Interaction of non-allelic genes

In some cases there is a trait made up of more genes. This causes a **discrepancy in segregation ratios**. Usually, many genetic textbooks propose interaction between two genes each with two alleles with complete dominance. Segregation ratios in F2 generations of all types of interactions are summarized in the table below.

	A-B-	A-bb	aaB-	aabb
Simple interaction	9	3	3	1
Dominant epistasis	12		3	1
Recessive epistasis	9	3	4	
Complementary factor	9	7		
Duplicate gene	15			1
Polymorphic gene	9	6		1
Inhibitory factor	13		3	

Dominant epistasis (12:3:1) sets up when dominant gene realize its potential regardless of recessive gene. Only when dominant gene has both alleles recessive then recessive gene can realize its phenotype.

On the contrary **recessive epistasis (9:3:4)** occurs when both recessive alleles of one gene produce uniform phenotype regardless of genotype of the second gene.

In **complementary factor (9:7)** when either of both genes is recessive homozygous, then it leads to an identical phenotype regardless of genotype of the other gene. To produce other phenotype, both genes have to have at least one dominant allele.

Polymorphic gene (9:6:1) sets up when both genes are responsible for producing same trait. Then genotype aabb does not produce anything, genotypes A-bb and aaB- produce a half of what A-B- produce. All in all, there is a cumulatory effect.

Duplicate gene (15:1) is similar to polymorphic gene but there is no cumulation when both genes have a dominant allele.

Inhibitory factor (13:3) happens when dominant genotype of one gene and recessive genotype of the other have same phenotype. In F2 generation we then receive two phenotype classes. One with genotypes A-B-, A-bb, aabb and second with genotypes aaB-.