LETTER

Questionable Aspects of Oliver Sacks' (1985) Report

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Dear Editor:

Oliver Sacks published an extremely influential book, The Man Who Mistook His Wife For A Hat, in 1985. One of the most intriguing stories in it is concerned with savant syndrome, which refers to the exceptionally high abilities shown by otherwise handicapped individuals (e.g., autism). His story is cited in many journal articles as well as popular science books.

To reiterate, he discovered that autistic twins spontaneously generated 6-digit prime numbers like a game. Then he joined them, with a book of number table of up to 10-digit primes. He challenged them with an 8-digit prime found in the book. The twins seemed to recognize it and responded with 9-digit primes. He again challenged them with a 10-digit prime in the book. They responded with a 12-digit number, and went even further, to the point of exchanging 20-digit numbers. He, with his book of 10-digit primes, could not confirm primality of those huge numbers.

This finding is important for not only psychologists but also for all scientists and mathematicians, as there is no algorithm to mentally identify primality for such huge numbers. (For relevant information, see Yamaguchi, in press).

However, can there be such a book? The prime number theorem indicates that the approximate number of prime numbers smaller than n is

$$\frac{n}{\log n}.$$

It is unclear from Sacks' report whether his book included all or some of 10-digit prime numbers. In any case, one must list more than 400 million numbers to include all the 10-digit and smaller primes ($n = 10^{10}$; precisely, there are 455,052,511 primes), and even the most conservative estimate is 50 million primes ($n = 10^9$; precisely, there are 50,847,534). It is impossible to include such a huge number of numbers in a single book, with a reasonable font size.

I contacted him recently and asked about it. According to him, not only the book but also other resources are now lost. He admitted that the book may have included only smaller numbers (e.g., up to 8-digit). Although I do not doubt that the twins had exceptional number abilities and that the report was a basically true story, one should not literally believe exact details of that report. Also notice the existence of skeptical views. (For instance, Dehaene, 2001, claimed that many of such reported abilities in the literature might have been "hagiography").

References

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