

Outline

sex chromosomes; sex linked inheritance

pedigree analysis

- autosomal
- sex-linked



XY males



XY females (ZW)



environment



multiple sex chromosomes

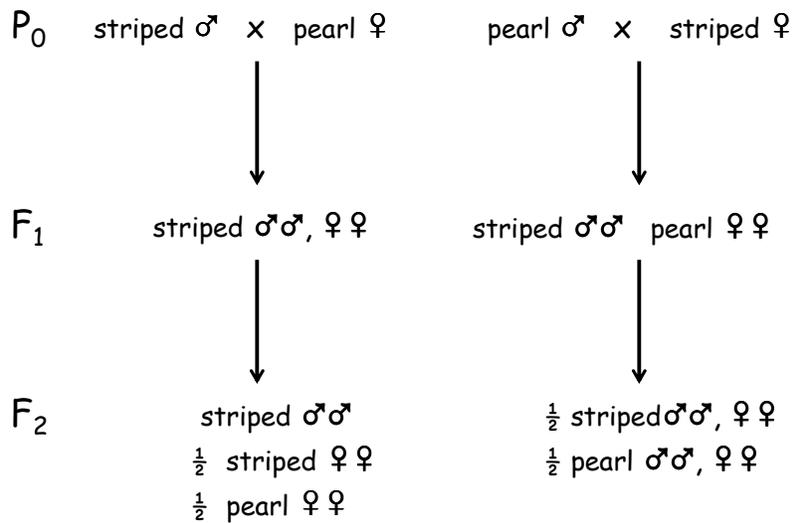
Inheritance of plumage pattern in budgerigars

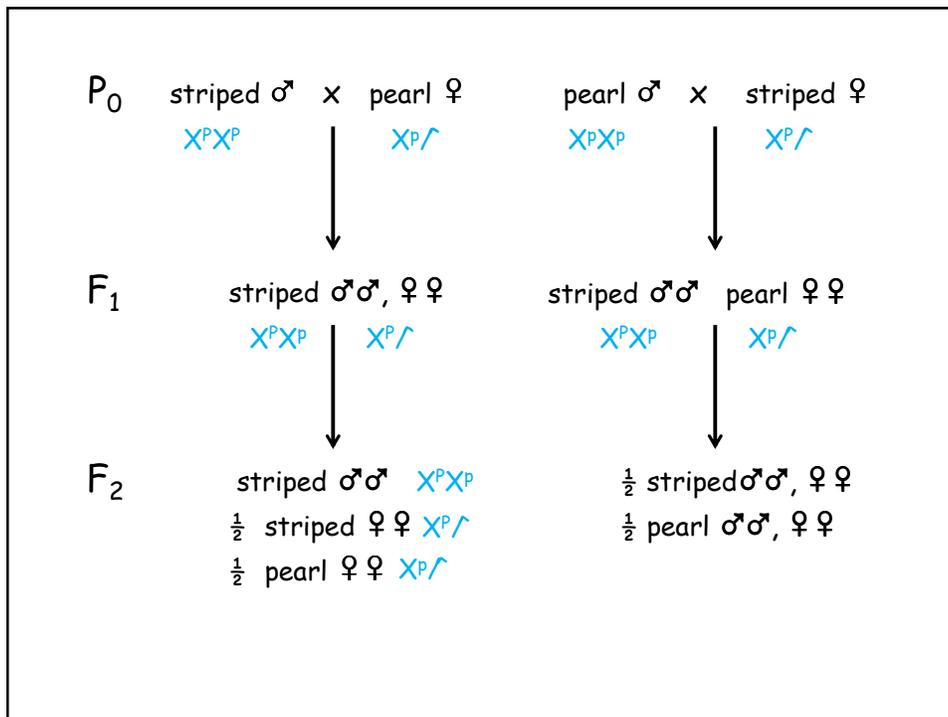


typical = striped



pearl





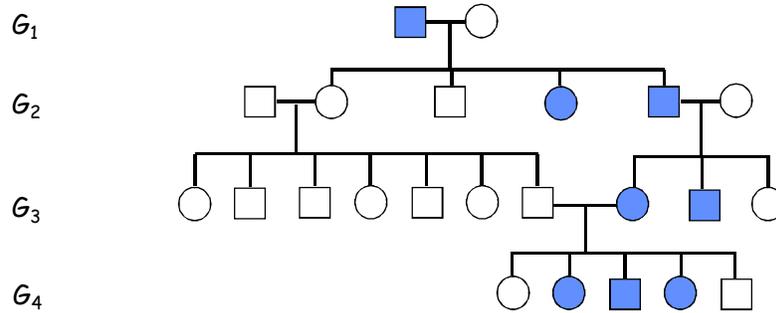
Pedigree Analysis

crosses not always possible

- generation time
- number of offspring

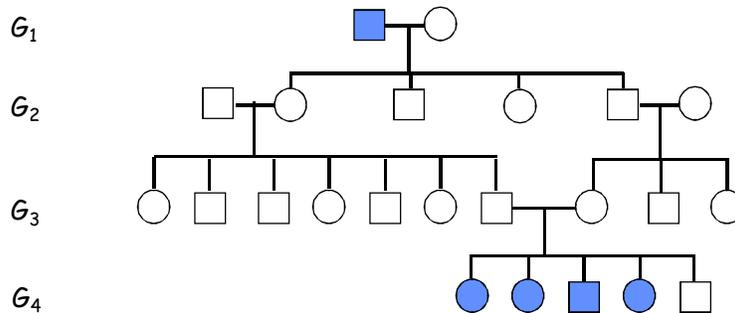
pedigrees

- pattern of inheritance across generations
- similar pattern in different pedigrees
- can't use ratios



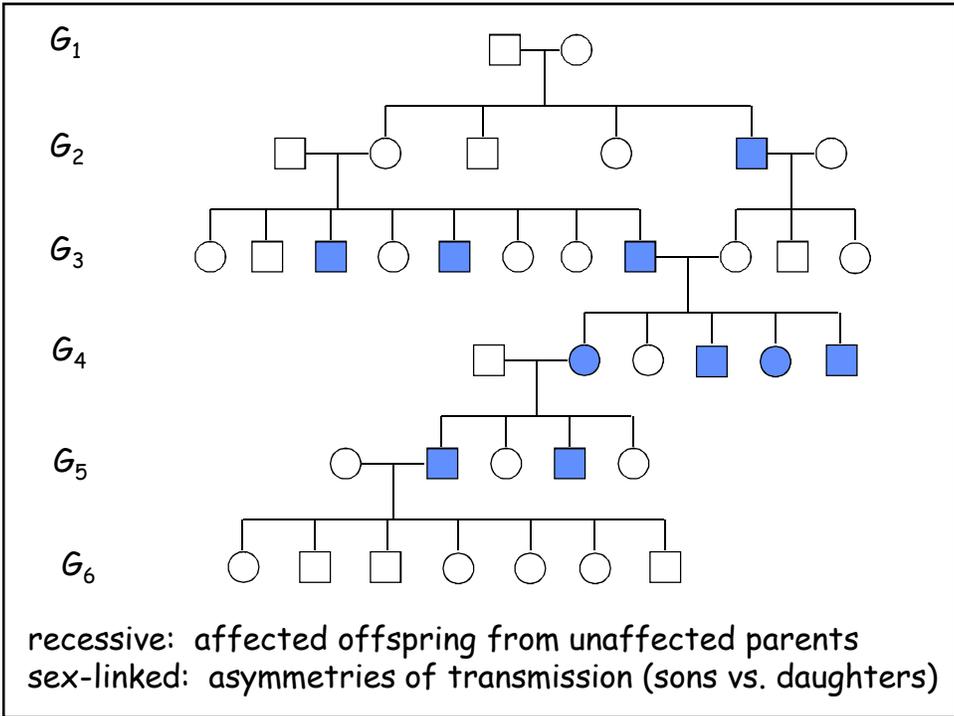
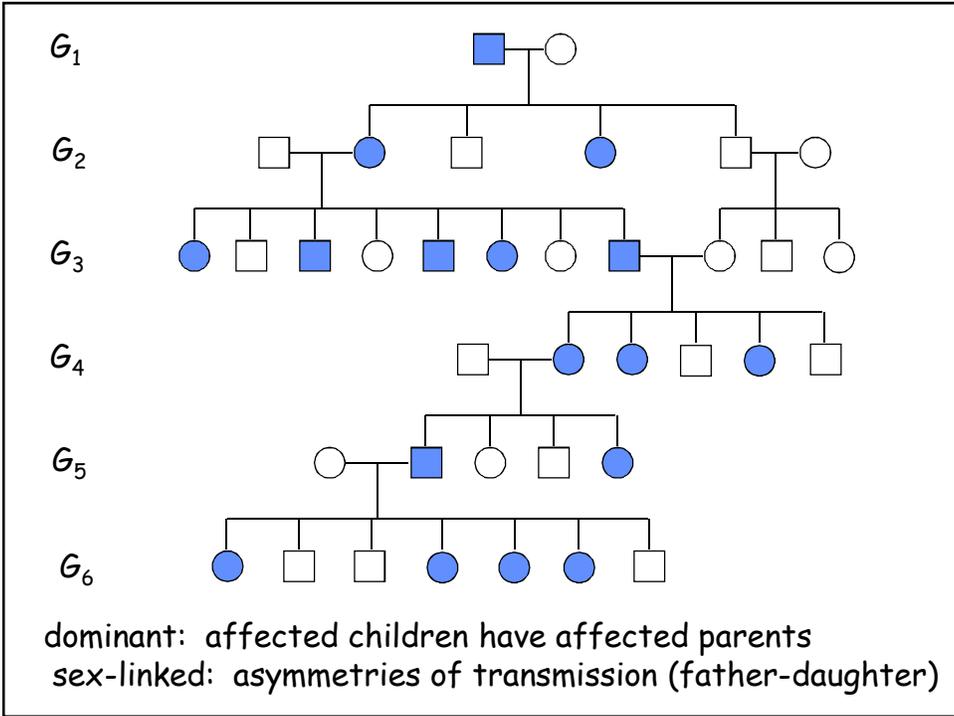
dominant trait

- present in every generation
- affected offspring have affected parents*



recessive trait

- may skip one or more generations
- affected offspring from unaffected parents



Genetic Dissection of Traits with Discrete Character States

--- reciprocal crosses of homozygous strains
or many crosses of unknown genotype

informative phenotypic ratios

1:0

3:1

--- use F_1 to determine dominant / recessive phenotypes

--- use F_2 to determine #/alleles / locus,
#loci / trait
and confirm F_1 inferences

1 homework problem on web

Take home points

sex chromosomes (X, Y) are homologous chromosomes that contain genes which determine whether an individual is male or female

genes on the X-chromosome are inherited differently from those on autosomes

sex-linkage is indicated when male and female offspring do not have the same phenotypic ratio; the sex displaying the recessive phenotype carries only one X-chromosome

the pattern of inheritance of a trait can be determined by:
-reciprocal crosses of homozygous lines and their offspring
-analysis of many crosses with parents of unknown genotype
-pedigrees