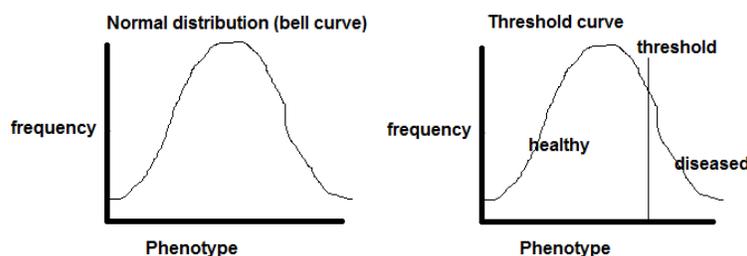


1. What is the difference between qualitative and quantitative or discontinuous and continuous characteristics? Which ones did Mendel work with?
Discontinuous or qualitative characteristics exhibits only a few, easily distinguished phenotypes (i.e. height tall vs dwarf).
Continuous or quantitative characteristics exhibit a continuous range of phenotypes (i.e. a range of heights between tall and dwarf).
The two differ in the number of phenotypes they exhibit.
Mendel worked with discontinuous or qualitative!
2. How does the relationship between genotype and phenotype change between discontinuous and continuous?
Discontinuous is straightforward; one genotype =one phenotype; or two or three if dominance and recessive.
Continuous is complex; each genotype may produce a range of possible phenotypes (ex. Plant genotype give diff. doses of hormones increase the plant height).
3. In continuous; what is the relationship between the number of loci and number of phenotypic classes?
Increase # loci = increase # of phenotypes
Because continuous characteristics are so complex statistics are used to analyze them.
4. What is the major difference between a population and a sample?
Population- the whole group being studied
Sample-a small selected group out of the population, ideally the sample would be a representative of the population.
5. Define the following terms?
 - a. Correlation: comparing the two, the relatedness *not cause and effect* (represented by the value r) (r indicates positive or negative and strength)
 - b. Regression: a prediction of one variable when knowing the other variable using the line of regression or the best fit line.
 - c. Variance: how stretched or squeezed the distribution is.
 - d. Standard deviation: how much variance there is from the average (sqrt of variance)
 - e. Mean: the average
6. What is the difference between the correlation coefficient and the regression coefficient?
Correlation coefficient- measures the strength of their association, how dispersed the data points are around the regression line.
Regression coefficient- slope of the regression line.
7. Draw the graphs associated with a normal distribution curve and a threshold distribution curve.



8. Highlight the differences between linkage study and an association study? Which method is more powerful?
 - Linkage study- looks at physical segments of the genome that are associated with given traits. “Is there an associated between pieces of the DNA and a trait of interest?”
 - How we map QLTs (Quantitative Locus Traits).
 - Association study- goes from the other direction. Look at segments of genome and then the traits associated with those segments. “What are the differences we see? In order to find differences in the traits, particularly diseased traits”
 - More Powerful!
9. Important formulas:
 - Phenotypic Variance
 - Phenotypic variance: $V_P(\text{phenotype}) = V_G(\text{Genetics}) + V_E(\text{Environmental}) + V_{GE}(\text{Both})$
 - Genetic Variance: $V_G(\text{Genetic}) = V_A(\text{Additive Genetic Variance}) + V_D(\text{Dominance}) + V_I(\text{Genic interaction})$
 - Combined formula: $V_P = V_A + V_D + V_I + V_E + V_{GE}$
 - Types of Heritability
 - Broad-Sense: $H^2 = V_G/V_P$
 - Narrow-Sense: $h^2 = V_A/V_P$