C. P. SNOW'S TWO CULTURES AND THE NATURE-NURTURE DEBATE

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More than fifty years have passed since C. P. Snow gave the Rede Lecture in the Senate House at Cambridge University. It was May 7, 1959, when he aired his worry that the majority of his colleagues in the humanities were scientifically illiterate and the majority of his colleagues who were scientists were disinterested in literature. His worry was that two cultures had emerged and were less and less able to understand each other. By way of graphic illustration, Snow argued that scientists would struggle to read a Charles Dickens novel and most humanities professors would be unable to state the second law of thermodynamics. "So the great edifice of modern physics goes up," he declared, "and the majority of the cleverest people in the Western world have about as much insight into it as their neolithic ancestors would have had."

Snow was by training a scientist, who turned his hand to writing novels, exemplifying that rare breed of person who attempts to straddle both cultures. In 1962, Cambridge professor of literature F. R. Leavis scathingly wrote of Snow's lack of ability as a novelist, in an effort to rubbish his "two cultures" argument. Leavis's attack was rightly dismissed as *ad hominem*. But was Snow correct?

If he was, then given the remarkable rate of progress in science over the last fifty years, the gulf between these two cultures may have widened. On the other hand, through the efforts

of John Brockman and other literary agents and publishers who have encouraged scientists to communicate to the wider public, creating the so-called third culture, science is now very accessible to nonscientists. So has the gap between Snow's two cultures become wider or narrower?

I think the answer is both. The gap has narrowed thanks to wonderful books like Steven Pinker's *The Language Instinct.* It should now be virtually impossible for a linguist to see language as just a product of culture instead of also a product of our genes. Pinker's book epitomizes what the third culture should be like, illustrating the complex interplay between biology and culture in producing human behavior. Scientists find the idea of a biology/culture interaction unsurprising, almost truistic. As a psychologist, I can think of few if any examples of human behavior that are entirely the result of culture, and I assume that most people interested in human behavior adopt the same moderate position of acknowledging a biology/environment interaction. To be a hard-core biological determinist or a hard-core social determinist seems extreme.

I studied Human Sciences in Oxford in the 1970s, which some people joked was right in the middle of the Banbury Road, the Department of Social Anthropology being on one side and the Department of Biological Anthropology on the other. The Human Sciences students felt like bilingual children, who could not only switch between the two cultures when appropriate but automatically thought about topics in a multidisciplinary way, even if their academic "parents" in each department rarely crossed the road to learn about the other's culture. I would like to think we've come a long way and that there is now rich interchange between disciplines, at least in the study of human behavior.

But I worry that the gap between C. P. Snow's two cultures has in some areas remained as wide as ever and may even have widened. By way of illustration, consider the field of sex differences in the mind. My own view is that research into sex differences teaches us two things: First, one cannot infer what kind of mind a person will have purely on the basis of their gender, since an individual may be typical or atypical of their gender. Indeed, to do so would be stereotyping and sexist. Second, where one finds sex differences *on average* when comparing groups of males and groups of females, these differences are likely to reflect a mix of causal factors, from parenting styles and peer-group influences to the amount of testosterone the fetus produces in the womb and the effects of sex-linked genes.

However, even today one still finds academics claiming that there are no universal sex differences in, for example, language—on the grounds that any sex differences in language and communication are either culture-specific or do not replicate. Such claims effectively reduce sex differences in language to peculiarities of a particular culture or a particular experiment, thereby needing no reference to biology. While I would agree that the similarities in men's and women's conversational styles are greater than are the differences, when it comes to *children's* language acquisition my reading of the evidence is that the differences, on average, between boys' and girls' language development are nontrivial and likely to be universal. Here are just two pieces of experimental evidence.

First, girls typically show faster growth in vocabulary size than boys. This is seen in a large Russian study of 550 girls and 487 boys, aged 18-36 months, mirroring patterns found in a different culture, England. Second, boys' rate of stuttering and other speech problems is at least twice as high as that of

girls. This is revealed in an even larger data set from the National Survey of Children's Health, which sampled more than 91,000 children aged three to fourteen across the United States, including children of different ethnic backgrounds. Social determinists might want to take the data from such studies and try to explain it purely in terms of postnatal experience, but since mutations in genes (such as GNPTAB and CNTNAP2) have been associated with stuttering and language impairment, it's likely that individual differences in typical language development (including typical sex differences) will also turn out to have a partly genetic basis.

No one denies the important role that experience and learning play in language development. What worries me is that the debate about gender differences *still* seems to polarize nature vs. nurture, with some in the social sciences and humanities arguing that biology plays no role at all, apparently unaware of the scientific evidence to the contrary. If he were still alive today, C. P. Snow might despair, as I do, that despite efforts to communicate the science to a wider public, the field of sex differences remains a domain where the two cultures are separated by a deep chasm.