

Reply to Commentary

Hagen Replies to Hirschfeld (2008)

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**Abstract:** Hirschfeld's (2008) thoughtful comments on my article on the bilingual brain are a valuable contribution to what I find to be an exciting and fruitful interdisciplinary investigation in evolutionary linguistics. I think his reply will help us flesh out both the biological and the environmental forces that have led to the human endowment for language. Even so, Hirschfeld's conclusion – that the well-known difficulties which adults face in acquiring second languages are somehow proof of an environment in which early hominid bands frequently commingled - is at variance with virtually everything we know from the many disciplines that are now involved in the debate over the evolutionary origins of language.

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In his reply to my article in *Evolutionary Psychology*, Hirschfeld argues that “what we know about human language capacities leads to a very different conclusion” than the one I expressed in Hagen (2008), namely that “[i]f language evolved in some group that did not have sustained and peaceful contact with others, then a bilingual brain would not be of much use, natural selection would not have favored it, and we would end up with exactly the state of affairs we now have (pp. 57-58).” The state of affairs I was referring to is that children are endowed for rapid and easy language acquisition and adults are not.

Perhaps the best way to put the disagreements between Hirschfeld and myself into perspective is to point out that the *actual* ontogenesis of language ability, first or second, is one of any number of *logically possible* ontogeneses. I can think of four such. Let us, for example, imagine (1) a *late acquisition scenario*, according to which humans would experience onset of language acquisition at a later age - say at ten years instead of two – but would retain a learning potential throughout the lifespan. Next, let us imagine (2) a *minimalist scenario*, by which we would be endowed with a bare-bones set of grammar rules something along the lines of an artificial language like Esperanto that would be innately specified in all speakers of all languages, so that adult second language acquisition would simply be the relatively easy matter of acquiring the vocabulary of a foreign group. Then there is (3) a *gradualist scenario* by which, say, onset of acquisition would be at a very young age but full fluency would not come about until adulthood. And finally, let us imagine (4) an *unbounded scenario*, by which language would develop in a brain of unbounded plasticity, so that adult second language acquisition (SLA) would be no different than child first language acquisition. Whenever adults or children learn a new language, they would just start from scratch.

The debate we are now having boils down to this: Why did evolution select our *actual* ontogenesis of language rather than one of these *possible* ones? Hirschfeld tries to answer this question first by arguing that “that the ease with which children simultaneously learn multiple languages evinces a state of sustained cooperation and exchange between groups such that speakers of different groups, speaking different languages, recurrently commingled over long periods of time” (pp. 182-183) It is worth noting in the first place that the end of Hirschfeld’s discussion includes a strong argument against this position. He writes that “the period during which most complex cognitive functions evolved was characterized by extremely sparse settlement patterns,” (p. 184) which hardly counts as “evidence for an ancestral environment in which distinct groups commingled through long-term trading and marriage relationships) in relative security” (p. 182). I should point out as well that when linguists describe childhood language acquisition as “rapid,” they mean rapid with respect to (a) the complexity of the task, and (b) the laborious pace at which adults manage to do the same thing. In reality, it takes about two years of sustained (not occasional!) exposure for a child to become a fluent speaker of a language.

Hirschfeld further argues that child bilingualism is “all the remarkable since some of the processes that enable bilingual acquisition (e.g., establishing two distinct lexicons) would otherwise seem to compete with processes that enable single language acquisition (e.g., a single word for each whole object)” (p. 183). Hirschfeld is wrong on both counts. Language acquisition is nothing at all a process of “learning a single word for each whole object.” A child may learn many words for a certain “whole object” like a certain small friendly animal, e.g., *dog*, *dachshund*, *hound*, *pet*, *Fred*, *animal*, *canine*, *mutt*, *animal*, *beast*, *critter*, etc. Even among monolinguals, learning synonyms has no negative effect on prior learned knowledge. And as I pointed out in my original article, learning new words is the one aspect of language acquisition that is *not* adversely affected by age.

It is true, as Hirschfeld notes, that children can acquire several languages without significant decrement to first language acquisition. But then, so can adults: they just can’t do it nearly as easily as children can. Hirschfeld cites this in support of his position by arguing as follows:

During the period in which young children acquire their first language, they are capable of (and often do) acquire several languages *without significant decrement to first language acquisition*. This ability to effortlessly acquire several languages is a singular design feature of the LAD. What other complex cognitive skill is unaffected by doubling or even tripling the acquisition task? (p.183)

The short answer to his rhetorical question “what other complex cognitive skill is unaffected by doubling or even tripling the acquisition task?” is “almost all of them.” Mathematics is surely cognitively complex, but one’s understanding of addition is not adversely affected by a subsequent learning of multiplication, and learning multiplication, in turn, is not adversely affected by the simultaneous learning of division. A gifted musician can learn or even compose a richly elaborate symphony for 30 or more instruments without adversely affecting her knowledge of other symphonies she has learned, or is learning. Moreover, the most current research in theoretical syntax has shown that languages do not vary in any but the most superficial ways (see Baker, 2002; Boeckx, 2006). The mystery for theoretical linguists is not that children can acquire more than one language, but that they can acquire abstract linguistic principles in the first place.

Next, Hirschfeld turns to the acquisition of foreign accents (almost always a dead giveaway of someone who has acquired a language in adulthood) and their relevance to

prehistoric raiding parties and the subjugation of fertile women. His hypothesis leads him to the essentially meaningless conclusion that “a language learner’s propensity *not* to acquire foreign-accented pronunciation seems a plausible feature of an evolved LAD.” Under the circumstances he describes, the victim of an intergroup raid will acquire the accent of her captors, so long as she is kidnapped at a young age. It is only when she is captured and kidnapped after adolescence that she will acquire the language of her captors with difficulty, and therefore retain traces of her first-language pronunciation. It is difficult to see how those facts support the view of an ancestral environment in which distinct groups typically commingled in relative security.

Finally, Hirschfeld writes:

Much of my speculation here is based on a fairly simple observation: in terms of complex cognitive mechanisms, it is less languages that have evolved than language acquisition devices. Increasingly more complex linguistic structures emerged as distinct LADs evolved, presumably as adaptations to challenges grounded in shifts in the human and nonhuman environments. (p. 184)

It is not at all clear what this is intended to prove. The evidence that languages have evolved – and have done so in ways that parallel natural evolution to an uncanny degree - is immense and irrefutable. The discipline we call historical linguistics would be as pointless as phrenology if languages did not mutate over time. In fact, as I pointed out the original article, language mutation and language drift are evidence of long periods of cultural isolation; still more evidence against Hirschfeld’s hypothesis. Plausibly the LAD (actually, it’s now called UG for “Universal Grammar” in most linguistic work) did evolve in the 2 million year history of the genus *Homo*. However there is no evidence that it has evolved appreciably during the 200,000-year history of *Homo sapiens*, and there is no evidence that linguistic structures have become cognitively more complex. What happened before the advent of *Homo sapiens* is anybody’s guess. Whatever our actual evolutionary history was, the one thing that is clear is that our brains did not evolve in a manner that facilitates adult language acquisition. Ironically, that is the one fact that Hirschfeld does not even try to explain in his reply.

All told, the view of prehistory that emerges from Hirschfeld’s hypothesis is that Pleistocene hunter-gatherers lived in small bands that were widely diffuse across the Eurasian and African continents; that they traveled at the whims of migratory animals on which they depended; that they nevertheless managed to stay in permanent contact with other small bands that were following other herds; that they did so with no sophisticated means of communication; that their children stayed with these other bands for years at a time in order to become fluent in a foreign language, and that adults did not (or else they too would have evolved an endowment for easy language acquisition); that this was a universal habit of hunter-gatherer bands that resulted in a universal endowment for bilingualism; that all children of all bands participated in these foreign exchange programs; and that in spite of these common interactions, there later evolved thousands, and perhaps tens of thousands, of mutually incomprehensible languages. The only motivation we have for accepting this implausible scenario is a lingering distaste among some anthropologists for the Hobbesian view of humanity before civilization.

The constraints on adult SLA make a lot more sense when we compare our language phylogeny to a more familiar case. When Darwin visited the Galápagos Islands, he was struck by the variety of giant tortoises (Darwin 1845/1957, pp. 359-361). The regions of the Galápagos where the vegetation grew close to the ground were inhabited by tortoises with a domed carapace that limited upward mobility of the animal’s neck. The regions where vegetation was higher off the ground, on the other hand, were inhabited by animals with longer limbs and an arched

carapace that allowed the neck to reach vegetation on bushes. The job of the naturalist is to figure out what sort of history led to this state of affairs. Surely the tortoises were not purposefully designed in that way: the parsimonious solution would have been to create only arched-shells, which are no impediment to eating vegetation on the ground. Surely the two subspecies did not commingle among the islands, because then we would expect to see arched and domed carapaces equally distributed across the islands (or, more likely, only one phenotype). The truly bizarre state of affairs would have been to find the domed shelled tortoises on islands where brush is abundant, and the arched shells on islands where there is no brush. A nearly equally bizarre state of affairs would be to find hunter-gatherer adults who had a flair for second language acquisition even though it did them no good. In other words, if our hunting-gathering ancestors lived in a world “characterized by extremely sparse settlement patterns” as Hirschfeld asserts, then an endowment for adult second language acquisition would have been for them what an arched carapace would be for a tortoise living on an island with no bushes, i.e., a trait that would have brought with it no survival advantages and therefore would not have made the evolutionary cut.

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