



Book Review

Sex and Cognition by Doreen Kimura
Cambridge, MA: MIT Press, 2000.

Reviewed by Dahlia W. Zaidel

There has always been a fascination with differences in the cognitive abilities of women and men. Why is it that the best known musical composers are men, conductors are largely men, most classical concert musicians are men and only a small number are women? Similarly, it seems that the majority of experimental and theoretical physicists are men while among astronomers, who rely on physics, quite a number are women. Explanations that put the blame on societal rules and prejudices provide only part of the answer, although before the middle of the 20th century such prejudices were real. An alternative approach is to systematically and empirically study sex differences in cognition. For more than 30 years Doreen Kimura, the author of *Sex and Cognition* has been a leading researcher in the field of neuropsychology and sex differences. Her laboratory has consistently formulated interesting and critical questions in this field, and has generated the best, most reliable studies. The emphasis in the book is on the findings from those studies.

With paper and pencil tests, men score consistently higher than women on items that tap visuo-spatial abilities and this outcome is used to explain why men are better than women when navigating their way around in outdoor space. But, as Kimura points out, women have

very good visuo-spatial memory for items located in space close to the body. They know the location of items in the home, office, car and so on, better than men. This is not because women have better memory in general than men; it is because there is space and there is space, and women do better in personal- rather in extra-personal space. Unfortunately, this ability is not tapped in standardized tests.

The right cerebral hemisphere specializes in visuo-spatial perception and topographical knowledge, and men score higher than women when the input is restricted to the right hemisphere, or conversely, obtain substantially lower scores than women on such tasks following damage to this hemisphere. Now, the left hemisphere specializes in language, and damage leads to aphasia, language impairment in speaking, comprehending, or both. The fact that women score lower than men in right hemisphere tasks was for many years explained in terms of the crowding out effect, a concept referring to a left hemisphere functional takeover of the right hemisphere, crowding out right hemisphere functions. Kimura pointed out that if this were the case then we would see a higher rate of aphasia among women with damage in the right hemisphere. But the rate of right hemisphere aphasia is rare and when it is seen, there

is no sex difference in its occurrence. There must be another explanation, then. One possibility is that the type of tests that are administered to tap hemispheric functions are not sensitive enough to show subtle differences between the sexes, particularly in visuo-spatial abilities.

The nature of the organization of language centers within the left hemisphere is not the same in women and men. Kimura found that there is a sex difference in the intrahemispheric language control centers, particularly those located in the frontal and parietal lobes. Moreover, there is a greater left hemispheric anterior-posterior distance between language centers in women compared to men. This, however, does not explain why women are better than men in word production tests where the task is to produce as many words as possible in a limited time range.

Women do not outperform men in language tests across the board. The sexes do not differ in grammar, sentence construction, spelling, or reading comprehension. There does not seem to be a substantial sex difference in left hemisphere cognition. Even with right hemisphere cognition, the sex difference can be reduced if women are allowed more time to solve items loaded in visuo-spatial cognition.

The meat of the book begins in the third chapter, but the first two describe some fascinating facts. Research on anatomical body asymmetries in women and men as well as research on cognition in gay men were conducted in Kimura's laboratory and all of this is described in subsequent chapters. Not all findings on sex differences in cognitive abilities or in neuroanatomy have been covered. However, the critical and carefully thought out behavioral experiments are described. This small book by a highly knowledgeable, established, and insightful researcher is easy to read and is suitable both for students in the neurosciences and trained professionals.

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Reviewed by Vernon L. Quinsey

Doreen Kimura is Professor of Psychology at Simon Fraser University. She provides an accessible and brief summary of sex differences in cognition in this book. Many of the findings are derived from the program of research she maintained for many years at the University of Western Ontario.

It is likely to be a surprise to nonspecialist readers that there are so many sex differences in cognition and that some of them are of considerable magnitude. The documentation of these differences, together with their evolutionary implications, has been unwelcome in some academic and social policy circles. Kimura doesn't say much about the criticism her work has received but the book is organized so as to pre-empt knee jerk politically correct criticism and she makes a few comments that suggest that she is a little weary of it.

Another surprise to nonspecialists will be the findings on sex differences in directional bilateral dermatoglyphic asymmetry (people have more fingerprint ridges on their right than left sides and men are more strongly lateralized than women). Surprising, because homosexual men are less lateralized than heterosexual men, making the former resemble women more than the latter. This finding, among others, supports a neurohormonal organizational theory of sexual orientation.

In sum, Kimura has achieved her goal of writing an accurate summary of the research on

sex differences in a form suitable for a lay audience. The illustrations complement the text nicely and contribute to the book's comprehensibility.

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