

# Allelic Odds Ratio

WHAT IS THE RATIO of C/G alleles  
in THE NON-TASTERS vs THE TASTERS?

	CC	CG	GG
NO	9	4	1
YES	1	29	14

	C	G
N	22	6
Y	31	57

N	C/G	22/6
Y		31/57

$$\text{Allelic Odds} = \frac{22/6}{31/57} = \frac{366}{0.51} = 6.8$$

TRAIT	RSID	P	AIOR	LR	INC RISK
BITTER	713598	$6 \times 10^{-5}$	6.77	31	3.75 CC
ASP	4481887	0.11	.53	.202	1.5 AA
WAX	17822931	$1 \times 10^{-10}$	25	7	4 "D" TT
eye	7495174	$10^{-5}$	0	2.3	2.6 AA
LACT	4988235	$8 \times 10^{-4}$	9.2	3.9	1.69 GG

LIKELIHOOD RATIO - LIKELIHOOD OF

SEEING A GENOTYPE GIVEN THE TRAIT COMPARED  
TO THE LIKELIHOOD OF SEE THE GENOTYPE  
GIVEN NO TRAIT.

BITTER

	CC	Cc/GG
No	9	5
Yes	1	43

$$P(CC | No) = \frac{9}{14} = .64$$

$$P(CC | Yes) = \frac{1}{44} = .02$$

	CC	Cc/GG
No	9	5
Yes	1	43

$$LR = \frac{.64}{.02} = 31$$

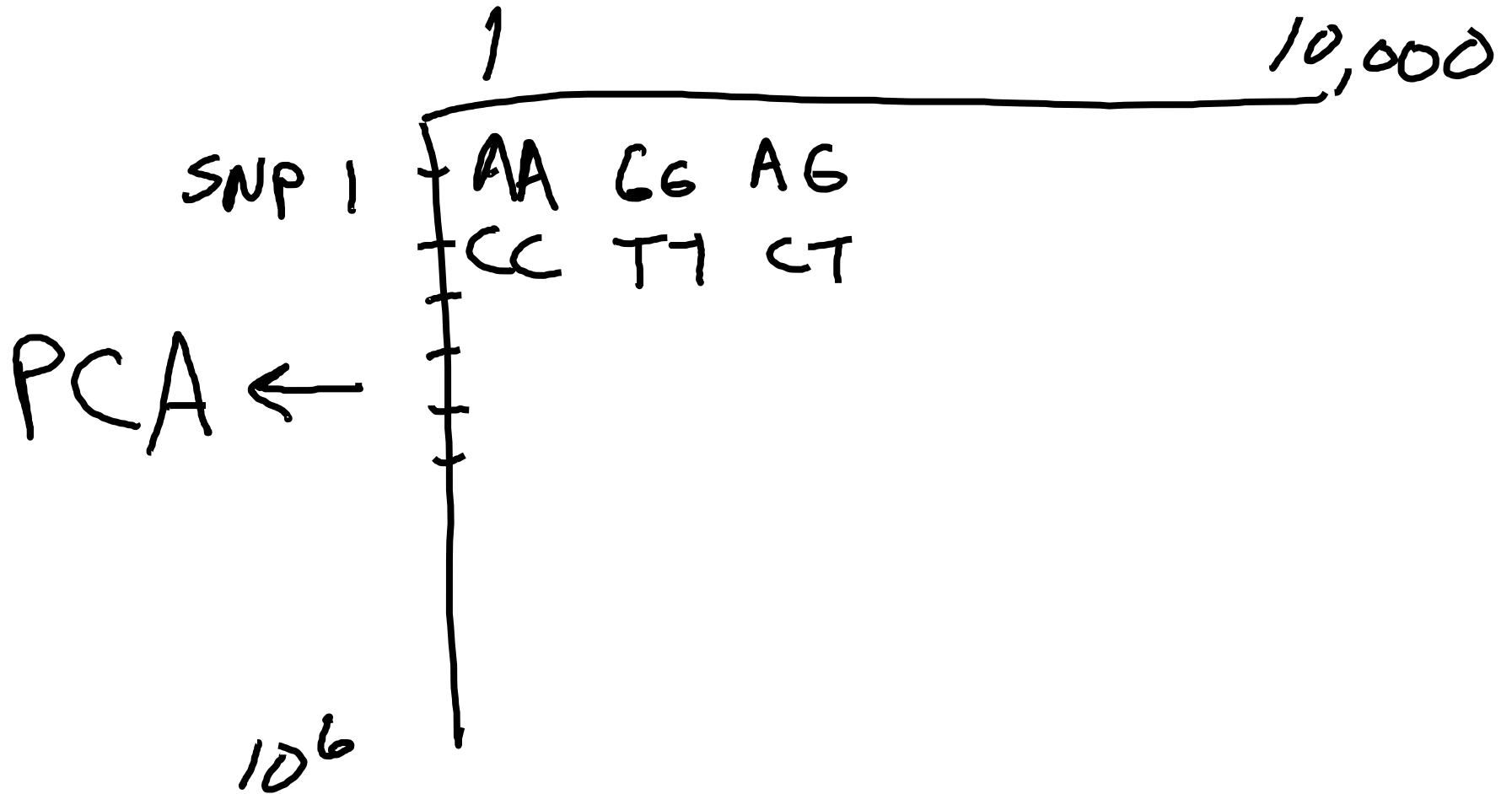
INCREASED RISK - WHAT IS THE  
 LIKELIHOOD OF SEEING A TRAIT GIVE A GENOTYPE  
 COMPARED TO THE OVERALL LIKELIHOOD OF SEEING  
 THE TRAIT IN THE POPULATION.

CC - NO BITTER TASTE

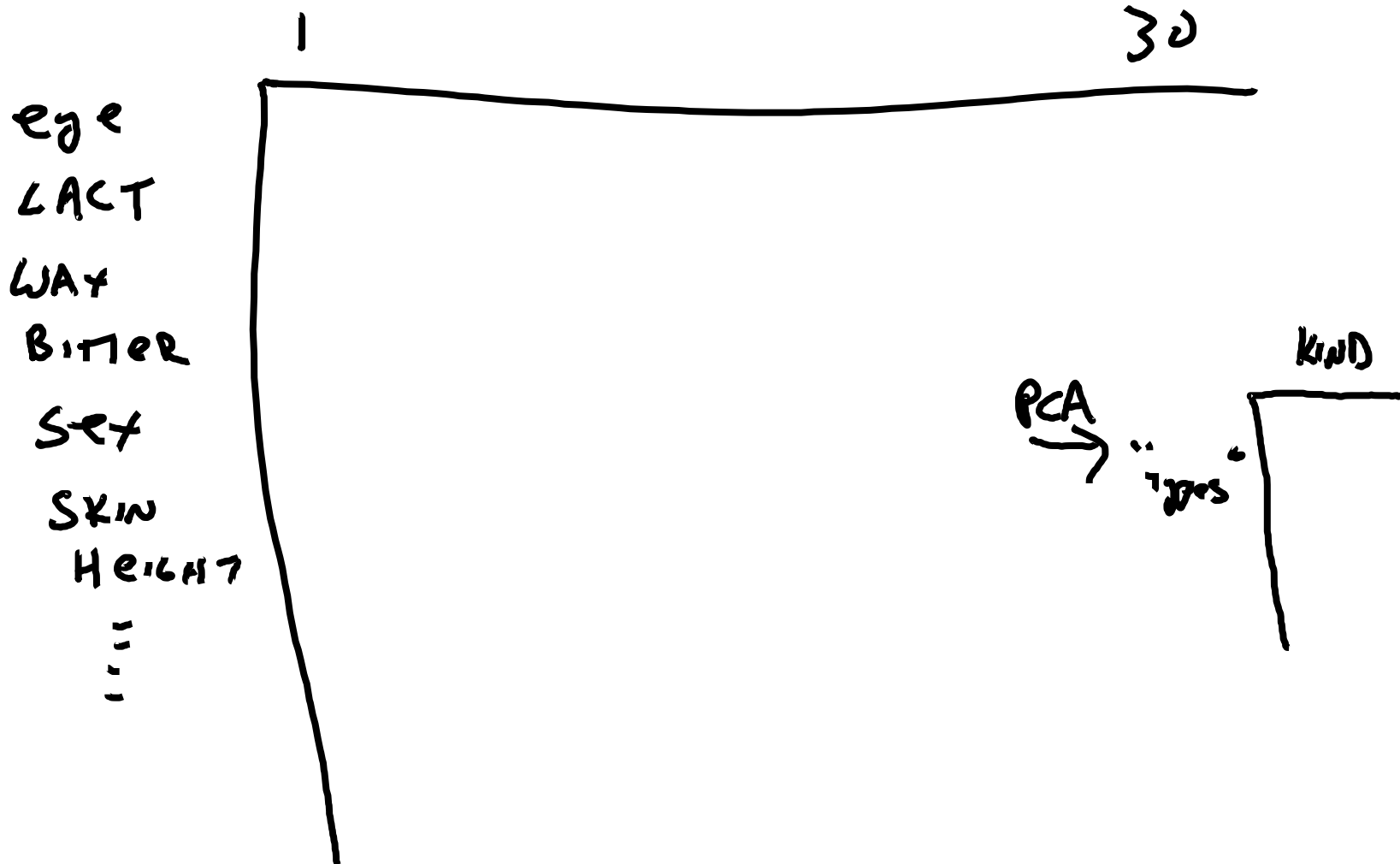
$$\frac{\text{CC } 9/10}{\text{POP } 14/58} = \frac{0.9}{0.24} = 3.75$$

	CC	Cc/Gc
N	9	5
y	1	43

# Ancestry Analysis



# Classify students



# Informative traits

INFORMATIVE

SKIN COLOR

eye color

HEIGHT

WEIGHT

SEX

LENGTH of HAIR

LESS INFORMATIVE

SHIRT COLOR

LENGTH of FINGERNAIL

# Uninformative traits



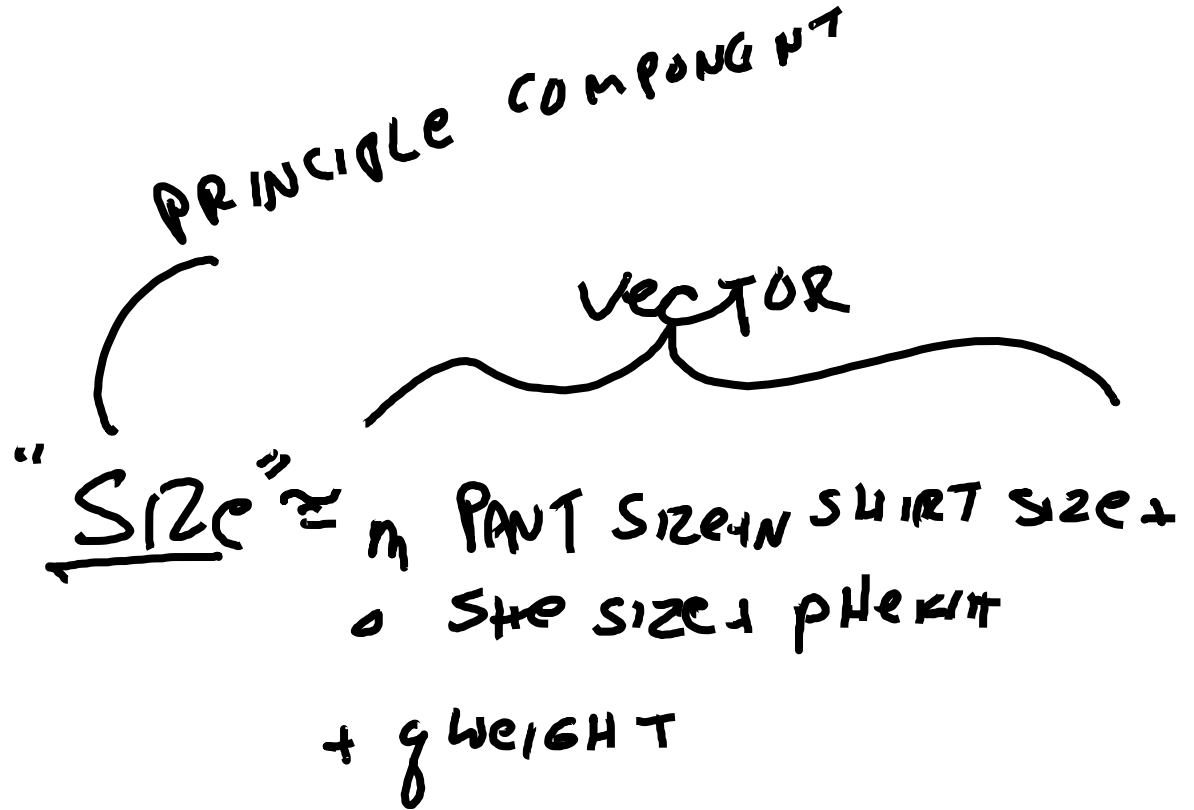
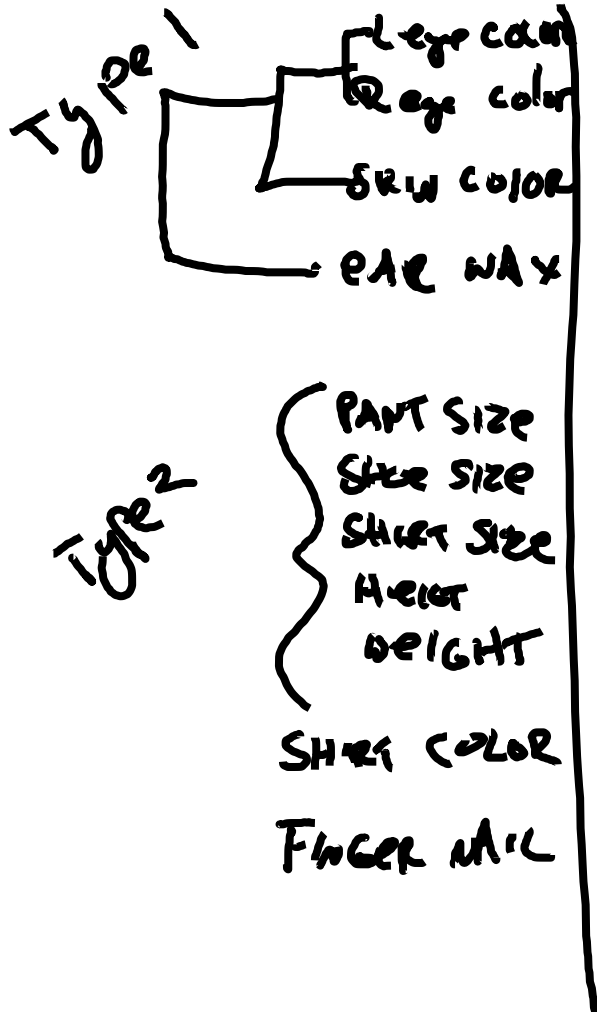
# DEPEND / Independence

{ L eye color  
R eye color

{ PANT SIZE - SHIRT SIZE  
HEIGHT - WEIGHT

eye color - ear wax

# Principle Components



# Ancestry Analysis

	<b>1</b>	<b>2</b>	<b>3</b>	<b>4</b>	<b>5</b>	<b>6</b>	<b>7</b>
Snp1	A	A	A	A	A	A	T
Snp2	G	G	G	G	G	G	G
Snp3	A	A	A	A	A	A	T
Snp4	C	C	C	T	T	T	T
Snp5	A	A	A	A	A	A	G
Snp6	G	G	G	A	A	A	A
Snp7	C	C	C	C	C	C	A
Snp8	T	T	T	G	G	G	G
Snp9	G	G	G	G	G	G	T
Snp10	A	G	C	T	A	G	C
Snp11	T	T	T	T	T	T	C
Snp12	G	C	T	A	A	G	C

# Ancestry Analysis

	1	2	3	4	5	6	7
<b>Snp1</b>	A	A	A	A	A	A	T
<b>Snp3</b>	A	A	A	A	A	A	T
<b>Snp5</b>	A	A	A	A	A	A	G
<b>Snp7</b>	C	C	C	C	C	C	A
<b>Snp9</b>	G	G	G	G	G	G	T
<b>Snp11</b>	T	T	T	T	T	T	C
Snp2	G	G	G	G	G	G	G
Snp4	C	C	C	T	T	T	T
Snp6	G	G	G	A	A	A	A
Snp8	T	T	T	G	G	G	G
Snp10	A	G	C	T	A	G	C
Snp12	G	C	T	A	A	G	C

# Ancestry Analysis

	1	2	3	4	5	6	7
<b>Snp1</b>	A	A	A	A	A	A	T
<b>Snp3</b>	A	A	A	A	A	A	T
<b>Snp5</b>	A	A	A	A	A	A	G
<b>Snp7</b>	C	C	C	C	C	C	A
<b>Snp9</b>	G	G	G	G	G	G	T
<b>Snp11</b>	T	T	T	T	T	T	C
<b>Snp4</b>	C	C	C	T	T	T	T
<b>Snp6</b>	G	G	G	A	A	A	A
<b>Snp8</b>	T	T	T	G	G	G	G
Snp2	G	G	G	G	G	G	G
Snp10	A	G	C	T	A	G	C
Snp12	G	C	T	A	A	G	C

# Ancestry Analysis

	1	2	3	4	5	6	7
Snp1	A	A	A	A	A	A	T
Snp3	A	A	A	A	A	A	T
Snp5	A	A	A	A	A	A	G
Snp7	C	C	C	C	C	C	A
Snp9	G	G	G	G	G	G	T
Snp11	T	T	T	T	T	T	C

	1-6	7
Snp1	A	T
Snp3	A	T
Snp5	A	G
Snp7	C	A
Snp9	G	T
Snp11	T	C

	1
Snp1	A
Snp3	A
Snp5	A
Snp7	C
Snp9	G
Snp11	T

= X

	7
Snp1	T
Snp3	T
Snp5	G
Snp7	A
Snp9	T
Snp11	C

X

# Ancestry Analysis

	1	2	3	4	5	6	7
Snp1	A	A	A	A	A	A	T
Snp3	A	A	A	A	A	A	T
Snp5	A	A	A	A	A	A	G
Snp7	C	C	C	C	C	C	A
Snp9	G	G	G	G	G	G	T
Snp11	T	T	T	T	T	T	C

	M	N
PC1	X	x

# Ancestry Analysis

	1	2	3	4	5	6	7
Snp4	C	C	C	T	T	T	T
Snp6	G	G	G	A	A	A	A
Snp8	T	T	T	G	G	G	G

	1-3	4-7
Snp4	C	T
Snp6	G	A
Snp8	T	G

	1-3
Snp4	C
Snp6	G
Snp8	T

Y

	4-7
Snp4	T
Snp6	A
Snp8	G

y

	1-3	4-7
PC2	Y	y



# Ancestry Analysis

	1	2	3	4	5	6	7
<b>PC1</b>	X	X	X	X	X	X	x
<b>PC2</b>	Y	Y	Y	y	y	y	y
Snp2	G	G	G	G	G	G	G
Snp10	A	G	C	T	A	G	C
Snp12	G	C	T	A	A	G	C

	1-3	4-6	7
<b>PC1</b>	X	X	x
<b>PC2</b>	Y	y	y
Snp2	G	G	G
Snp10	A	T	C
Snp12	G	A	C

	1-3	4-6	7
PC1	X	X	x
PC2	Y	y	y
Snp2	G	G	G
Snp10	A	T	C
Snp12	G	A	C

