



The baby, the bathwater and the “language instinct” debate

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Abstract

Reviewing the ‘language instinct’ debate, the paper identifies generativist views with the baby’s proverbial bathwater. As Sampson suggests, empirical evidence can lend no support to the claim that grammatical analysis illuminates the study of development, evolution, or the brain. Language instinct theory is coherent only if we adopt Pinker’s (dubious) hypothesis that syntax possesses ‘inner’ reality.

To argue that grammar is purely ‘cultural’ also proves unsatisfactory. In Sampson’s terms, indeed, it leads to dualism and/or a belief in a ‘haunted universe’. Thus, it implausibly suggests that neither real-time events, development, nor evolution have grammatical consequences. To avoid allowing the biological baby to disappear with the generativist bathwater, I propose we reject Pinker and Sampson’s basic shared assumption. Instead of analyzing language into form-based units, we can treat it as an aspect of social life deriving from a capacity to contextualize experience. Rather than seek evidence supporting language instinct theory, we ask how the dualism of genotype and phenotype constrains an individual’s contextualizing activity. © 2000 Published by Elsevier Science Ltd.

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Steven Pinker, *The language instinct: the new science of language and mind.* Penguin, London. Geoffrey Sampson, *Educating Eve.* Cassell, London

In *Educating Eve* (Sampson, 1997) Geoffrey Sampson seeks to demolish the theoretical edifice constructed in Steven Pinker’s (1994) *Language Instinct*. Having

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examined the grammatical basis for the claim that an instinct for language (LI) has neurophysiological reality, he utterly rejects Pinker's theory. This empirically based attack on the biological pretensions of the generativist orthodoxy challenges many unacknowledged assumptions. Indeed, Pinker's leading idea, he thinks, may be judged "almost mad" (p. 2) by dispassionate readers. However accurate the prediction, there is little doubt that many will be bemused by the echoing of distant philosophical battles. Opposition to rationalism, for example, is grist to Sampson's argument that sentence structure did not grow 'inside' the head. Denying grammar a biological basis, it seems absurd to posit that a neurophysiological state embodies an innate LI. Indeed to Sampson's mind, it is quite wrong to 'explain' grammar while trying to ignore culture. A primeval Eve (or Adam), he believes, would learn a language if — and only if — she received an education. In short, while Pinker celebrates a genetically programmed LI, Sampson denies that the entity has any 'reality'.

For the cognitive and behavioural sciences the issue is too important to be treated as an unresolved scholastic dispute. However contentious, dialogue can occur only when parties share common ground and so it is useful to place the debate in its intellectual setting. In this context, what the protagonists have in common is plain enough. In Matthews's (1993) sense, both Pinker and Sampson share the assumptions and disagreements of their post-Bloomfieldian heritage. For both a major goal of linguistics is to account, in some way, for the sets of form-based units that (they presume) constitute particular languages. Both accept that the units consist maximally in sentences constructed out of "linear configurations of morphemes" (*ibid.*, p. 3). Locked in this tradition which ignores texts — not to mention the complexities of multimodal action — neither doubts that sentences (and their components) are identical to linear, form-based units. By wrenching linguistic structure from human action, both write as if they accept Turing's (1950) conjecture that, to explain mind, thinking must be abstracted from body-based activity. Ignoring Wittgenstein's view that language emerges in the hurly-burly of human life, they take for granted that it develops as person-agents exploit a potential for making autonomous grammatical systems. While differing on their view of the agents, they have similar ideas about learning. For both, grammar develops as minds generalize from examples to construct knowledge that is later applied to perceptually 'similar' cases.

Disagreement arises — not from how sentence structure is conceived — but because of methodological choices made. Sampson, who is acutely aware of human fallibility, lays much weight on the need for generalizations to be testable and tested. Pinker, by contrast, is confident that theories using hypothetico-deductive, form-based analysis engender robust discoveries. Rather than pursue empirical issues, then, his defence of the orthodoxy is, above all, examination of 'converging evidence'. There are, of course, other differences between the scholars. If Pinker writes with the exuberance of a zealot who has achieved high rank, Sampson's iconoclastic message emerges in tones of dry, conservative dissent. In spite of their post-Bloomfieldian heritage, methodological choice, academic standing and, perhaps, political disagreement give rise to a highly illuminating

altercation. As I shall show, much can be clarified when we consider why Sampson judges Pinker’s ‘reality’ no reality at all. At very least, we see what must be abandoned to develop alternative ways of describing how children learn to talk.

Whereas Pinker’s charismatic style is designed to win converts, Sampson wishes to lead patient readers through issues central to his discipline. While making the occasional cynical aside, his unpretentious goal is to show that beliefs about LI are not based in disinterested grammatical description. Aware his style may not be sexy, he nevertheless strives to do more than disabuse the misled; thus, in the final part of his book, he spells out why knowledge of sentence structure informs his “picture of Man” (p. 14). Investigation of grammar, he thinks, need lead neither to a “Standard Social Science” view of humanity (pp. 104–106) nor the ideology that arises from positing causal models of mental processes. Indeed, his stance, Sampson believes, encourages belief in a “haunted universe” (p. 143) and “political liberalism” (p. 156).

To evaluate the LI debate, readers must decide on the extent to which their judgement will rest on other theories, aesthetics and/or relevant observations. Focusing on issues concerning sentence structure, I begin by spelling out what Pinker means when he writes of LI. Thereafter, I seek to establish whether there are falsifiable grounds for ascribing ‘reality’ to the construct. If none are found, with Sampson, I will conclude that generativism is an academic version of the tale of the “emperor’s new clothes” (p. 158). At the same time, however, I scrutinize Sampson’s view that, as sentence-structure is *not* genetically encoded, language — and creativity — lie outside the biological domain. Rather than choose between theories of generative symbolic processes and a dualist conception of mind, I show the debate can be used to overthrow the doctrines of linguistic autonomy that maintain the nature/nurture divide. In so doing, moreover, it can help transcend tired ways of thinking about human creative — and linguistic — powers.

While the *Language Instinct* lends itself to many readings, Pinker uses the book as a platform for expounding an elaborate theory. Building on Chomsky’s (1965) hypothesis that humans possess Universal Grammar, his proposals about LI represent a valiant attempt at specificity. Indeed, what is novel is Pinker’s use of functionalist philosophy and evolutionary thinking to square old generativist ideas with a picture of how genetically based knowledge of language might drive growth of grammatical “skill” (p. 18). The putative formal core of human languages — Chomsky’s “competence” (1965), “Internal Language” (1986), etc. — reappears under the guise of “Language Instinct”. In LI theory, though, the construct is both a generative system and a neurobiological trait. It is, firstly, a set of neural connections that instantiate formal elements such as “traces, cases, X bars and the other paraphernalia of syntax”, or, if not these, “something like them” (p. 124). Secondly, it is a neural means of manipulating language-forms that, in *sapiens’* evolutionary past, was selected by multiplication, variation and heredity (p. 356). Natural selection, Pinker argues, must have given rise to “stretches of DNA” that programme neurones to form networks able to “compute the solution to some grammatical problems” (p. 322).

One basic difference between this and other versions of generativist theory is that, here, there is little hedging. By adopting the view that the brain's function *is* the mind, Pinker can reconcile two models of cognition: sentence processing, he suggests, implements procedures like those familiar from digital, serial computers while — at the same time — exploiting 'output' from parallel processes of neural activity. This brain is like a futuristic laptop. Although its basic architecture consists in neural networks, the LI uses "mental algorithms", assigns "mental labels" to phrases, and enables humans to "create forms" (p. 41). More than a predisposition to learn grammar, the LI is a "database" (p. 197), a biological system embodied in neural tissue. Strikingly, LI is thinglike in its ability to interact with programs and parsers posited to 'explain' the infant's capacity to identify and record formal properties of actually encountered 'sentences'. As a physical symbol system, it is able to actively drive (sic) the growth of internal mechanisms which give rise to the "product" of the instinct (p. 26). After interacting with the world for about four years, this product — the child's (morphological and syntactic) knowledge — becomes "correct in quality" (p. 273). Her almost perfect language ability has matured into "a complex specialised skill" (p. 18) that functions "to shape brain events with exquisite precision" (p. 1). So important is brain-event mapping that, on page one, Pinker informs us that his words will "cause" readers "to think some very specific thoughts".

While the theory has been developed elsewhere (especially, Pinker and Bloom, 1990), in this context, it is carefully located in generativist tradition. Since everything follows from a method that defines 'languages' by descriptions paired with sets of 'sentences', Chomsky is credited with the "unmasking" of LI (p. 21). Further, since formal descriptions are believed to identify neurophysiological 'realities' (see below), it is taken for granted that LI theory and the writing of grammars can complement each other. In ebullient mood, Pinker cockily proclaims science has "begun to crack the beautifully designed code that our brains use" (p. 124). His rhetoric suggests revolutionary findings that derive from paradigm-guided deductions have unmasked languages-in-the-brain. The state of the art, he suggests, is his elegant theory.

It is not easy to subject LI theory to falsification. Indeed, sceptical readers who get past the opening of Pinker's book will be frustrated by how often the argument assumes precisely what they do *not* take for granted. Logically, however, the circularity is inevitable. Pinker is obliged to assume LI has formal properties: nothing else could provide a basis for the rhetoric and reading that justifies the theory. Given the long hegemony of generativism, Pinker unhesitatingly accepts the 'reality' of syntax-in-the-mind. For the same reason, Sampson's attack must undermine the theory's grammatical foundations.

Remaining true to Popper's vision, *Educating Eve* builds on the sceptical reader's misgivings. Sampson asks us not to be dazzled by Pinker's "verbal pyrotechnics" (p. 13) but, rather, to weigh his claims against the consensus that has arisen in the grammatical tradition. From this perspective, what must be evaluated, plainly enough, is belief in a determinate — and neurophysiologically

embodied — system of language knowledge that can be identified by *a specific formal model*. Until claims about X bars, traces, cases and other formal paraphernalia are evaluated against attested constructions, the LI, like ‘competence’ and its other predecessors, must remain purely hypothetical. Accordingly, Sampson takes a historical perspective and examines previous challenges to these constructs by considering how observations bear on claims for language learning, species specificity, sentence structure and non-linguistic parallels. While similar points have been made by, for example, Linell (1979), Matthews (1979), Moore and Carling (1982), and Sampson (1980) those new to the issues are thus alerted to well-known problems with generativism. Later, discussing recent views, Sampson considers Bickerton’s (1990) discontinuity arguments, Jackendoff’s (1990) view of universals, and how Pinker ties these ideas to evolution, the ‘SLI’ syndrome, and the alleged reality of *mentalese*.

Given Sampson’s extensive knowledge of the grammatical foundations of LI theory, it is highly appropriate to focus on sentence-structure. However, he can also be criticized because his approach skews the argument in the philosophical direction whence it came. Failing to confront, for example, Pinker’s belief that mind and brain are a single information-processing system, or his teleological picture of evolution, he can be read as having “missed the point” (Murphy, 1998). Since many readers will be interested in cognitive and biological questions, what follows brings converging evidence into account before examining the interdependence of LI and its sister theory of language universals. Then, shifting the focus to how sentence-structure bears on creativity, and learning, I suggest that, if we drop Sampson and Pinker’s assumptions about linguistic autonomy, more plausible approaches to behavioural, cognitive and evolutionary aspects of language can be developed.

Like all post-Bloomfieldians, Pinker eschews using ‘language’ to refer to what people actually do when they interact by talk, sign and written symbols. With Bloomfield and his successors, he applies the term to form-based concepts and constructions. Further, with the Chomsky of *Aspects* (1965) and beyond, he theorizes language activity as correlated with the internal manipulation of ‘real’ formal objects. If such a theory is to unmask truths of human nature, its postulated constructs must be ascribed general properties that are, somehow, observable. Generativists have sought to solve the problem in two main ways. Firstly, using ‘deviant’ sentence constructions, they generalize about grammatical norms and processes. Secondly, they adduce arguments about how, in principle, formal entities *could* explain thinking, grammatical development and, in LI theory, language evolution. From a biological or cognitive position, however, the methods seem flawed because, just as Skinner (1957) overextended ‘stimulus’, these apparently overstretch ‘linguistic form’. Further, since non-formal aspects of language activity are ignored, the approach precludes drawing systematic distinctions between effects due to proximate and ultimate causes.

A celebrated case of deviance is that of Genie, whose name is often invoked to illustrate the critical period for language learning. In championing the LI, though,

Pinker recognizes her misfortunes are too non-specific to serve his theory. Accordingly, he focuses on a family who seemingly provide empirical evidence that, in principle, grammatical development is driven by genetic factors. Using Gopnik's (see Gopnik, 1990; Gopnik and Crago, 1991) work, he discusses a transgenerational family of "language mutants" (p. 432), people diagnosed as having a 'specific language impairment'. The linguistic powers of these sad individuals are then contrasted with those of family members who are linguistically 'normal'. The so-called mutants lack control of basic grammar and cannot, for example, do the 'wug test'. In Pinker's theory this shows that, for heritable reasons, they lack 'rules' needed to generate (and speak) the plural forms of English nouns. Allegedly, this shows genetic disorders influence the growth of capacities narrowly dedicated to fine aspects of sentence-structure.

Sampson's re-reading of the literature challenges Pinker's theory-based description. In fact, to his mind, Pinker's views do little more than echo an inbuilt generativist bias. Overlooking the challenge to Gopnik's claims (see, Vargha-Khadem and Passingham, 1990; Vargha-Khadem et al., 1995), Pinker fails to mention that the individuals who battle with the wug test are mentally subnormal. Indeed, contrary to diagnosis, their impairment — like Genie's — is anything but language-specific. The dispassionate observer can draw only the weak conclusion that genetic factors 'influence' language development. For Sampson, moreover, failure to recognize the generality of this impairment shows that caution must be used in using linguistic theories to interpret clinical cases (and vice versa). Given our current knowledge of mind and brain, clinical observations raise issues too complex to be used for testing technical hypotheses. By way of comparison we can consider cases like those reported by Oliver Sacks. In *The president's speech* (Sacks, 1985), for example, aphasics are observed splitting their sides with laughter during a speech by a serious, and deliberately sincere US president. Sacks suggests that this 'deviant' behaviour occurred because they oriented to Ronald Reagan's peculiar — and masterful — control of facial expression, gesture and prosody. Kinesic aspects of talk influence their understanding and, for this reason, must be affected by neurobiological activity. What, though, does this mean for non-aphasics? Does 'normal' behaviour depend on an 'internal system' that blocks recognition of how actors (and politicians) control our reactions? Surely not. Such a claim would replicate the error of testing a technical hypothesis against broad clinical evidence.

Other alleged converging evidence for the LI concerns the putative existence of an internal language (cf. Fodor, 1975) that has been called 'mentalese'. However, as Sampson suggests, this argument is unsuitable for defending the LI hypothesis. In the first place, this is because mentalese was posited within a framework taking the 'reality' of internal grammars for granted. Secondly, even in principle, the only observations that *can* count as evidence for mentalese are precisely those used to support belief in LI. If it is legitimate to hypothesize brain-languages at all, this depends on assuming that talk in, say, isiZulu re-presents the output of underlying (not isiZulu) language-systems. To use one brain-language to argue for another is

obscure, unfalsifiable and, most likely, wrong.¹ Saying that the mentalese hypothesis supports LI theory is to confuse a conclusion with an assumption. Further, as Sampson stresses, those with faith in mentalese, have no need for empirical justification. For the sceptic, to say mentalese implies the ‘reality’ of LI is like to saying that, *because* angels exist, miracles happen.

Pinker’s general evolutionary arguments run into a difficulty quite unlike that faced by his mentalese proposal. For all but religious fundamentalists they reflect, not circularity, but almost tautological failure to touch on live issues. Rather, they conform to the broad (Western) consensus that we — and our behaviour — have evolved thanks to the power of natural and sexual selection. Indeed, a major merit of Pinker’s book lies in the reasons he presents for acknowledging that language behaviour emerges from our biological patrimony. His objective, however, is different. To reiterate, he aims to show that we possess a database embodying knowledge of X bar syntax, traces, cases and associated paraphernalia. As with mentalese, we cannot test his proposals about how — in principle — the LI database might have evolved.

Evolutionary processes could have given rise to LI only if its representations were ‘really’ embodied in the brain. However, the very idea seems muddled. At very least, it invites a sceptic to pose the queer question of how, say, an N bar could count as such — not for a grammarian — but for a brain? Secondly, if this difficulty can be overcome, there remains a need to explain the selection of formal brain representations. In grappling with related issues, Pinker becomes so involved with questions of principle and metaphors of design that he overlooks more basic questions. Above all, he fails to explain why networks that represent formal categories might arise through natural selection. While discussion of the genotype is informative, he plays down the — undisputed — finding that evolution works by selecting heritable variations. In Mayr’s (1988a) terms, he overlooks the organism’s “genotype-phenotype duality” and tends to treat natural selection as if it were goal driven. As noted, LI purports to explain, for example, emergence of a neural networks that compute the solution to certain “grammatical problems”. In other words, networks have some way of recognizing a problem *as* a problem before any evolutionary solution arises. But this cannot be right. Although eyes look as if they had been designed, this is not so: eyes have evolved — many times — because, in certain populations, individuals who see better produce more, successful offspring (e.g. Dawkins, 1986). Eyes evolve not to solve problems but because, in some cases, more seeing correlates with the replication of more ‘eye’ genes. Unless Pinker explains why grammatical ‘solutions’ (to what *he* sees as problems) affect reproductive success, he commits Mayr’s (1988b) “teleological fallacy”. What stands in need of explanation is why, for example, reproductive benefits accrued to individuals who, for example, drop (or insert) subject pronouns. Unless this is provided, it

¹ As is well known, Wittgenstein (1958) argues any such internal language is a logical impossibility.

remains, *prima facie*, much more likely that talking co-evolved with the neurophysiological mechanisms and cognitive skills typical of primate social behaviour (e.g. Humphry, 1976; Byrne and Whiten, 1988; Goody, 1995; Gibson and Ingold, 1993; Dunbar, 1996; Deacon, 1997).

Sampson identifies other weaknesses in general arguments for LI theory and its counterparts. He notes, for example, that Jackendoff's (1990) exploration of signing leads to contradiction. Suggesting we have innate propensities to develop the grammars of sign languages, Jackendoff stresses their medium-specificity. However, as Sampson sees, this contradicts the dubious assumption that, since thinking is computation, it is independent of bodies (the 'physical medium'). Related mismatches arise in Bickerton's (1990) arguments about discontinuity. Although protolanguage is deemed extinct, it is assumed to be *qualitatively* different from language. Rather than observe primitive language-behaviour, Bickerton argues by analogy with pidgins and speech by small children. The parallels, however, may be misleading. Sampson suggests that, unwarily, Bickerton puts his finger on why pidgins differ from proto-language. Precisely because, like language, proto-communication must have served thinking purposes, we should expect it to become more structured than the rough-hewn pidgins used to communicate between strangers. With regards to child-speech, Sampson suggests that the 'leap' from non-language to language can be plausibly explained by the child's using guess and test techniques to re-invent what it hears for talking and thinking purposes. While Skinner would oppose this idea, the explanation is certainly possible.

Converging evidence assembled to demonstrate the 'reality' of LI provides no support for Pinker's theory. Deviant linguistic behaviour, claims about discontinuity, mentalese, natural selection, as well as observations of vocal and visible 'speech', pidgins, and child language provide no reason to hypothesize that neural networks embody special, language-specific algorithm-like forms. Indeed, a neutral observer will surely conclude that, as yet, there is no reason for believing in any neural system underpinning growth of language-specific knowledge of sentence-structure. Nothing has any bearing on the existence (or otherwise) of a database of X bars, traces and other formal paraphernalia. On the other hand, the discussion does clearly speak for the general (and, perhaps, uncontroversial) idea that talking is biologically constrained. While lacking reason to ascribe 'reality' to LI, sceptics will concede that language development is influenced by genetics and inseparable from both brain and activity. Indeed, much of Pinker's converging evidence can be reinterpreted as showing language is *not* form-based, representational, medium independent, or reducible to input/output to/from a quasi-linguistic system (mentalese). Language may be integrated with other behaviour in ways that no post-Bloomfieldian has ever imagined.

Sampson emphasizes that the generativist case developed in opposition to Skinnerian models of learning. Historically, Pinker's position is consonant with general recognition that languages emerge as infants develop their own ways of

understanding. Reacting against crude behaviourism, there is now consensus that intellectual skills and abilities, as Bidell and Fischer (1997) put it are, “products of...self-governed activity in relation to the world”. Developmental psychologists agree that infants are individuals who, together with environments including significant others, discover ways of assessing and managing their social worlds. In so doing, moreover, most concur that they develop cognitive functions that enable them to adapt by presenting themselves to the world while, simultaneously, learning to represent the world perceived. Given this consensus and his conservative stance, Sampson takes pains to stress he too believes children use examples to generalize and, on the basis of experience, to test their generalizations.

Surrounded as he is by generativist thinking, Pinker fails to recognize how radically views of child development have changed. For example, he provides no argument to support belief that children are bound to *deduce* knowledge of sentence-structure (p. 73). Indeed, he fails even to ask, firstly, why this should derive from logical — rather than practical — processes and, secondly, why their putative generalizations should depend on formal knowledge of X bars, traces, cases and other paraphernalia. Instead, Pinker continues the forty-year war against Skinner’s theory of learning. It seems as if he believes that radical, nativist theory is the only alternative to behaviourism, that the work of Vygotsky, Piaget, Stern, Trevarthen, Bruner, Wertsch, Cole and Nelson — to name a few — lends little to understanding language development. This blinkered attitude can only be explained by what Sampson terms Pinker’s dependence on “counterfactual idealizations” (p. 51). As originally noted by Matthews (1967), after *Aspects*, generativist models came to rest on an unjustified and, perhaps, unjustifiable conflation of generative grammars with what a child allegedly knows (see, Matthews, 1993, pp. 211–214). Without discussion, Pinker asks readers to accept that what grows in a child’s brain — the “product” of the instinct — is *formally identical* to a generative grammar. The sceptic wonders: “What reason have we to believe that the brain of a four-year-old embodies a formally specified grammar?”

Sampson agrees it is dangerous to assume grammatical description identifies forms possessed of neurophysiological ‘reality’. However, his conservative criticism is less radical than that of Matthews because he shares Pinker’s post-Bloomfieldian allegiance. He objects to the conflation of grammatical description and neurophysiological reality, in the first place, because he believes it is false that four-year-olds have a near-perfect state of grammatical knowledge. Secondly, this counterfactual claim, as he notes, gives rise to the far-fetched idealization that alienates generativism from developmental psychology. Assuming both that a new-born infant possesses LI and a four-year-old has an almost perfect “product” of the instinct, Pinker follows Chomsky (1976) by treating language development as if it was instantaneous. This too is counterfactual. Obviously, enough children *differ* in their paths to mastery of sentence-structure (e.g. Nelson, 1996). Remarkably, moreover, nothing in

Pinker's book anticipates the objection that we lack grounds for believing a grammar replicates a "system" embodied in a maturing brain.²

The generativist reply to scepticism of this kind has remained unchanged in thirty years. If not ignored, it is addressed by invoking arguments from incredulity. Echoing Chomsky, Pinker thus ridicules the crude behaviourist position to insinuate that *only* generative idealizations can explain commonplaces of language development. After years of debate, however, these truisms are anything but self-evident. Irritated with having to face this issue once again, Sampson dismisses the assertions rather roughly. Firstly, unless some kind of comparison is made, claims about the 'speed of acquisition' are vacuous. Secondly, while there may be a 'critical period' for language acquisition, this seems to apply *grosso modo* to much learning. Thirdly, the 'data' which the child encounters are richer than Chomsky imagines (and the child's language-constructing more sophisticated). Fourthly, while infants indeed identify strange and complex constructions, these provide evidence, not for a 'developmental sequence', but that learning (some) grammar can be difficult. Fifthly, much of the research is sloppy: Pinker trots out examples that, in spite of mistakes, have been repeated time and time again and uses others that are quickly refuted by examining computer corpora.³ Generativists, he suggests, are so concerned with justifying theories that they often skim over what uncritical readers mistake for matters of detail.

Were there empirical grounds for positing the (extra-theoretical) 'reality' of the LI, failure to square up what is known about learning with generative grammar would matter little. How, though, could such grounds be established? Once, this was recognized as a crucial issue for grammatical theory. Indeed, following Harris (1951), the younger Chomsky (1957) saw his "fundamental concern" as that of solving the problem of "the justification of grammars" (p. 13). It is, therefore, disappointing that Pinker gives no space to spelling out why — to his mind — the LI is a theoretically 'justified' construct.

For generativists since the 70 s, only one technique has mattered in evaluating grammatical models. Gone are the distributionalist methods Chomsky borrowed from Harris as indeed are their 1960s equivalents that relied on judgements ('intuitions') of what people say. These had to be swept away because, after the collapse of "grammaticality" (see, Matthews, 1993, p. 232), only "explanatory adequacy" (Chomsky, 1965, 34) remained as a criterion for evaluating grammars.

² Rather what we meet is an idea that, as no finite stage grammar generates an infinite set of sentences, a generative grammar is required. This is legitimate if — and only if — we accept the assumption that grammars and languages are to be described by formulae that define 'possible' sets of sentences (viz. linear configurations of morphemes).

³ For example, Sampson discusses the claim that there is a constraint that makes a full or reduced clause modifying a noun into an island (p. 127); this, he suggests, was shown not to hold for many examples by Bolinger in 1972; Or Pinker claims (p. 109) that, in English, the arguments of a verb must occur closer to the verb than its adjuncts. This, Sampson found (p. 133), was refuted by the second sentence of the Brown corpus of American English (and frequently thereafter).

Effectively, these criteria tested the closeness of fit between (generative) grammars and (generative) theories of language acquisition and universals (see, Matthews, 1993, p. 216). Indeed, so influential was this theoretical move that Pinker does little more than assert that universals are ‘discovered’ with techniques of formal analysis. Before seeing how this widespread view can be challenged, it is useful to grasp why Pinker’s theory requires him to posit a symbiotic link between LI and universals.

Given his causal model of communication which asserts that language has the ability to make brains shape specific thoughts and, given his assumptions about mentalese, Pinker has no alternative to accepting a theory of universals. How else, he might think, could propositions conjured up in a language-of-thought, ever come to be framed in words? How else could we cause one another to think specific thoughts? From Pinker’s perspective, then, the challenge is to explain how a given set of syntactic universals can illuminate LI theory (and vice versa). Moreover, because he assumes language growth can be theorized as instantaneous, he needs to accommodate this assumption with constructs that allegedly explain how a child’s knowledge grows from what is embodied by the mature state of the LI. Humans must, therefore, be treated as possessing, among other devices, a “parser” that analyses data needed to construct language-specific “codes” (pp. 197 ff.). Without it, Pinker might say, there would be no product of the instinct. Four-year-olds who lacked parsing devices could never deduce the language-knowledge manifest as grammatical skill.

Pinker constructs his most explicit argument for linking LI and universals around the causal theory of communication (for criticism, see Reddy, 1979; Harris, 1981; Levinson, 1995). Phrase structure, he suggests, is “an engineering solution to linking the interconnecting web of thoughts with what the mouth can utter” (p. 101). The resulting skill enables us to group words into phrases so that, he says, we “connect them with their proper meanings” (p. 101). In humans (over 4 years old) the process guarantees utterance-expressions connect with the right “chunks of mentalese” (p. 101). This embodied connection, of course, underpins the alleged ability to shape brain-events. However, since linkage also depends on particular languages (e.g. isiZulu), interpretation ‘must be’ mediated by an intervening construct. To explain the interfacing of language-specific expressions and mentalese propositions, therefore, it is necessary to posit yet another ‘system’. This, of course, is LI. Moreover, the link between putative universals and LI must hold for all languages. Given its evolutionary pretensions, differences in utterance-expressions need to be filtered out by an LI sufficiently abstract to map expressions in any language onto the brain-language of mentalese. How abstract is this? The solution is elegance itself. The LI, it follows, is in symbiosis with the universals: not only does it drive the learning of grammar, but it also identifies a set of formal constructs that generate a larger set of finite forms whose members constitute the set of sets that describes sentence-structure in all possible languages. In its guise as a universal set of possible sentence-forms, it actively defines the parameters and settings that constrain all possible variation in human sentence-structure.

While the theory has what Matthews might call a ‘classical simplicity’, it rests on unfalsifiable foundations. Not only does it assume the causal nature of linguistic communication, the existence of mentalese, and the correctness of generativist analyses, but it also implies that formal analysis can identify the content of the LI database only by judging how natives speak and/or intuit word-based constructions.⁴ In short, it begs the questions it sets out to solve. After all, why should we prefer one form-based analysis to another? Why should we use form-based analysis at all? Pinker entirely fails to address these questions and, rather, focuses on examples that allegedly justify his assumption that form-based entities ‘underlie’ speaking and hearing. In so doing, he carefully focuses on usage and — despite universal claims — limits his concerns mainly to English. For all his caution, however, he tends to overgeneralize. To distinguish a headless word from its headed counterpart, we read, we need only test if “The head of a word is simply its rightmost morpheme” (p. 130). Not only is this disappointingly language-specific but, even for English, the definition is patently circular. Similarly, while there may be good reasons for distinguishing inflexional and derivational morphology in English, the distinction does not apply to all languages (e.g. Matthews, 1991). Or, to cite one more example, much rests on the claim that, in all communities, babies “intuit the correct meaning of a word” (p. 153). While this *may* be true, these general claims only pertain to the putative product of the LI (not the LI itself). Further, unless Pinker can demonstrate — rather than assert — that analyses of expressions ‘capture’ universals, the sceptic will not concede that they are independent of the notation adopted. By failing to provide independent justification for adopting of X bar theory, Pinker gives no grounds for assuming that the universals posited have extra-theoretical reality.

From a generativist point of view, such criticism will appear to confuse cause and effect. Indeed, for the orthodox, the theory has *already* unmasked the real existence of universals. Accordingly, there is no need to justify what may be implied in the choice of an X bar theoretical model. For the generativist, the boot is on the other foot. What leads to a more positive evaluation of X bar theory — relative to, say, the grammar of *Aspects* — is what it ‘predicts’ about universals (This is the significance of Pinker’s claim that the LI consists in X bars traces, cases, “or something similar”.) Indeed, as in other areas, radical critics conclude that debate has run into a dead end (Matthews, 1993, pp. 249 ff.). Unrecalcitrant post-Bloomfieldian that he is, Sampson’s reaction is more dogged. Adopting the purist position that, to justify generativist theory, universals must be truly universal (viz. apply to all languages), he uses his extensive knowledge of grammar to examine every example he can identify in the literature. Painstakingly, for each

⁴ This conclusion evokes notorious problem. While Pinker (unlike Chomsky) overcomes ontological difficulties by assuming that grammar is the brain’s function, he has no account for how the output of grammar interfaces other factors. If conversation, out of context, “is virtually opaque” (p. 224), why should observations of speech or tests about ‘intuitions’ have any bearing on LI theory?

one of these, he shows either that it is flawed or limited in scope.⁵ While, for Pinker, a focus on forms is what has led to discovery of universals, Sampson believes that investigation of linguistic differences has become confused with study of X bar notation.

On the issue of universals no compromise is possible. Non-believers in Pinker's LI will marvel at the anthropomorphic ways of speaking that typify syntactic descriptions (cf. Pullum, 1996). In Pinker's theory, for example, the verb grows into a "little despot" that can "dictate" how slots allocated by "super rules" are "to be filled" (p. 113). Or, elsewhere, components "interact" to "determine the meaning of a sentence in chains of deduction as intricate and precise as the workings of a fine Swiss watch" (p. 124). For Pinker, it is obvious that verbs dictate and components deduce. Since the X bar model was designed to fit a theory that hypothesized language skills derive from a universal basis, it is necessary to assume that the formal entities of LI drive the growth of linguistic skills. The theory requires a system — not a child — to be the *active* maker of forms. Further, to ensure the vision's scientific status it need only be affirmed that, in principle, this is performed deductively (in accordance with the principles of a Universal Turing machine). Although adopted without comment, the idea will be uncontroversial for those who still accept that what occurs in brains (and machines) is best conceptualized in terms of effective procedures. In spite of its ingenuity, however, no theory-independent evidence supports the neurophysiological reality of sentence-structure universals.

Rather than question whether languages should indeed be identified with linear configurations of forms, Sampson builds on ideas put forward in *Making Sense* (1980). Having countered the proposals for universals one by one, he attacks Pinker where the latter may think his theory impregnable. Using a generativist insight, he does his best to bury the LI hypothesis by claiming not only that there is *one* genuine language universal but also that only Chomsky had the brilliance to see that it could not be explained by logical necessity. Universally, Sampson concedes, sentences have hierarchical structure. Although, in principle, grammar could be different, this bucks the trend towards linguistic diversity. Before returning to this issue, however, it is of interest to consider why post-Bloomfieldian ideas generated interest in 'universals' of syntactic structure.

The topic of universals, Matthews points out, is a logical flowering of theory that privileges 'form' above meaning (1993, p. 35). Given the failure to acknowledge — let alone challenge — the root assumptions of generativist theory, their reification is predictable. When all languages are described in relation a fixed set of forms, it will seem 'natural' to ask whether the resulting patterns have any (extra-theoretical) basis. Indeed, as he documents, the question was raised by

⁵ As Matthews points out, from a generative perspective, this is open to ridicule. In 1980s terms, any putative universal that turns out not to be a true universal can be dismissed as representing a new option on a parameter. For Sampson, however, this matters not: his culture-first argument requires him only to show there are no universal universals.

many in the period before the writing of *Aspects*. Further, as noted, Chomsky himself was acutely aware of the problem of justifying grammars. Thus, when generativism gained hegemony, rather than let the problem slip away, Chomsky provided an ingenious — but empirically ungrounded — answer. Grammars could be justified, he suggested, if their statements could be mapped on to similarly formulated hypotheses about universal grammar. This idea is the basis for the bold move made in *Aspects* whereby, first, he identifies a child's putative grammar with a generative analysis of a language and, second, he claims linguistic theory can be validated by the extent to which it justifies this putative achievement. For Matthews, this attempt to solve the problem of justifying grammars is a "reification on two levels" (1993, p. 212). Strikingly, Pinker evokes the same double reification by defining the object of his theory — the language instinct — in relation to its putative "product". Just as for mentalese, both hypothetical systems are posited on the basis of describing the same constructions. For a dispassionate observer, therefore, neither can be used in evaluating the other. For Pinker, this 'method' has led to progress in cracking "the code our brains use" (p. 124). And, for the radical sceptic, the moves are ingenious solutions to methodological problems latent in post-Bloomfieldian theory. From any perspective, though, the reifications explain the adjustments in notation and terminology characterizing thirty years of full-blown generativism.

Pinker assumes that the theory of universals has solved the problem of justifying grammars. Thus, apart from *pro-forma* arguments against finite state grammars (cf. Chomsky, 1957, 1965), no attempt is made to explain his conviction that the study of language is primarily a matter of investigating formal expressions. Further, he ignores the (apparent) indeterminacy of languages. Yet, Chomsky (1957) is surely correct in his view that, unless a language can be defined as a possible set of formal expressions, no one *kind* of grammar (viz. one that identifies the set) can be better than another. Without a concept of grammaticality, formal descriptions can only be justified *a posteriori*. While Pinker might accept this reasoning, he continues to regard theories of universals and language acquisition as *a priori* criteria that permit the evaluation of grammars. This leads to circularity. Not only are good grammars defined as those which — according to current theory — identify what may have developed in the mind of a child, but good theories of language acquisition begin with a theory of language universals. And where do good theories of language universals come from? Why, good grammars, of course.

As noted, on the matter of universals no compromise is possible. The sceptic denies the *a priori* nature of the truths posited in theories of language acquisition and universals. After all, the history of generativist linguistics shows that these theories developed after generative grammar. Used to limit debate by means of counterfactual idealizations, they are, very literally, *a posteriori* constructs. For conservative and radical sceptics alike, generativist theory, and LI, are a magnificent house of cards.

Perhaps these are minor difficulties. After all, do not all first-year students of linguistics learn that, in every language of the world, sentences can be analyzed

into constituents? To my mind, therefore, the main achievement of Sampson's book is to show that even this universal is overwhelmingly likely to have a basis in culture. Rather than trace constituent structure to post-Bloomfieldian assumptions, Sampson accepts these as a basis for identifying facts. However, unlike Pinker, he has no interest in 'explanatory' theory. Instead, he builds on Simon's (1962) work to establish a theory-independent reason to account for the hierarchical structuring of sentences.⁶ This, he suggests, is part of our second nature because any complex organization that develops over long periods of time will — in all probability — take this form. For mathematical reasons, it is massively more likely that organisms, sentences, clocks, organs, or empires develop (what we see as) hierarchical structure. Further, elaborating on the idea, he notes that the structures emerge out of two kinds of process. In nature, they most often arise endogenously as one unit splits from another and, over time, their successors become adapted to particular functions. Thus, new versions of the units are rightly described as filling different places in a hierarchy. On other occasions, however, hierarchies form symbiotically as one unit unites with another so that, in a new environment, viable superunits are formed (having potential to fuse with others). Constituent structure, Sampson suggests, shows signs of being just such a symbiotically produced hierarchy.

What difficulty can there be in regarding sentences — not as mental products — but as external, culturally defined units? Sampson anticipates the generativist objection. Were all learning indeed deductive, this would be impossible. A child that performed as a pure deductive reasoner, like one that learned only by responding to stimuli, would never learn an externally constrained grammar. Indeed, in this respect, Sampson's position might seem to fall into the same error as Skinner's learning theory (Chomsky, 1959). To ensure this does not happen, Sampson strikes out a direction that is diametrically opposed to Chomsky's. Rather than posit that mind is computational, he observes that we find it hard to be logical. Unlike computers, he suggests, we manage to learn grammar because we — but not they — are genuinely creative. Once children have reinvented the proposition, social interaction, education — and human intelligence — can do the rest. To get what we want and to represent the world as it seems to others, we need language-specific ways of knowing. This, Sampson thinks, ensures natural curiosity can develop into grammatical inventiveness. However the argument strikes the reader, it raises questions that deserve answers.

For dissenters, the external view of grammar has appeal. Not only does Sampson reassert an empirical approach to studying the development of form-based expressions but he does so without surrendering a central Chomskyan insight. *Contra* Skinner, Sampson presents individuals as contributing, crucially, to the emergence of hierarchical structure. Indeed, in spite of his traditional stance,

⁶ Intriguingly, in *How the mind works* (Pinker, 1997), Pinker independently adopts Simon's argument to argue — not for the cultural reality of grammar — but the modular organization of brain (and other complex systems).

Sampson appears close to rejecting the individual-centred view of ‘learning’ taken by empiricist thinkers. However, perhaps because of faith in human creativity, he does not ask how machines could simulate the emergence of grammar, or how primate interactions might have come to be mediated by structured vocalizations. Yet, since ideas about external structure are testable, Sampson’s insight can shape investigation in human behavioural ecology. It could, for example, be used to evaluate Wray’s (1998) idea that, in phylogenesis, meaningful, formal patterning — primitive social formulae — predated the development of words.

Approached from both radical and conservative perspectives, Pinker’s LI hypothesis fails to address what might have been its central themes. Firstly, on the radical view, he fails to explain why languages should be defined by grammars and why these should analyze linguistic expressions as linear configurations of morphemes. Secondly, for both sets of critics, Pinker overlooks what Chomsky had seen forty years before. His book is flawed by failure to discuss why some theories of language (or, grammar) are ‘better’ than others. Instead, for the conservative sceptic, he bases his work on counterfactual idealization. Unless taking generativist ideas on faith, we must follow Sampson in rejecting the following:

1. that generative grammars are inherently ‘better’ than other linguistic descriptions;
2. that X bars, traces, etc. are genetically encoded forms without which the instinct would have no “product”.
3. formal linguistic universals (except, perhaps, constituent structure);
4. that grammatical analysis illuminates the evolution of mind and brain.

The dispassionate reader must remain unpersuaded by LI theory. Noting that Pinker has failed to acknowledge the roots of his theory, she may also wish to challenge post-Bloomfieldian assumptions. In this case, she will regard LI as a reification and judge the generativists to have repeated Skinner’s confusion between a method and an object of enquiry. Before developing this radical critique, however, it is of interest to explore consequences of the conservative view. For, as Sampson sneeringly suggests, as post-Bloomfieldian grammars are merely written descriptions of historically and culturally specific ‘linguistic forms’, their significance for the study of behaviour, mind and brain is much exaggerated.

Sampson’s position is as open to scepticism as his rival’s. His distinctly unfashionable view is grounded, in part, on his awareness of our fallibility and, in part, on his philosophical commitment. Having argued that the hierarchical organization of grammar has emerged in the process of cultural development, he is bound to suggest that — thanks to its inherent creativity — the human mind is unknowable. To understand this conclusion, we must consider what separates Sampson and Pinker’s approaches to learning. Whereas, Pinker assumes all learning is deductively driven (and can be modelled by standard computational techniques), Sampson believes we — but not machines — are ‘creative’. How can this be explained? Too philosophically sophisticated to attribute his ideas to converging evidence, he honestly and modestly traces their pedigree to readings of,

especially, Popper, Bergson and Locke. Learning is to be explained, he suggests, by an ability to generalize that is *not* deductive: we make guesses which, sometimes, turn out to be correct. Creativity, Sampson believes, transcends logical enquiry and is too human to be approached with the methodologies of science.

Without faith in genuine creativity, Sampson might be less outspoken in calling for linguists to abandon all claim to supply knowledge about species-specific, mental structures. For, as he acknowledges, there are few jobs in declaring mind beyond the reach of theory (161). Making the best of what can be seen as a negative — and politically incorrect — stance (see, e.g. Murphy, 1998), Sampson builds his critique to present what he sees as a positive vision of the world. With relish, he notes that his suggestions are more out of step with modish, post-modern discourse than the LI he has destroyed. Then, with disarming honesty, he draws conclusions from his faith in creative generalization. Readers are invited to adopt a haunted-universe position in which they abandon the idea that the mental is reducible to matter (p. 139). Just as evolution (apparently) allows for genuine emergence, human minds, he suggests, can be a source of entirely new thoughts. Since the growth of knowledge depends, above all, on induction, it is correct that children are ‘born knowing nothing at all’. Curiosity — not knowledge — is manifest in infant predispositions for acting and behaviour that, eventually, lead to re-invention of propositions. Of course, once achieved, education is crucial in ensuring that children learn how to test propositions against phenomena and, thereafter, to construct general knowledge of (what is perceived to be) ‘the world’.

Let us now use Sampson’s judgement that LI has no ‘reality’ to go beyond scepticism without stumbling back into dualism. Of course, if we value grammatical facts above theory-building, Sampson’s argument holds. No empirical grounds justify the hypothesis that we embody genetically encoded X bars, traces, cases and other formal paraphernalia. In spite of its stunning elegance, LI theory derives from post-Bloomfieldian doctrines and the reification at two levels that enabled Chomsky to transmute this tradition.

Rejecting Pinker’s theoretical edifice strikes a chord with grammarians as well as those focused on language-behaviour. Interest in the ecology and development of language meshes with grammar because, in the first place, generativist theories say little about community speech-patterns (‘E language’). Secondly, such theories impose a strange barrier between word-based units (‘language’) and talk (as well as other ‘discourse’). Thirdly, prioritizing form over meaning forces theorists to take sides in the nature/nurture debate. Indeed, the LI debate shows that if sentences are linear configurations of morphemes, a theoretical distinction must separate ‘external’ from ‘internal’ aspects of language.

It may be that grammars have to be devised under the principle that languages are determinate. However, if explanatory goals are sought, presupposing linguistic autonomy can only transform grammar-writing into theoretical practice. As we have seen, in expressing preferences for converging theories or reliable descriptions, scholars become separated by an ontological divide. Formal approaches make it likely that we separate linguistic mind from human bodies; empirical methods increase the probability that we see linguistic form as

irreducible to cognition. These outcomes can be avoided only by abandoning belief in autonomy.

In post-Bloomfieldian terms, linguistic autonomy is condensed as a doctrine that languages are determinate sets of forms.⁷ To avoid dualism, it thus becomes necessary to ensure languages are *not* reduced to form-based units (e.g. sentences). Of course, if unbounded, no *a priori* reason justifies analyzing languages as sets of formal (or functional) systems. Stepping into the unknown, then, the radical avoids negative conclusions and unjustified theories by surrendering ideas like the following:

1. form can be studied before meaning;
2. function (or meaning) is a property of an utterance;
3. a language is a determinate form-based entity;
4. language is centred on an individual's mind;
5. language can be abstracted from human bodily action;
6. on occasion, we make each other think specific thoughts;
7. it is possible to distinguish thinking from concurrent activity;
8. learning consists in using examples to make generalizations.

Against this background, the limits of Sampson's framework are clear. For example, some of the above (1, 3, 4, 5) lead him to conclude that, because grammar is cultural, it has no bearing on affective, sensorimotor or representational worlds. Simultaneously, his empiricist view of mind (4, 5, 7, 8) separates these putative cultural products from evolving aspects of cognition and behaviour. On the contrary, rejecting autonomy, leads to an evolutionary view quite different from Pinker's. Firstly, far from being conceptualized as an organ, language is taken to be part of behaviour. Secondly, as behaviour, it is hypothesized to have emerged from evolutionary interaction of genotype and phenotype. Thirdly, as Mayr stresses (1988a) — and contrary to Pinker — this implies that biology cannot be reduced to physics.

When utterances are analysed as linear configurations of morphemes, construal can be modelled as a causal process that maps sentences to brain-events. Accordingly, Sampson and Pinker apparently accept that, in the first place, understanding arises as form-based cues cause us to conjure up specific representations. In a given context, then, cognitive processes enable brains to conjure up paraphrase-based 'semantic' information. Although quibbling as to whether it is deductive, both treat understanding as 'private'; further, they assume that learning can be defined by the generalizations that result from this process. In short, in spite of differences, both accept causal models of understanding and learning.

Abandoning linguistic autonomy implies that, like languages, words and sentences are indeterminate. In other words, since there is no specifiable 'input', causal theories of understanding and learning must be counterfactual. For this

⁷ The classic statement of this view is found in *Language* (Bloomfield, 1933. p. 144).

reason rejection of linguistic autonomy makes it theoretically objectionable to treat understanding as ‘processing’. Many observations support the idea. Firstly, far from being internal and person-neutral, understanding seems to reflect who we are, what we know, and what we think and assume. Secondly, like Sacks’s aphasics who laughed at President Reagan, normal people exploit linguistic forms together with prosody, gesture and facial expression. Thirdly, understanding is influenced by how persons attend, hear, listen, see and look. Fourthly, when accompanying talk, it reflects present, past and anticipated experience. In integrational terms, understanding is “contextualization” (see, Harris, 1981, 1995, 1997): like learning, it is powered by sociohistorical circumstances, personal relationships, who is talking and listening and how activity is co-ordinated.

Understanding emerges in joint activity, is indeterminate and occurs in time. Moreover, since it often arises between persons, it cannot be the outcome of a single brain’s activity. Further, since it is unpredictable, it must involve some kind of creativity. Thus, while Pinker and Sampson place creativity beyond debate, the radical takes it have a basis in how, during dialogue, we contextualize words spoken. Levinson (1995) suggests that this characteristically dialogical creativity must be explained by recognizing that communication exploits “interactive thinking”. Much of what this implies can be captured by tendencies to rely on what are theorized as “implicatures” (see, Levinson, 1983, 1995). However, since these are either probabilistic or logical, they can account for only a fraction of dialogical sense-making. Interactive thinking, then, in short, must also exploit utterance-linking whose ‘creativity’ cannot be explained by social routines.

Once post-Bloomfieldian assumptions are dropped, we can use activity theory (e.g., Axel, 1997), to hypothesize that social behaviour exploits bodies to mediate words. Utterances — and accompanying activity — thus provide culturally specific, body-based ways of connecting individuals. Indeed, as I have shown elsewhere, acoustic-based descriptions of vocal attunement can be used to clarify how individuals jointly make sense of vocalizations (e.g., Cowley, 1994, 1998). The interindividual play of sound and gesture is, I argue, intrinsic to the interactive thinking from which dialogical creativity emerges. Acknowledging the omnipresence of this routine form of creativity, I believe, opens the gates to non-dualist ways of theorizing the microgenesis of word-based understanding.

Rather than focus empirical issues, in this context, I use literary observations to evoke echoes of dialogical creativity. As Bakhtin (1984) notes, Dostoevsky’s ‘voices’ give his novels their dialogical uniqueness. How, though, does the technique work? How does an interplay of voices make the saying reach beyond the said? With these questions in mind, consider the following:⁸

⁸ The example may have been sparked by Wittgenstein’s “We say a dog is afraid his master will beat him; but not, he is afraid he will beat him tomorrow. Why not?” (1958, § 650). Discussion only touches on the issues: hearing an utterance can spark very different contextualizing activity from that associated with construing a written expression.

1. he expects his master to come tomorrow;
2. he is expecting his master to come.

Can both expressions be applied to dogs? Why don't we say dogs expect their masters to come tomorrow? Is it, as a post-Bloomfieldian argues, a matter of semantics? Do we rely on 'encyclopaedic-knowledge' about dogs? Or, is Wittgenstein correct to regard the last two questions as philosophical mistakes? Anyway, precisely how you respond matters less than whether the contrasts between (1) and (2) draw closely on their 'literal' meaning. In responding creatively, I suggest, this relation is typically tangential: the sentences assume a particular sense.

The extraordinary human capacity for particularization, Wittgenstein believes, is usually overlooked (Wittgenstein, 1958, § 534). Indeed, the associated philosophical muddles stop us from recognizing that we hear words in multiple 'aspects'. Blindness to the complexity of the conceptual (or 'grammatical') may also be part of what blocks recognition of dialogical creativity. Yet — unless we possess innate concepts — only a capacity to reach agreement in judgements will explain why we hear utterances as fitting their contexts. Indeed, we may respond, how could human doings ever be understood without such a capacity? If this is so, much of what we do when listening, hearing and responding is motivated and shaped by the interactive thinking that helps us shift perspectives and induce each other to talk. On this view, much understanding arises from a body-based interplay, a characteristically human propensity for subtly responding to the doings of other individuals.

During talk ideas that arise can often be expressed in propositional terms. Where Pinker and Sampson go off track, then, is in assuming that this results from an ability to verbalize brain-events. Indeed, it is this mistake that leads them to argue about whether they are dealing with complex deductive or inductive processes. The integrational alternative asserts that, on occasion, people contextualize utterances by giving voice to what they hear as 'new' thoughts. Not the recall of generalizations but the re-evocation of contextualizing acts is what provides sound evidence of learning. Although ideas can be formed by generalizing, they also emerge in real-time responding. Dialogical creativity works, often, by acting so that, at a given moment, other people's words and actions acquire a particular sense.

Related ways of understanding develop in animal learning. In pigeons, for example, 'internal' particularization is "shaped" by ensuring that certain responses are "selected" (e.g. Cohen, 1987). Learning theory, however, cannot account for that dialogical creativity that draws on some degree of consciousness and bodily meshing of voice and gesture. Even in responding to (1) and (2) what happens is activity that occurs, at very least, on the fringes of consciousness. For readers who respond, particularization occurs at a given moment. Secondly, even in going back to the sentences, no contextualization can be repeated. Thirdly, for any occasion, an outcome can be predicted only probabilistically (Many readers conclude: "dogs cannot think 'tomorrow'"). Fourthly, in dialogue at least, if particularization

occurs, it shapes how you ‘go on’. By recognizing that understanding transcends the said, the radical uses the LI debate to champion the view that language is intrinsic to human activity.

To emphasize that talking and acting are inseparable from understanding and learning, it is necessary to emphasize contextualization. Moreover, in talking, form-based paraphrase can be very marginal to what we think and do. Thus, responses to (1) and (2) show the putative denotata of *expecting*, *master* and *tomorrow* to have a relatively small part in ‘going on’. What is more important is, almost certainly, the reader’s attitude together with practical experience of dogs as well as ‘philosophical’ texts. Utterance-activity, then, is inseparable not just from culture but also from joint action. Biologically inclined scholars must ask *how* our genetic patrimony constrains human contextualizing. Unless language is separate from mind, brain and behaviour — and the idea is preposterous — we need explication of how language-based contextualizing influences activity (and vice versa). Only such a radical approach can ensure that the biological baby is not thrown out with the generativist bathwater.

In conclusion, no dispassionate reading of Pinker is likely to convince a reader of the existence of a language instinct. His fascinating, converging evidence does little more than point us at the idea that talking, like other contextualizing activity, has its basis in biology. And, indeed, this claim will be challenged only by religious fundamentalists. What Sampson, to my judgement, successfully demolishes is Pinker’s thesis that we possess innate knowledge of the X bars, traces, cases and other representations posited in generativist theory. Although advocates of the theory have worked hard at fulfilling the requirements of coherence, their products deserve to be treated with radical scepticism. Forty years of intensive research have failed to provide any empirical base for their theorizing. Furthermore, not only do the general theories they have spawned reaffirm the language myth (see, Harris, 1981, 1997) but, once this is seen, their flaws are all too obvious. As emerges in Pinker’s writing, their theories are riddled with implausibility, use evidence filtered through counterfactual idealization, and rely on an unexamined methodological commitment to formal analysis. Nonetheless, while my reading of *Educating Eve* suggests the LI has been demolished, few, I suspect, will embrace Sampson’s coherent, conservative alternative. Even if, as seems likely, his argument about the origins of hierarchical structure is correct, the link with dualism gives his conclusion a medieval flavour. Not only will it not generate research but, at this sociohistorical moment, even open-minded readers will find themselves hard-pressed to accept its ontological implications. In conclusion, then, an intriguing debate convinces this reader that, to address basic issues in language study, we must reconceptualize how cultural development interacts with a host of social practices. Just as fundamentally, however, we need to rethink how the causal processes of biology function through language-activity to bind individuals into the dynamics of human life. Even in a complex, culture bound, social ecology, natural selection can only operate through the myriad of ways in which individuals act to contextualize experience. It is by seeking to explicate varying patterns in language-activity — not by positing a language

instinct — that linguists, biologists and others can develop understanding of how the human genome constrains the sociocultural development of languages.

References

- Axel, E., 1997. One developmental line in European activity theories. In: Cole, M., Engeström, Y., Vasquez, O. (Eds.), *Mind, Culture and Activity*. Cambridge University Press, Cambridge, pp. 128–146.
- Bakhtin, M., 1984. In: Emerson, C. (Ed.), *Problems of Dostoevsky's Poetics*. University of Minnesota Press, Minneapolis (Originally published, 1963).
- Bickerton, D., 1990. *Language and Species*. University of Chicago Press, Chicago.
- Bidell, T.R., Fischer, K.W., 1997. Between nature and nurture: the role of human agency in the epigenesis of intelligence. In: Sternberg, R.J., Grigorenko, E. (Eds.), *Intelligence, Heredity and Environment*. Cambridge University press, Cambridge, pp. 193–242.
- Bloomfield, L., 1933. *Language*. University of Chicago Press, London.
- Byrne, R.W., Whiten, A., 1988. *Machiavellian Intelligence: Social Expertise and the Evolution of Intellect in Monkeys*. Cambridge University Press, Cambridge.
- Chomsky, N., 1957. *Syntactic Structures*. Mouton, The Hague.
- Chomsky, N., 1959. Review of B.F. Skinner, 'Verbal Behaviour'. *Language* 35, 26–58.
- Chomsky, N., 1965. *Aspects of the Theory of Syntax*. MIT Press, Cambridge, MA.
- Chomsky, N., 1976. *Reflections on Language*. Fontana, London (US ed., Temple Smith, 1975).
- Chomsky, N., 1986. *Knowledge of Language: Its Nature, Origin and Use*. Praeger, New York.
- Cohen, D., 1987. Behaviourism. In: Gregory, R.L. (Ed.), *The Oxford Companion to the Mind*. Oxford University Press, Oxford, pp. 70–74.
- Cowley, S.J., 1994. Conversational functions of rhythmical patterning: a behavioural perspective. *Language and Communication* 14, 353–376.
- Cowley, S.J., 1998. Of timing, turn-taking and conversations. *Journal of Psycholinguistic Research* 27/5, 541–571.
- Dawkins, R., 1986. *The Blind Watchmaker*. Penguin, London.
- Deacon, T., 1997. *The Symbolic Species: the Co-evolution of Language and the Human Brain*. Penguin, London.
- Dunbar, R.I.M., 1996. *Grooming, Gossip and the Evolution of Language*. Faber & Faber, London.
- Fodor, J.A., 1975. *The Language of Thought*. Harvard University Press, Cambridge MA.
- Gibson, K.R., Ingold, T., 1993. *Tools, Language and Cognition in Human Evolution*. Cambridge University Press, Cambridge.
- Goody, E. (Ed.), 1995. *Social Intelligence and Interaction*. Cambridge University Press, Cambridge.
- Gopnik, M., 1990. Feature blind grammar and dysphasia. *Nature* 744, 715.
- Gopnik, M., Crago, M., 1991. Familial aggregation of a developmental language disorder. *Cognition* 39, 1–50.
- Harris, R., 1981. *The Language Myth*. Duckworth, London.
- Harris, R., 1995. *Language, Signs and Communication*. Routledge, London.
- Harris, R., 1997. From an integrational point of view. In: Wolf, G., Love, N. (Eds.), *Linguistics Inside Out*. Benjamins, Amsterdam, pp. 229–310.
- Harris, Z., 1951. *Methods in Structural Linguistics*. University of Chicago Press, Chicago.
- Humphry, N.K., 1976. The social function of intellect. In: Bateson, P.P.G., Hinde, R.A. (Eds.), *Growing Points in Ethology*. Cambridge University Press, Cambridge, pp. 303–318.
- Jackendoff, R.S., 1990. *Patterns in the Mind: Language and Human Nature*. Harvester Wheatsheaf.
- Levinson, S.C., 1983. *Pragmatics*. Cambridge University Press, Cambridge.
- Levinson, S.C., 1995. Interactional biases in human thinking. In: Goody, E. (Ed.), *Social Intelligence and Interaction*. Cambridge University Press, Cambridge, pp. 206–220.

- Linell, P., 1979. *Psychological Reality and Phonology: a Theoretical Study*. Cambridge University Press, Cambridge.
- Matthews, P.H., 1967. Review of Chomsky. *Journal of Linguistics* 3, 119–152.
- Matthews, P.H., 1979. *Generative Grammar and Linguistic competence*. Allen & Unwin, London.
- Matthews, P.H., 1991. *Morphology*, 2nd ed. Cambridge University Press, Cambridge (1st ed., 1974).
- Matthews, P.H., 1993. *Grammatical Theory in the United States from Bloomfield to Chomsky*. Cambridge University Press, Cambridge.
- Mayr, E., 1988a. Is biology an autonomous science? In: *Toward a New Philosophy of Biology*. Harvard University Press, Cambridge, MA, pp. 8–23.
- Mayr, E., 1988b. The multiple meanings of teleological. In: *Toward a New Philosophy of Biology*. Harvard University Press, Cambridge, MA, pp. 38–66.
- Moore, T., Carling, C., 1982. *Understanding Language: Towards a post-Chomskyan Linguistics*. Macmillan, London.
- Murphy, F. 1998. Review of Sampson. Posted on the Linguist list 16/05/1998.
- Nelson, K., 1996. *Language in Cognitive Development*. Cambridge University Press, Cambridge.
- Pinker, S., 1994. *The Language Instinct: the New Science of Language and Mind*. Penguin, London.
- Pinker, S., 1997. *How the Mind Works*. Norton, London.
- Pinker, S., Bloom, P., 1990. Natural language and natural selection. *Brain and Behavioural Sciences* 13 (4), 707–784.
- Pullum, G., 1996. Review article: Nostalgic views from Building 20. *Journal of Linguistics* 32, 137–147.
- Reddy, M., 1979. The conduit metaphor: a case of frame conflict in our language about language. In: Ortony, A. (Ed.), *Metaphor and Thought*. Cambridge University Press, Cambridge, pp. 284–324.
- Sacks, O., 1985. *The Man who Mistook his Wife for a Hat*. Duckworth, London.
- Sampson, G., 1980. *Making Sense*. Oxford University Press, Oxford.
- Sampson, G., 1997. *Educating Eve*. Cassell, London.
- Simon, H.A., 1962. The architecture of complexity. *Proceedings of the American Philosophical Society* 106, 467–482.
- Skinner, B.F., 1957. *Verbal Behavior*. Appleton Crofts, New York.
- Turing, A., 1950. Computing machinery and intelligence. *Mind* 59, 433–460.
- Vargha-Khadem, F., Passingham, R.E., 1990. Scientific correspondence. *Nature* 346, 226.
- Vargha-Khadem, F., et al., 1995. Praxic and nonverbal cognitive deficits in a large family with a genetically transmitted speech and language disorder. *Proceedings of the National Academy of Sciences of the United States of America* 92, 930–933.
- Wittgenstein, L., 1958. *Philosophical Investigations*, 2nd ed. Blackwell, Oxford.
- Wray, A., 1998. Protolanguage as a holistic system for social interaction. *Language and Communication* 18, 47–67.