

Proposed "Sex Survey"

William Booth incorrectly writes that I called the National Institutes of Health (NIH) "sex survey" "pornographic" (News & Comment, 28 Apr., p. 419). Used in such a limited explanation of the NIH survey, the connotation of the survey as pornographic conjures up images of language befitting a stereotypical religious zealot.

What I have said is that the survey seems more apropos for the pages of a pornographic magazine, with explicit sexual questions for a very limited audience, than as something to be passed off as a scientific study.

As for the survey's proponents, "who include a blue-ribbon panel of social scientists," clearly the American taxpayer views the blue ribbons in a different light—more along the lines, say, of awards to an omnivorous prize porker that has spent its life parked in front of the public trough.

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A Specialization for Speech Perception?

Alvin M. Liberman and Ignatius G. Mattingly (Articles, 27 Jan., p. 489) write that general auditory and cognitive processes are inadequate to explain much of speech perception, and that one must posit the existence of an innate specialized "phonetic module" to recover phonetic gestures. This putative specialization is offered as an explanation for both "computing the articulator movements [production] and . . . for dealing with the acoustic consequences [perception]." We suggest that this proposed solution to difficult problems in speech perception is an extravagant one and, while perhaps appropriate for a time when less was known about general auditory and cognitive processes, it stands at odds with more recent experimental findings.

Liberman and Mattingly say that their view of the special nature of speech is unconventional. This is only partially correct. Few would dispute the presence of specialized brain mechanisms for human communication, as the many studies of aphasia will attest. However, our growing knowledge of auditory and cognitive processes is helping to explain many fundamental facts about speech. For example, there exists a number of regularities in phonetic inventories used

by different languages. Some speech sounds are used almost universally, while others occur only rarely, if at all. And many of these regularities can be predicted only on the basis of auditory functions (1). Thus, it is general auditory processes that help provide an explanation for the range of phonetic units found in human speech (2).

Liberman and Mattingly discuss an interesting problem of how talkers and listeners come to agree upon phonetic categories. They recommend that "parity" between sender and receiver is provided by innate hardware. It bears note, however, that agreement on phonetic categories is no more difficult (and no easier) than agreement on most other sorts of categories frequently used, such as birds, trees, and chairs. The success of certain nonhuman animals in learning phonetic categories (3) strongly suggests that innate specialization is not a requirement for phonetic categorization.

The laboratory phenomenon of duplex perception is an interesting one. It should be noted, however, that duplex perception is not restricted to speech sounds (4). Furthermore, it seems odd to us that a speech-specific module should be capable of incorporating nonspeech sine-wave components in its operation. In any event, Liberman and Mattingly seem prepared to abandon their strong claim that the phonetic module precedes other auditory analysis.

Finally, one unfortunate consequence of embracing the postulation of a speech-specific module is that there remains no way to apply all that we continue to learn about general auditory and cognitive processes. One could, as Liberman and Mattingly suggest, look forward to classifying and arranging future hypothetical modules. However, we suggest that a theory of speech perception should be evaluated, like any scientific theory, by its predictive power, simplicity, and generality. In the spirit of parsimony, the more fruitful approach is to learn all we can about general processes of audition and cognition in order to further develop a theory that predicts fundamental phenomena of speech perception.

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Response: It is surely not a criticism of our position that some of the phonetic regularities across languages conform to certain properties of the auditory system, since, as must be obvious, the gestures that evolved for phonetic communication would have been selected only if the sounds they produced could be resolved by the ear.

The requirement of parity, which applies only to communication systems, is that what count as message units for the sender must count as message units for the receiver (1, 2). Such a requirement is in no way relevant, although Kluender and Greenberg appear to think it is, to "agreement on most other sorts of categories frequently used, such as birds, trees, and chairs."

Despite the claim, referred to by Kluender and Greenberg, that research with Japanese quail shows that nonhuman animals perceive phonetic structures as humans do, there is evidence that monkeys do not (3).

Duplex perception is a phenomenon in which listeners form a coherent percept by combining two acoustically nonoverlapping stimuli that are simultaneously perceived as coming from two different sources, even from two different locations, with the result that one stimulus simultaneously yields perceptual representations of two distinctly different types, for example, a phonetic structure and a nonspeech chirp [references 8 to 11 in (2)]. Two of the papers cited by Kluender and Greenberg as examples of duplex perception in the nonspeech domain deal with binaural interactions in the extraction of pitch from noise, but not, so far as we can tell, with duplex perception. Neither of the other two papers includes the critical tests, described in detail in our paper, that rule out the possibility of a trivial "cognitive" interpretation. Further research by Fowler and Rosenblum, authors of one of those papers, shows that their example does not, in fact, pass all of those tests (4). On the basis of our own observations, we believe that the other example will not pass, either. Of course, there is no reason in principle why other combinations of distinctly different processes should not yield duplex perception and thus offer testimony to their distinctness, but so far, no convincing examples have been offered.

Rather than being "odd," as Kluender and Greenberg say, it is, to the contrary,