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Fingerprint Lab Questions

Part 1:

Table 1: The histogram created from the provided class data

1. The average TRC for the class is 125.2.
2. The average TRC for the males in the class is 116. The average TRC for the females in the class is 126.8.
3. My TRC is bigger than both the class average and the average for females.
4. There is a difference between the average TRC for males and females. In our class, the males had a smaller TRC than the females, however this does not correspond with Holt’s averages of 145 and 126 for males and females respectively. However, the female average is very close to what Holt found it to be. The TRC difference between sexes may have to do with the sex chromosomes.
5. The histogram for our class correlates closely to figure 2. Most of the TRCs collected are found between 100 and 200. This can be seen in both histograms, although there are more students recorded in figure 2.
6. If there was more TRC data from more people, I think the histogram would become more prominent in the middle area between 100-200 because that is where the majority of people have their TRC. I think the histogram would look similar as ours appears to have a pretty common trend.

Part 2:

1. a. AABBCCDD male. 280

b. AabbccDd female. 80

c. AaBBCcDD male. 220

d. aaBbCCDd female. 140

1. Genotype of parents: AaBbCcDd

Genotype of child w maximum number of active alleles: AABBCCDD

* 1. TRC Mom: 140; TRC Dad: 160; TRC child: 280
  2. 1/64

1. a. The maximum number of ridge-producing genes possible in one of their children is 7.

b. The TRC if it is a female is: 230; the TRC if it is a male is 250.

c. If the child is male he will have a higher TRC than his mother who has the higher ridge count of 200.

d. The minimum number of ridge-producing genes possible in a child of this couple is 2.

e. If the child was female she would have a ridge count of 80, which is lower than her father who has the smaller ridge count of 160.

1. a. The child would not be able to have all of its alleles be active, but it would be able to have 7 active alleles. The probability of producing this child is 1/16.

b. If the child was a female, the TRC would be 230, if the child was a male the TRC would be 250.

5. I would expect my TRC to be most closely related to my parents and my siblings. My twin brother will most likely have more ridge counts than I do. My grandparents would have similar ridge counts as me but would be more closely related to their children- my parents.

6. The technique we are using to predict the number of ridges is based solely on two factors. There are other factors that may play roles in this inheritance and although our guesses may be pretty accurate, there is no way we can be 100% sure of the traits an offspring may have.

7. Multifactorial inheritance in the inheritance of traits based on multiple factors. This is what we looked at in this lab- by assuming fingerprints were related both to specific genes as well as to the gender of the individual. Most traits that we inherit are not determined just by one gene and therefore it is much more complicated to predict them than we would expect. Other than genes and gender, our traits can also be determined by environmental factors.