice, slushy snow, wind-driven flying snow – whatever the situation may be. To an Eskimo, this all-inclusive word would be almost unthinkable (Whorf 1956: 216. [Whorf 1940b])

According to the late Jerry Sadock (p.c.), Whorf was wrong and the all-inclusive thinkable word in Eskimo is *aput.* John Lucy criticizes Brown and Lenneberg (1954) for expressing a view that both English and Eskimo speakers can talk equally well about snow and types of snow. Lucy says that in English *snow*, *good-packing snow*, and *bad-packing snow* are "*varieties of snow*, whereas there is no evidence at all that the Eskimo regard these three referents as varieties of the same thing" (Lucy 1992b: 149). If Sadock is right about *aput,* it is likely that Lucy is wrong.

The usual explanation for differences such as that between English and Eskimo is the principle of least effort (Zipf 1949): there is a tendency for the length of a language expression to correlate with its significance in the everyday life of the speech community, and hence frequency of occurrence (The evidence for this is overwhelming, see Allan (2001) for many examples. Lucy dismisses Zipf's principle of least effort as grounded in form and frequency rather than structure and content; this is a narrow view of the letter rather than the spirit of Zipf's principle.); the Eskimo environment makes it significant for Eskimos to distinguish various kinds of snow by simple nouns, whereas the environment in which the English language developed presents little need for such nouns. As foreshadowed by Boas (1911: 26, quoted above), the point is that phenomena are normally linguistically categorized according to those of their characteristics that are perceived or conceived of as being significant within a given context or set of contexts. Lucy claims that "to say that the Eskimo have lexicalized what for us are complex noun phrases (because they use them so frequently) essentially presupposes that they originally had complex noun phrases of the same type as we have, that is, with the unified conceptual content [. . .] 'snow'"(Lucy 1992b: 161). However, no such presupposition is warranted. On a naïve and radically oversimplified account, the prehistoric Eskimo frequently encountered bits of environment which were named *aput*, *qana*, *piqsirpoq*, *qimuqsuq*, etc.; the prehistoric Anglo-Saxon did not. It is not irrelevant that an expert almost always has a more extensive vocabulary (neologisms and abbreviations) in their area of expertise than a lay person as part of the jargon that enables an expert to make finer distinctions than the layman needs. Expert and layman may see and even speak about the same referent, but they have different conceptions of it (Allan 2001: 88, 333); and these different conceptions will be reflected in the language used. Language expressions evolve in direct response to their usefulness and usability in the community that employs them.

Sapir

> When it comes to linguistic form, Plato walks with the Macedonian swineherd, Confucius with the head-hunting savage of Assam. (Sapir 1949a: 219 [Sapir 1921])
>
> It would be possible to go on indefinitely with such examples of the incommensurable analyses of experience in different languages. The upshot of it all would be to make very real to us a kind of relativity that is generally hidden from us by our naïve acceptance of fixed habits of speech as guides to an objective understanding of the nature of experience. This is the relativity of concepts or, as it might be called, the relativity of the form of thought. (Sapir 1949b: 159 [Sapir 1924])

Edward Sapir (1884–1939) was born in Germany but moved to America aged five. His 1905 MA was a critique of Herder's *Ursprung*, from which he published Sapir (1907). He was already a student of Boas, who inspired him to record endangered Native American languages before they were lost forever. Sapir's 1909 Ph.D. dissertation was on Takelma (a language isolate), and during his lifetime, he worked on 35 different Native American languages. During the late 1920s at the University of Chicago, Sapir was teaching and thinking a great deal about culture, psychology, and social science methodology, drawing on Jung's writings on personality (Jung 1953) and Koffka's gestalt psychology (Koffka 1935). It was during this period that he began to write about linguistic relativity. In 1931, Sapir became Sterling Professor of Anthropology and Linguistics at Yale University. There, his conception of grammatical process and his interest in the study of meaning as integral to the theory of grammar contrasted sharply with the views of his younger colleague Leonard Bloomfield, whose dismissal of semantics adversely affected linguistics in North America until the later 1960s (Allan 2010, inter alios). Sapir carefully distinguished collective conventional patterns of behavior from the personality patterns of actual individuals. Late in life, he collaborated with Harry Sullivan (Sullivan 1955) in looking at social interaction as the locus of cultural dynamics.

Sapir adopted Boas' views on unprejudiced egalitarian treatment of languages and the concern that endangered Native American languages should be rigorously investigated. It has been alleged by Sampson (1980) and Joseph (1996) that Sapir's book *Language* (Sapir 1921) says little about linguistic relativity; but Chapter v "Form in Language: Grammatical Concepts" counters that claim. Sapir takes the Leibniz-Herder-Hamman-Humboldt line that thought and language are interrelated, with thought dependent on language:

> Language is primarily a pre-rational function. It humbly works up to the thought that is latent in, that may eventually be read into, its classifications and its forms; it is not, as is generally but naively assumed, the final label put upon the finished thought.
>
> Most people, asked if they can think without speech, would probably answer, "Yes, but it is not easy for me to do so. Still I know it can be done." Language is but a garment! But what if language is not so much a garment as a prepared road or groove? (Sapir 1949a: 15 [Sapir 1921])
>
> Language and our thought grooves are inextricably interrelated, are, in a sense, one and the same. [. . .] Language is a particular *how* of thought. (Sapir 1921: 217–18)

Sapir's fullest statement on linguistic relativity appeared in "The status of linguistics as a science":

> Human beings do not live in the objective world alone, nor alone in the world of social activity as ordinarily understood, but are very much at the mercy of the particular language which has become the medium of expression for their society. It is quite an illusion to imagine that one adjusts to reality essentially without the use of language and that language is merely an incidental means of solving specific problems of communication or reflection. The fact of the matter is that the 'real world' is to a large extent unconsciously built up on the language habits of the group. No two languages are ever sufficiently similar to be considered as representing the same social reality. The worlds in which different societies live are

> distinct worlds, not merely the same worlds with different labels attached. [. . .] We see and hear and otherwise experience very largely as we do because the language habits of our community predispose certain choices of interpretation. (Sapir 1929: 209–10)

This is very Humboldtian and pre-dates Sapir's association with Whorf at Yale. We don't know to what extent Sapir was familiar with Humboldt's work (The statement by Gumperz and Levinson (1996: 4) that "Sapir wrote a master's thesis on a comparison between Herder and Humboldt" is misleading, if not false.). As a Germanist, he could have read the *Gesammelte Schriften* "Collected writings" (Humboldt 1903–1936), because by 1908 the first seven volumes had been published, and these contain most of the linguistically relevant works. It is notable that Sapir's discourses on typology (Sapir 1921, Chapter VI; Sapir 1933) rework Humboldt's classifications (in e.g., Humboldt 1999: 102ff) – although Sapir does not mention Humboldt. Also, reminiscent of Humboldt is the following:

> The relation between language and experience is often misunderstood. Language is not merely a more or less systematic inventory of the various items of experience which seem relevant to the individual, as is so often naively assumed, but is also a self-contained, creative symbolic organization, which not only refers to experience largely acquired without its help but actually defines experience for us by reason of its formal completeness and because of our unconscious projection of its implicit expectations into the field of experience. [. . .] Such categories as number, gender, case, [etc. . . .] are systematically elaborated in language and are not so much discovered in experience as imposed upon it because of the tyrannical hold that linguistic form has upon our orientation in the world. Inasmuch as languages differ very widely in their systematization of fundamental concepts, they tend to be only loosely equivalent to each other as symbolic devices and are, as a matter of fact, incommensurable. (Sapir 1931: 578)

There is also evidence of the influence of gestalt psychology (in this context, German *Gestalt* is possibly best translated "a single mental image"). Sapir and (later) Whorf were familiar with the work of Kurt Koffka. Both would certainly have been aware of such gestaltist notions as the "Law of Proximity" that proximal elements tend to be grouped by the mind and seen as belonging together; the "Law of Symmetry" – the mind seeks symmetry; the "Law of Continuity," that the mind extends a pattern, even when it is broken up (For instance, one never sees a chair in its entirety, but one can supplement what is seen by what one knows must be there. One rarely hears everything that another person says, but fills the gaps to make sense of what has been heard); and finally the "Law of Common Fate," that elements apparently moving in the same direction form a unit. These laws apply not only to images, but to thought processes, memories, and our understanding of time and motion. An important aspect of gestalt theory is the differentiation of figure from ground: in Fig. 10.1a one can see, either a black vase on a white ground, or a pair of white faces on a black ground; but not both at the same time. In Fig. 10.1b, there are several different ways to perceive the figure: Is it a set of interconnected squares, triangles, and trapeziums; or is it a cube, and if so, which face is to the front? The Sapir-Whorf hypothesis was that different language communities select different gestalts, different figures, and grounds in a manner analogical to the different potentials of Fig. 10.1. The

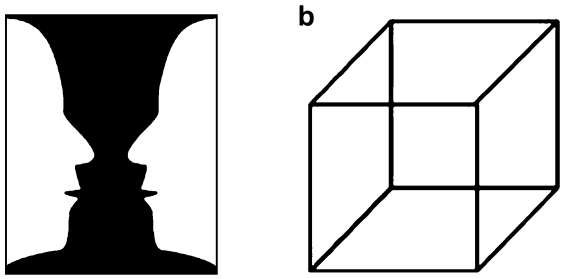

Fig. 10.1 Figure and ground change in ambiguous figures

importance of such figure-ground distinctions have more recently been employed in cognitive linguistics, especially the work of Leonard Talmy (see Talmy 2000, Volume I).

Perhaps because Sapir (1931: 578), quoted above, is the abstract of a paper and not its body (which no longer exists), the words "the tyrannical hold that linguistic form has upon our orientation in the world" constitute a much stronger statement of linguistic determinism than is found elsewhere in the writings of either Sapir or Whorf. There is also an explication of how language shapes thought: "Language [. . .] defines experience for us by reason of its formal completeness" (Sapir 1931: 578). Boas, Sapir, and Whorf all believed that language systems need to be investigated as wholes in which each linguistic element has a function. This is heir to the German Romantic tradition stemming from Leibniz that languages are organic wholes (Humboldt and Whitney's "inner form"). Like Humboldt, Sapir adds that "languages differ very widely in their systematization of fundamental concepts, they tend to be only loosely equivalent to each other as symbolic devices": a view confirmed earlier by Boas and later by Whorf (In an attempt to explain such notions to the outside world, Sapir (1949b: 153 [Sapir 1924]) wrote: "To pass from one language to another is psychologically parallel to passing from one geometrical system of reference to another" (e.g., from Euclidean geometry in which parallel lines are always equidistant to hyperbolic geometry in which they curve away from each other or elliptical geometry in which they curve toward each other. Non-Euclidean forms are nicely demonstrated by the Möbius band; see http://mathworld.wolfram.com/MoebiusStrip.html). It is notable that Whorf (1956: 58, in a paper written in 1936) makes a similar analogy between different languages and different geometries.). Sapir (1949a: 82–93 [Sapir 1921]) made a detailed and instructive comparison of the grammatical and semantic differences among English, German, Yana, Chinese, and Kwakiutl translation equivalents of *The farmer killed the duckling*.

Boas taught respect for Native American languages and cultures; his student Sapir shared this respect and adopted Boas' teaching that different cultural groups conceptualize the "same" denotata in different ways and that their languages will reflect these differences. Sapir's point of view was in part motivated by his special interest in culture. "Culture may be defined as *what* a society does and thinks" he wrote (Sapir 1949a: 218 [Sapir 1921]); and later "Language is primarily a cultural or social product and must be understood as such" (Sapir 1929: 214). Four years after

that, he was describing language as "a culture-preserving instrument" (Sapir 1949b: 17 [Sapir 1933]). Perhaps under influence from the eighteenth- and nineteenth-century German Romantics, Sapir came to believe that language may not be the reflection of thought that Boas perceived, but the groove that guides the direction of thought. To what extent Sapir truly believed that linguistic form has a "tyrannical hold [. . .] upon our orientation in the world" we shall never know; one suspects this statement may have been hyperbole. But the mind behind it mentored Ben Whorf, whose work displays many evidences of Sapir's influence.

Whorf

> [T]he "linguistic relativity principle" [. . .] means, in informal terms, that users of markedly different grammars are pointed by their grammars toward different types of observations and different evaluations of externally similar acts of observation, and hence are not equivalent as observers but must arrive at somewhat different views of the world. (Whorf 1956: 221 [Whorf 1940a])

Benjamin Lee Whorf (1897–1941) graduated from MIT in 1918 as a chemical engineer and was employed for the rest of his life as a fire prevention engineer inspector for the Hartford Fire Insurance Company. He was highly regarded and often given leave to pursue his interest in linguistics and anthropology. In the mid-1920s, perceiving a conflict between science and religion, he studied Hebrew. He soon took up Nahuatl and Maya, and published a paper on the Aztecs in 1928. In 1930, the Social Science Research Council funded him to go to Mexico to work on Nahuatl and while there he uncovered "definite, clearly demonstrable rapport between Nahuatl hieroglyphs and early Maya ones" (Whorf 1956: 50 [Whorf 1932]). By this time, he had met Sapir, but only became a close associate after Sapir moved to Yale in 1931. Enrolling in a Ph.D. program at Yale, Whorf interacted with many linguists and anthropologists, though he never completed the degree. Nonetheless, in 1936, he was appointed Honorary Research Fellow in Anthropology at Yale; and in 1937, the university awarded him the Sterling Fellowship. He was a lecturer in Anthropology from 1937 to 1938 when he was diagnosed with the cancer that killed him in 1941.

Sapir encouraged Whorf to further study Uto-Aztecan languages, and Whorf worked on Hopi from 1932 until his death. Probably under influence from Sapir and gestalt psychology (Whorf was familiar with Koffka's work and often mentioned gestalts), he came to believe that the Hopi interpretation of time, events, and space was a function of Hopi grammar (Whorf 1936, 1938, 1953). For instance, Whorf reviews aspectual forms in Hopi verbs that denote "vibratory phenomena and the punctual events to which they are related," concluding that

> The Hopi aspect-contrast which we have observed, being obligatory upon their verb forms, practically forces the Hopi to notice and observe vibratory phenomena, and furthermore encourages them to find names for and classify such phenomena. (Whorf 1956: 55f [Whorf 1936])

This is perhaps Whorf's earliest statement about linguistic relativity, and it takes a very reasonable, and arguably incontrovertible, position with respect to the effect of language on the conceptualizing of phenomena. In order to speak a language correctly, one has to cut the denotata in certain ways.

The effect of language on thinking was brought home to Whorf in his work as a fire insurance assessor. In "The relation of habitual thought and behavior to language," he gave several examples, such as the unrecognized fire hazard from *empty gasoline drums* arising from interpreting "empty" as "void of any danger from gasoline" – when in fact the vapor remaining in the drum is highly flammable. Another example was from a wood distillation plant in which metal stills had been painted with *spun limestone* (Quote from Sapir (1929: 209).):

> After a period of use, the fire below one of the stills spread to the "limestone," which to everyone's great surprise burned vigorously. Exposure to acetic acid fumes from the stills had converted part of the limestone (calcium carbonate) to calcium acetate. This when heated in a fire decomposes, forming inflammable acetone. Behavior that tolerated fire close to the covering was induced by the use of the name "limestone," which because it ends in "-stone" implies non-combustibility. [. . .]
>
> Such examples, which could be greatly multiplied, will suffice to show how the cue to a certain line of behavior is often given by the analogies of the linguistic formula in which the situation is spoken of, and by which to some degree it is analysed, classified, and allotted its place in that world which is "to a large extent unconsciously built up on the language habits of the group." And we always assume that the linguistic analysis made by our group reflects reality better than it does. (Whorf 1956: 136f [Whorf 1941b])

Such practical experience of the effects of labeling on conceptualization is here explicitly combined with the tradition of linguistic relativity that stretches back through Sapir and Boas to Humboldt. This was what Whorf applied in his investigations of Native American languages.

There is no doubt about Whorf's debt to Sapir and Boas. For instance, there are echoes of Sapir in the following:

> The investigator of culture should hold an ideal of linguistics as that of a heuristic approach to problems of psychology. ('A linguistic consideration of thinking in primitive communities' Whorf 1956: 73)

And also:

> Which was first: the language patterns or the cultural norms? In the main they have grown up together, constantly influencing each other. But in this partnership the nature of the language is the factor that limits free plasticity and rigidifies channels of development in the more autocratic way. This is so because a language is a system, not just an assemblage of norms. (Whorf 1956: 156 [Whorf 1941b])

Against the view expressed here, there is evidence that cultural needs give rise to new habits: for instance, the borrowing of new color terms to expand the indigenous stock, e.g., in Mesoamerica; and grammatical borrowing is not rare among languages in contact.

Whorf echoes Boas when he says that investigation of "man's knowledge of his own intellectual makeup" requires surveying a very large number of languages of different types and "a grammar of each language worked out scientifically and on the basis of the language's own patterns and classes, and as free as possible from any general presuppositions about grammatical logic" ("A linguistic consideration of thinking in primitive communities"; Whorf 1956: 77). Whorf believed that the investigation of many languages would concomitantly be an investigation of many ways of thinking, and so illuminate human cognitive capabilities. To study an exotic language is the best way to jar us out of our habitual way of thinking (Whorf 1956: 138 [Whorf 1941b]).

The so-called "Whorfian hypothesis" is a considered restatement of the Boas and Sapir take on the linguistic relativity hypothesis. Perhaps the briefest statement of it is "Facts are unlike to speakers whose language background provides for unlike formulation of them" (Whorf 1956: 235 [Whorf 1941a]). The definitive statement is from "Science and linguistics," written for non-linguists.

> [T]he background linguistic system (in other words the grammar) of each language is not merely a reproducing instrument for voicing ideas but rather is itself the shaper of ideas, the program and guide for the individual's mental activity, for his analysis of impressions, for his synthesis of his mental stock in trade. Formulation of ideas is not an independent process, strictly rational in the old sense, but is part of a particular grammar, and differs, from slightly to greatly, between different grammars. We dissect nature along lines laid down by our native languages. The categories and types that we isolate from the world of phenomena we do not find there because they stare every observer in the face; on the contrary, the world is presented in a kaleidoscopic flux of impressions which has to be organized by our minds – this means largely by the linguistic systems in our minds. We cut nature up, organize it into concepts, and ascribe significances as we do, largely because we are parties to an agreement to organize it in this way – an agreement that holds throughout our speech community and is codified in the patterns of our language. The agreement is, of course, an implicit and unstated one, BUT ITS TERMS ARE ABSOLUTELY OBLIGATORY; we cannot talk at all except by subscribing to the organization and classification of data which the agreement decrees.
>
> [. . .] We are thus introduced to a new principle of relativity, which holds that all observers are not led by the same physical evidence to the same picture of the universe, unless their linguistic backgrounds are similar. Or can in some way be calibrated. (Whorf 1956: 212–14 [Whorf 1940b])

It is generally agreed by all but the most bigoted that a language necessarily requires us to pay attention to certain aspects of phenomena. For instance, English forces its speakers to pay attention to definiteness and countability of objects but doesn't force us to identify the relative position or location of an object; other languages are different in these respects. Perhaps Whorf was overstating the case in saying "we cannot talk at all except by subscribing to the organization and classification of data which [the grammar of the language] decrees" (Whorf 1940b), but we cannot speak grammatically and felicitously unless we do so comply. An individual can only properly communicate when abiding (for the most part) by the grammatical rules and conventions for language usage in their community. And note the last two sentences quoted above, where Whorf is claiming that people from different language backgrounds can "calibrate" their pictures of the universe. This explains why Whorf could be confident, he understood Hopi, Shawnee, and Nootka well enough to

explicate the meanings of expressions within those languages. Whorf did not deem that all conceptual activity is linguistically determined. Those who claim that Whorf believed language determines thought should take heed of the following:

> The statement that "thinking is a matter of LANGUAGE" is an incorrect generalization of the more nearly correct idea that "thinking is a matter of different tongues." (Whorf 1956: 239 [Whorf 1941a])

This clearly allows for an individual to accommodate different ways of thinking by learning different languages and the world-views of their speakers. It is not even necessary to speak the other person's language, simply to know about its structure (Whorf 1956: 263 [Whorf 1942]) – a view which Black (1959: 235–236) rejects as special pleading from the theory's own promulgator, but which can alternatively be interpreted as evidence that Whorf himself believed in only a weak form of the "Whorfian hypothesis."

A weak version of the "Whorfian hypothesis" is that a language directs its speakers toward certain aspects of perceived phenomena – but, because perception is independent of language, other aspects of phenomena can be commented upon, if desired, by circumlocution, or by the novel use of a language expression. A speaker may use an unusual classification (ranking on a scale between dead metaphor and innovation) to get some particular point across. For example, tall people can be classified by the "long" classifier instead of the "people" classifier in some Bantu languages and in the Mayan language Yucatec. This suggests that the basis for classification is the characteristic perceived or believed to be salient in the referent – the figure against the (back) ground.

Any study of color terms across languages shows that people name colors according to the conventions of their language. Color naming is systematic, governed by a combination of neurophysiological response to the sense data (Kay and McDaniel 1978) and choice of what to focus on within the color spectrum. Rosch (1973) showed that the Dani (Papuan, Irian Jaya), who have two basic color terms, can readily distinguish and refer to all the colors that have distinct names in English – but their language doesn't make it so easy for them as it is for English speakers. The way they do it is to compare the color to something in the environment e.g., *the colour of mud*. The presumption is that the Dani speech community has not hitherto had any great need to make frequent reference to the same number of colors as the English speech community. The conclusion to be drawn is that, although the sensory data in the color spectrum is the same for all human beings, languages name parts of the field differently. Western Dani *laambu* divides the spectrum in half. Its differential value is very different from English *yellow*, even though *laambu* is a possible translation for English *yellow*. The value of *yellow* is only one-eleventh of the color spectrum: thus, *laambu* implies not-*mili* "not cool-dark," whereas *yellow* implies "not-white, not-red, not-green, not-blue, not-black, not-brown, not-pink, not-purple, not-orange, not-grey."(This assumes these color terms are "basic" in the sense of Berlin and Kay (1969), which is not uncontroversial; see MacLaury (1997).) On a strong version of the "Whorfian hypothesis," the Dani would be

unable to see all the hues that exist for us, but that is simply not the case. They can not only see but also refer to all the colors that an English speaker can see and refer to. It might be countered that Whorf was concerned with the concepts people habitually use in interpreting their experience and not the potential modes of expression open to them. This of course is exactly because he never postulated the strong version of the "Whorfian hypothesis."

Whorf wrote (as quoted previously) "users of markedly different grammars are pointed by the grammars toward different types of observations and different evaluations of externally similar acts of observation, and hence are not equivalent as observers but must arrive at somewhat different views of the world" (Whorf 1956: 221). By "externally similar acts of observation" he meant "what (external to the observer) is observed," leaving "what (internal to the observer) the observer conceives of as being perceived" to be elaborated under consideration of the observers with markedly different grammars and their views of the world. In Whorf's view, the perception and conception will be different for two people using markedly different grammars; in fact, this is the very crux of the Whorfian hypothesis. Given this interpretation, there is an enormous amount of evidence consistent with Whorf's view. Essentially, no two people will necessarily see the "same thing" in the same way, and the wider their psycho-social divergence, the more likely it is that their conceptions and consequently their perceptions will diverge (Perception is the categorizing of sensory data according to both biological and cultural criteria that involves conceptualization.). Loftus (1979) showed conclusively that eyewitnesses typically differ in reporting an event that they have seen, so we must presume they have "somewhat different views of the world." Tannen (1990) has popularized the view that misunderstanding between men and women arises because cultural and lectal differences between the genders lead them to perceive language and behavior and events differently (see also Gray 1992). Given that there are different views of the world within a single language community, a fortiori they exist between different language communities; which brings us right back to Whorf's concern with the degree to which the structure of one's language contributes to one's view of the world.

Linguistic Relativity Since Whorf

Humboldt's comparative studies of unrelated languages led him to extend traditional ideas about language and thought to create the hypothesis that came to be known as "linguistic relativity." Whorf went beyond Boas and Sapir by demonstrating how the relationship between language and thought can be investigated. He argued that covert patterns in language are more significant than overt ones, because people are unaware of them. For Whorf, the conceptual systematization of data is what constitutes a science. What we have been calling "linguistic relativity," namely, "the study of the relation of habitual thought and behavior to language patterns studied successively and contrastingly in culturally different linguistic communities," Whorf gives as the definition of *psycholinguistics* in a 1939 letter to Leslie Spier (Lee 1996: 2). This surely shows the influence on his thinking of gestalt psychology and is

a sharp reminder that linguistic relativity is as much a topic for psycholinguistics and cognitive linguistics as for anthropological linguistics.

Leonard Bloomfield was not untouched by the linguistic relativity favored by his colleague Sapir – and their acquaintance Whorf: "[A] good deal of what passes for 'logic' or 'metaphysics' is merely an incompetent restating of the chief categories of the philosopher's language" (Bloomfield 1933: 270). Whorf was not the only person to be influenced by Sapir. Dorothy Demetracopolou Lee from Pomona College in California was obviously describing linguistic relativity when she wrote the following in "Conceptual implications of an Indian language," though she makes no reference to Sapir (or anyone else):

> It has been said that a language will delineate and limit the logical concepts of the individual who speaks it. Conversely, a language is an organ for the expression of thought, of concepts and principles of classification. True enough, the thought of the individual must run along its grooves; but these grooves, themselves, are a heritage from individuals who laid them down in an unconscious effort to express their attitude toward the world. Grammar contains in crystallized form the accumulated and accumulating experience, the Weltanschauung of a people. (Lee 1938: 89)

Her paper concludes

> Whether [the Wintu] invented or used material at hand, they have integrated a number of discrete grammatical phenomena into one consistent morphological system, to express their fundamental categories: subjectivity versus objectivity, knowledge versus belief, freedom versus natural necessity. (Lee 1938: 102)

Sadly, Whorf did not solve the problem of how to identify concepts except through language or the observed responses of individuals. For an example of the latter, MacLaury (1997) describes the investigation of color terms in Mesoamerica: a researcher took 330 randomly ordered Munsell color chips and asked a consultant to identify the best example (or focus) for each color name in their language. The consultant was next asked to place a rice grain on every chip a name could apply to; then to repeat that process over and over until it was impossible to do anymore. This results in a ranked sequence of mappings. For example, where two color names, say *R* and *Y*, are more or less co-extensive (i.e., either term is used for almost the same set of chips), mapping of *R* usually begins from focal red (because of red's primacy), and yellows will be mapped on a second, or subsequent attempt. Mapping of *Y* begins in focal yellow, and reds will be mapped in subsequent trials. This seems as objective a method as any for discovering the denotation of color terms in different communities, but it hardly reveals a world-view. And it is difficult to see how any experimental method can do more than evince fragmentary evidence for the link between language and conception. From the 1950s to the 1980s, there was a lot of rather inconclusive research within the fields of anthropological linguistics and comparative psycholinguistics into what Harry Hoijer dubbed the "Sapir-Whorf hypothesis" (Hoijer 1954). This research is critically summarized in Lucy (1992b).

Linguistic relativity has frequently been dismissed as "outlandish" (to use the term in Pinker 1994: 63). The causes were several. First, Bloomfieldian linguistics dismissed the study of meaning as unscientific, and then Chomsky steadfastly ignored it. By contrast, meaning was central for both Sapir and Whorf. Furthermore, for them, semantics is socio-cognitive – which was also unfashionable during the hegemony of autonomous syntax:

> The very essence of linguistics is the quest for meaning, and, as the science refines its procedure, it inevitably becomes, as a matter of this quest, more psychological and cultural, while retaining that almost mathematical precision of statement, which it gets from the highly systematic nature of the linguistic realm of fact. ('A linguistic consideration of thinking in primitive communities'; Whorf 1956: 79)

Second, while Lucy (1992b: 25) writes "despite his "amateur" status, Whorf's work in linguistics was and still is recognized as being of superb professional quality by linguists," there is undoubtedly a prejudice, particularly among syntactically focused theoretical linguists, against Whorf's amateur status. Third, there was Whorf's adoption by the "general semantics" movement led by Alfred Korzybski. "General semantics" has a mission to educate people against the dangers of being bamboozled by propaganda, euphemism, gobbledygook, and even ordinary everyday language. In part, the movement was a response to the affective, and all too effective, jargon of twentieth-century European totalitarianism (both fascism and communism) and of McCarthyism in the United States. "General semantics" was (and is) supposed to have therapeutic value. "In general semantics," wrote Korzybski (1958: xlvii), "we utilize what I call 'neuro-semantic relaxation,' which, as attested by physicians, usually brings about 'normal' blood pressure" – but no attestations are in fact supplied. The heir to semantics-as-therapy is Neuro-Linguistic Programming. This is not the place to discuss "general semantics" (see Allan 2006), suffice to say that, with good reason, it is not taken seriously by professional linguists. Bolinger (1980: vii) blames "general semantics" for giving rise to the jibe *That's just semantics*, in which "semantics" has the sense "pettifogging." Unfortunately, Whorf held the view that knowledge of the grammars and characteristics of other languages and their users not only leads to enlightenment but is therapeutic:

> Such understandings have even a therapeutic value. Many neuroses are simply the compulsive working over and over of word systems, from which the patient can be freed by showing him the process and the pattern. (Whorf 1956: 269 [Whorf 1942])

This could have been written by Korzybski, who was a Whorfian:

> We do not realize what tremendous power the structure of an habitual language has. It is not an exaggeration to say that it enslaves us through the mechanism of [semantic reaction] and that the structure which a language exhibits, and impresses upon us unconsciously, is *automatically projected* upon the world around us. (Korzybski 1958: 90)

The Foreword to Whorf 1956 is written by "general semantics" buff Stuart Chase (see Chase 1938, 1954). Although Whorf allegedly disavowed any connection with "general semantics," his reputation is stained by the association.

Since the 1990s, linguistic relativity has been revalued (see Cooper and Spolsky 1991; Lucy 1992a, b; Gumperz and Levinson 1996a, b; Lee 1996; Nuyts and Pederson 1997; Niemeier and Dirven 2000; Pütz and Verspoor 2000). Gestalt psychology and cultural studies are no longer rejected among professional linguists. The methods of "general semantics" may be disapproved, but therapeutic language propagandizing proceeds apace alongside dire warnings from proponents of critical discourse analysis. The intention of advertisers and propagandists of whatever cause, and also of crusaders against discriminatory language, is that by changing the language used, thinking and behavior will be changed: substitute *chairperson* for *chairman* and *police officer* for *policeman* and we recognize equal access for women and men to these jobs. There is a lot of experimental evidence that generic masculines (as in *Every schoolchild should do his homework regularly if he wants to do well in life*) do in fact favor male reference and male images over females – for both male and female language users; this bias disappears when gender-neutral terms are used. Unbiased generics also improve females' recall of texts they have read (There is an excellent comprehensive survey in Henley (1989: 65). She wrote: "*in no referential studies known to me has the masculine been found to reference females as readily as males*" [her italics].). So there is experimental evidence that language influences thinking.

From among dozens, a few recent examples of Whorfian analysis can be given. Lucy (1992a) compared countability recognition and usage in English and Yucatec using pictures and groups of objects. He found that "the pattern of mention for each group followed the general pattern of frequency for plural marking in the languages" (Lucy 1992a: 157). To oversimplify: it is obligatory to mark plurals in English, but not in Yucatec; so "English speakers were more likely to mention number (in one way or another) than were Yucatec speakers" (Lucy 1992a: 156). Consequently, "it is safe to conclude that there is good preliminary evidence that diverse language forms bear some relationship to characteristic cognitive responses in speakers" (Lucy 1992a: 148). Dan Slobin demonstrates that by the age of three or four, children are differentially influenced by the obligatory grammatical categories of their language when verbalizing events depicted in a series of pictures. "I am convinced [. . .] that the events of this little picture book are experienced differently by speakers of different languages – **in the process of making a verbalized story out of them**" (Slobin 1996: 88, his bolding) (See also Slobin (2000).):

> Our data – across a number of story episodes and languages – suggest that categories that are not grammaticized in the native language are generally ignored, whereas those that **are** grammaticized are all expressed by children as young as three. (Slobin 1996: 83)
>
> In sum, we can only talk and understand one another in terms of a particular language. The language or languages we learn in childhood are not neutral coding systems of an objective reality. Rather, each one is a subjective orientation to the world of human experience, and this orientation **affects the ways in which we think while we are speaking.** (Slobin 1996: 91 [*sic*])

Bowerman compared the acquisition of a variety of spatial configurations among Korean and English children; she concludes:

> [C]hildren are not simply mapping morphemes directly onto non-linguistic contexts of containment, support, vertical motion, and the like. From the beginning, they are paying close attention to the way adults use spatial words: across contexts the word serves as a "lure to cognition" [. . .] which draw[s] the learner's attention to properties the referents share. [. . .]
>
> [I]t is striking how quickly and easily children adopted language-specific principles of semantic categorization. There was little evidence that they had strong prelinguistic biases for classifying space differently from the way introduced by their language. (Bowerman 1996: 168, 169f)

Levinson writes of reports of spatial orientation in an Australian Aboriginal language being incommensurate with reports of spatial orientation in English:

> Instead of notions like "in front of," "behind," "to the left of," "opposite," etc., which concepts are uncoded in the language, Guugu Yimithirr speakers must specify locations as (in rough English gloss) "to the North of," "to the South of," "to the East of," etc. The system is used at every level of scale, from millimetres to miles, for there is (effectively) no other system available in the language; there is simply no analogue of the Indo-European prepositional concepts. [. . .] Thus Guugu Yimithirr speakers appear to think about space in a fundamentally different way than we do. (Levinson 1996: 180, 181)

As he elsewhere points out,

> There's no simple conversion algorithm, like 1 foot = 30 centimetres, relating [say] "left" and "north". The notion "the boy is north of the tree" crucially involves ancillary information: the bearings of the boy and the tree. In the same way, "the boy is left of the tree" encodes ancillary information missing from the cardinal-direction conceptualization of the scene – namely the viewpoint of the observer and his orientation with regard to boy and tree. From one coding of the scene, you cannot reconstruct the other. (Levinson 1997: 33)

In short, Guugu Yimithirr and English require speakers to think (i.e., (re)construct experience) in different ways. Wally Chafe was surprised when a Seneca (Northern Iroquoian) man talked about *cutting off the notches* when speaking of a serration (Chafe 2000: 114). Now, *notches* are V-shaped cuts which cannot be sawn off whereas the Seneca "translation" *o:nó?sgæ:?* (deriving from the verb "stand upright") refers to the peaks of the serrations – and peaks can be cut off. Obviously, "the same" referent is conceived differently, as one person might see a black vase on a white ground in Fig. 10.1.A and another might see two white faces on a black ground. Chafe's example is something of an echo of Whorf's contrast between English and Shawnee conceptions of cleaning a gun. Whorf (1956: 208 [Whorf 1940b]) wrote, "Languages dissect nature differently. The different isolates of meaning (thoughts) used by English and Shawnee in reporting the same experience, that of cleaning the gun by running the ramrod through it," are: the three isolates *clean with ramrod* from experience or nature used in English "I clean it (gun) with the ramrod." The three corresponding isolates used in Shawnee are *pēkw ālak h* [dry. space interior.of.hole by.motion.of.tool/instrument] to say "nipēkwālakha," meaning

"I [ni-] clean it [-a] with the ramrod." Are these differences comparable with the different aspects of the tool captured in the morphology of French *tournevis* "turn. screw," the English *screwdriver* (driving in the screw), and the German *Schraubenzieher* "screws.drawer" (unscrewing)? (The example is from Kay (1996: 97).) It is doubtful that speakers of these three languages "feel" differently about screwdrivers. This is not a systematic distinction across the three languages, but a unique instance. Other differences discussed above are systematic, categorial differences, and these are what linguistic relativity is all about.

For Sapir, Whorf, and gestalt psychologists, humans are pattern-processing beings. This is a trait taken up by the connectionists in the 1980s and then by cognitive linguistics. Cognitive linguistics holds that language is constrained and informed by the relations that (a) human beings perceive in nature – particularly in relation to themselves; (b) experience in the world they inhabit; and/or (c) conceive of in abstract and metaphysical domains. This obviously links back to the tradition of linguistic relativity, and the longer tradition hypothesizing the relations of language to thought.

Summing Up

People have speculated that language arose through emotively expressive cries, by virtue of human rationality, and from our need to interact socially and maintain advantageous social relations with our fellows. But whichever of these speculations is correct, they all required the biological development for the production of language in speech and its management in the brain (See Leakey and Lewin (1978), Kay et al. (1998), Hurford et al. (1998), Carruthers and Chamberlain (2000), Jackendoff (2002), Christiansen and Kirby (2003), Johansson (2005).). Humboldt seems to have conceived the idea that the interdependence of language and thought was affected by the cultural environment of language speakers (itself responsive to the physical environment), such that different languages reflect the different worldviews of their language communities. Whereas there is evidence that one's language necessarily influences the way entities in the physical and metaphysical world are spoken of, and this must reflect cognitive processes, it would seem that these different ways of thinking in different language communities have little effect except on the language used. In the words of Slobin (1996: 91), it "affects the ways in which we think while we are speaking" but is by no means a mental strait-jacket: the human mind can and does go anywhere.

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