There is some evidence that **handedness** has a cultural component.

1. Experimental studies established that approximately 90% of the population are right handed.
2. Although there is some variation across societies, no society has a majority of left handers.
3. This suggests that right handedness has been favored by natural selection.
4. But then why isn't everyone right handed? Is there some process that is preserving left handedness?
5. Everything seems to suggest that there is a genetic component to handedness.
6. We would expect, then, that the more closely related a pair of individuals are, the more similar their handedness should be.
7. According to leading authorities: "knowledge of a person's handedness tells us virtually nothing of the handedness of that person's twin or sibling." Monozygotic twins have virtually the same concordance rate as dizygotic twins.
8. If the handedness of 1,000 monozygotic twins were measured against the handedness of 1,000 dizygotic twins, we would find that, on average, 772 monozygotic twins have the same handedness and 771 dizygotic twins would have the same pattern.
9. See "Handedness Statistics". It seems that there is a cultural effect on handedness.
    (a) Certain areas of the world view left-handers with suspicion. In China, were left-handedness is frowned upon, only 3.5% of children use their left hands compared with a 6.5% estimate for children from the same localities living in the United States.
    (b) Similarly for parts of the Middle East and Eastern Europe.
    (c) Thus, there seems to be some gene-culture coevolution going on.
10. Some evidence that there is a "dextralizing" allele that predisposes a carrier to right-handedness, and a neutral allele that puts handedness down to chance.
11. Further, there have been some selective sweeps of dextralizing genes throughout human evolution.
12. Models of the evolution of handedness suggest that, all else being equal, the dextralizing gene should be fixed. It is possible, that humans have, in fact, reached equilibrium but left-handers remain in the population because the dextralizing allele is weak.

13. What about patterns of handedness in families?

    (a) Other factors being equal, we would expect that 78% of people should be right handed.

    (b) Two right-handed parents increase the probability that their offspring is right handed by 14% to 92%.

    (c) On the other hand, two left-handed parents decrease the probability of right handedness by 14% to 64%.

    (d) The overall expected frequency of genetic model came out to 88% right handed, which is close to the observed value.

14. So there does some to be gene-culture coevolution. While there is a preference for right-handedness, parental influence (direct instruction, imitation, parents unintentionally shaping hand use) can influence the outcome.

15. There might be a connection with stone tool manufacture:

    (a) Hominins have been making tools for 2.5 million years.

    (b) Note connection with language and teaching; note also studies on tool making and instruction. Oldowan tools were around for a very long time: bad instruction? Acheulean tools are much more sophisticated, but took a long time to develop.

    (c) Tools are made by striking flakes from a core. We can tell from the flakes the handedness of the manufacturer:

        i. 57% of earliest tool makers were right handed (2.5 to 0.8 mya);

        ii. 61% of Middle Pleistocene hominins were right handed (0.8-0.1 mya);

        iii. 80-90% of Neanderthals were right handed (0.3-0.04 mya).

16. Note relationship between handedness and language lateralization.