

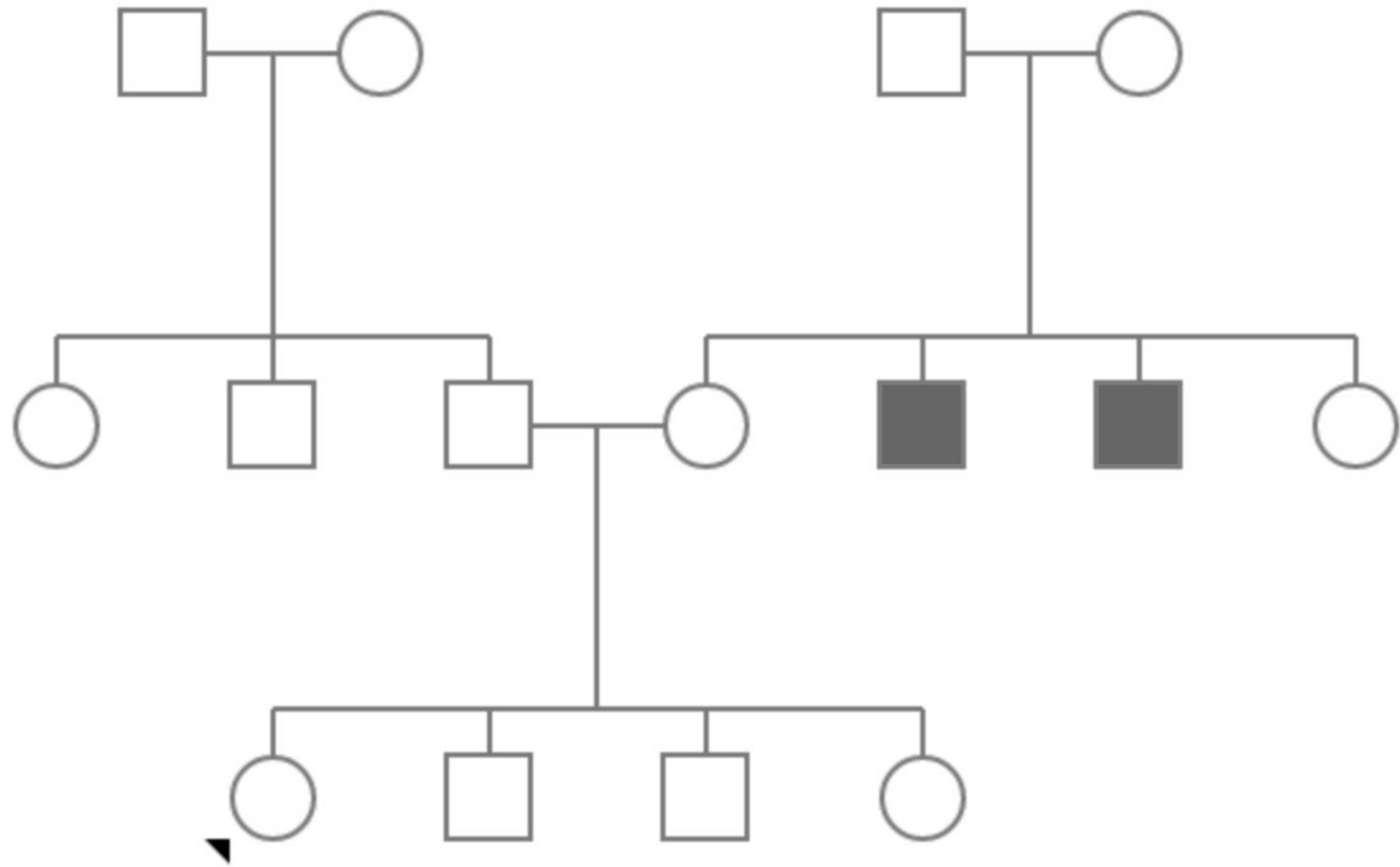
A self-study of my child's genetic risk

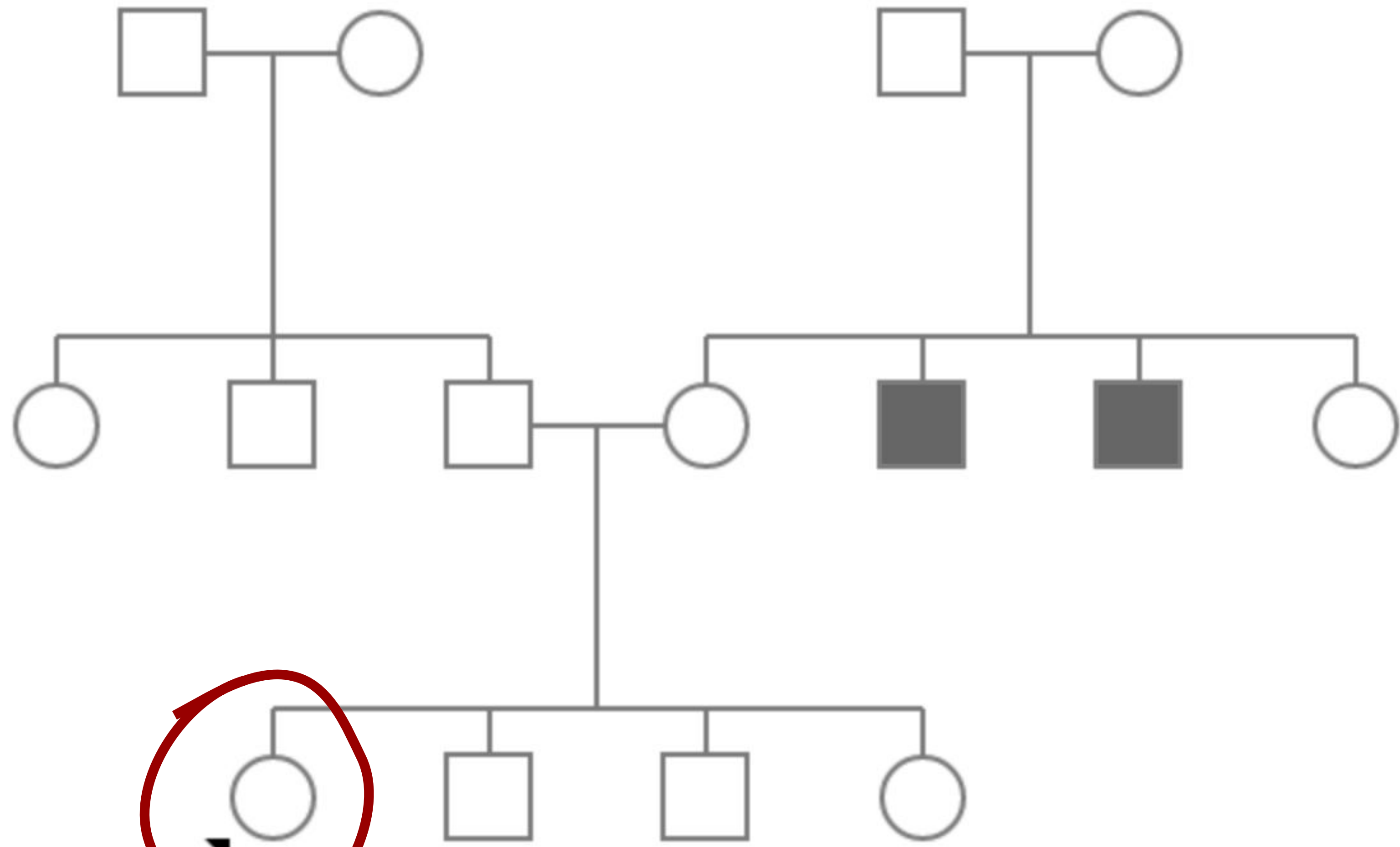
Using 23andMe data to get an accurate prediction.

Mad Price Ball
@madprime

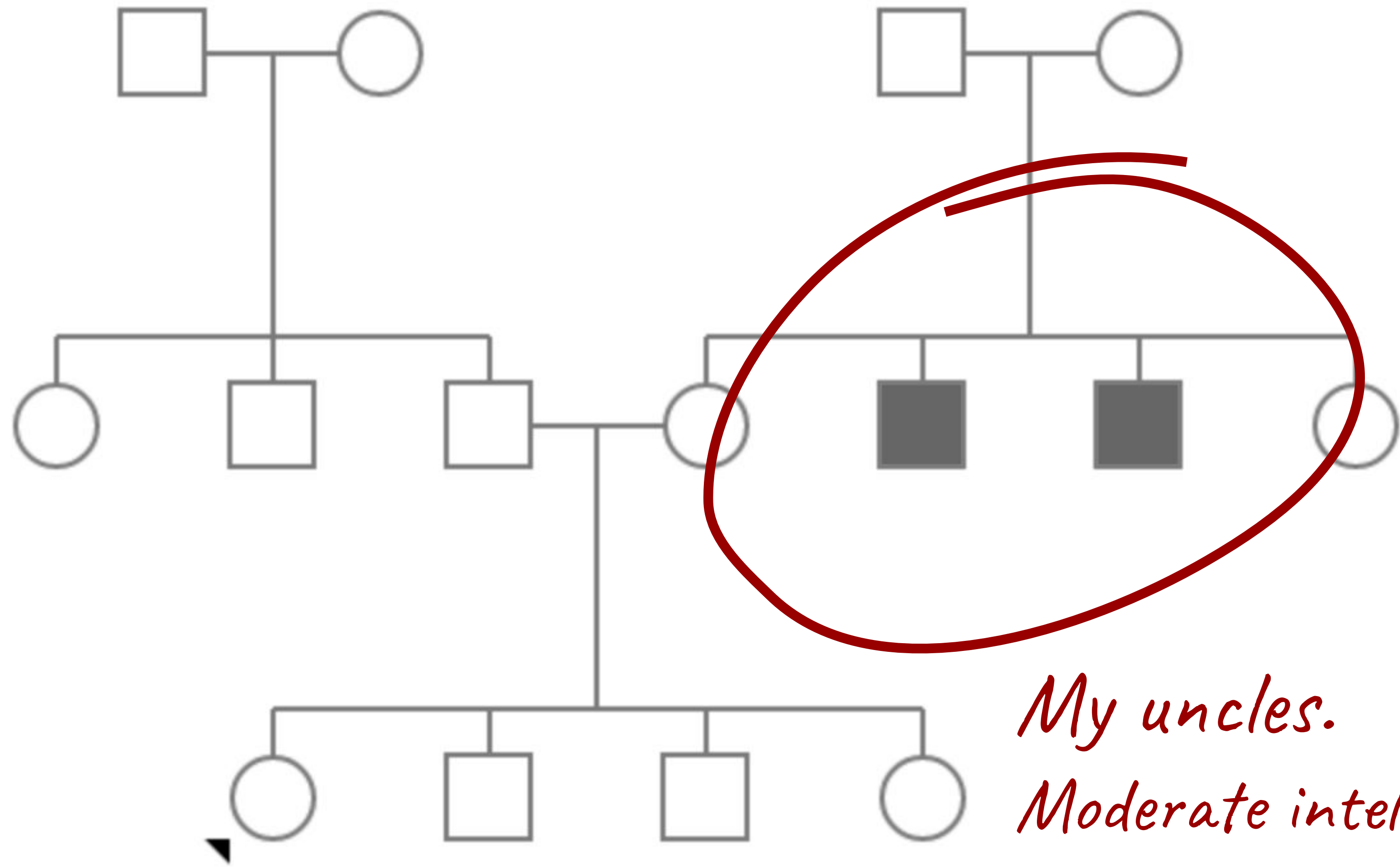
(day job @ Open Humans)



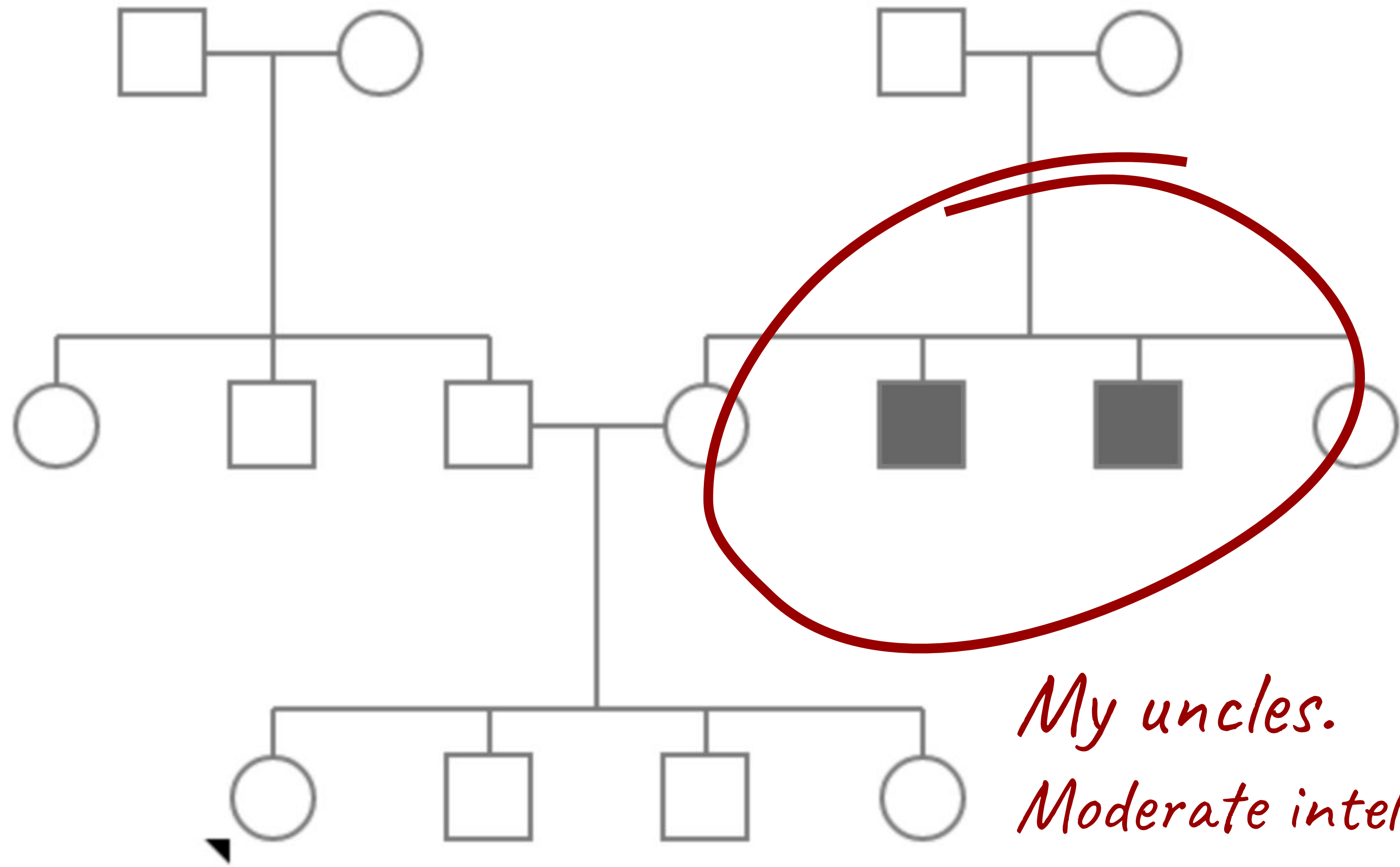




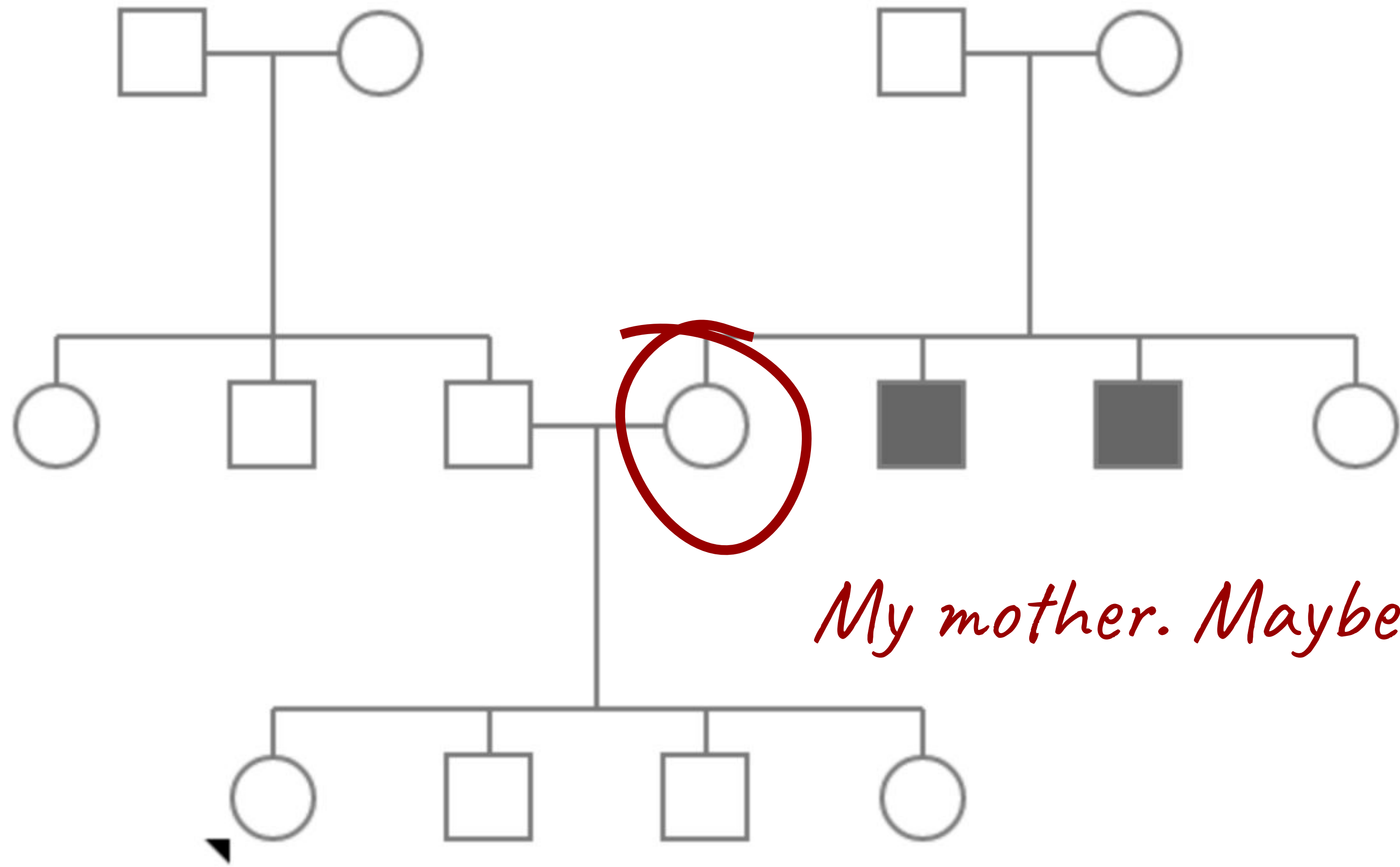
Me



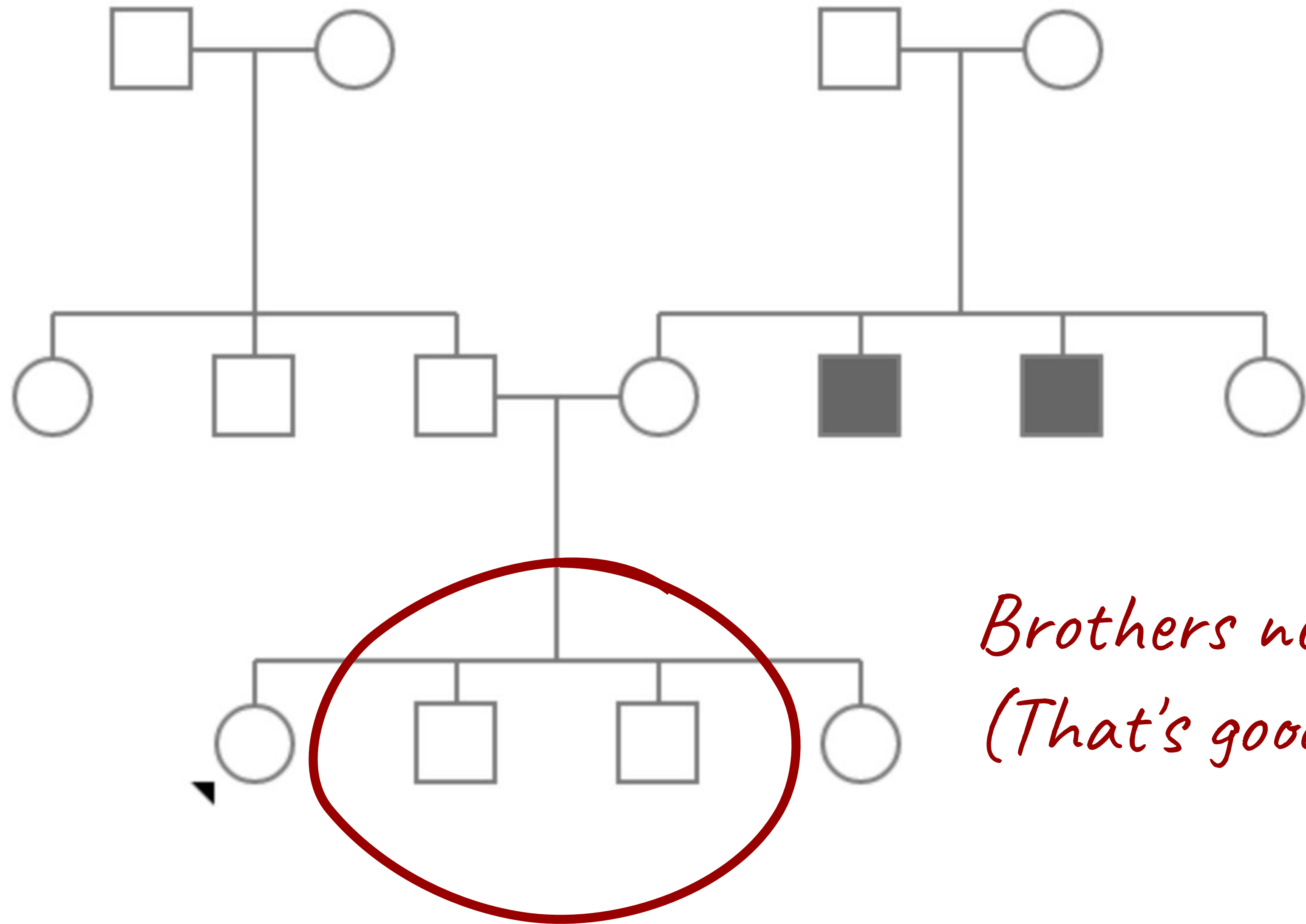
*My uncles.
Moderate intellectual disability.*



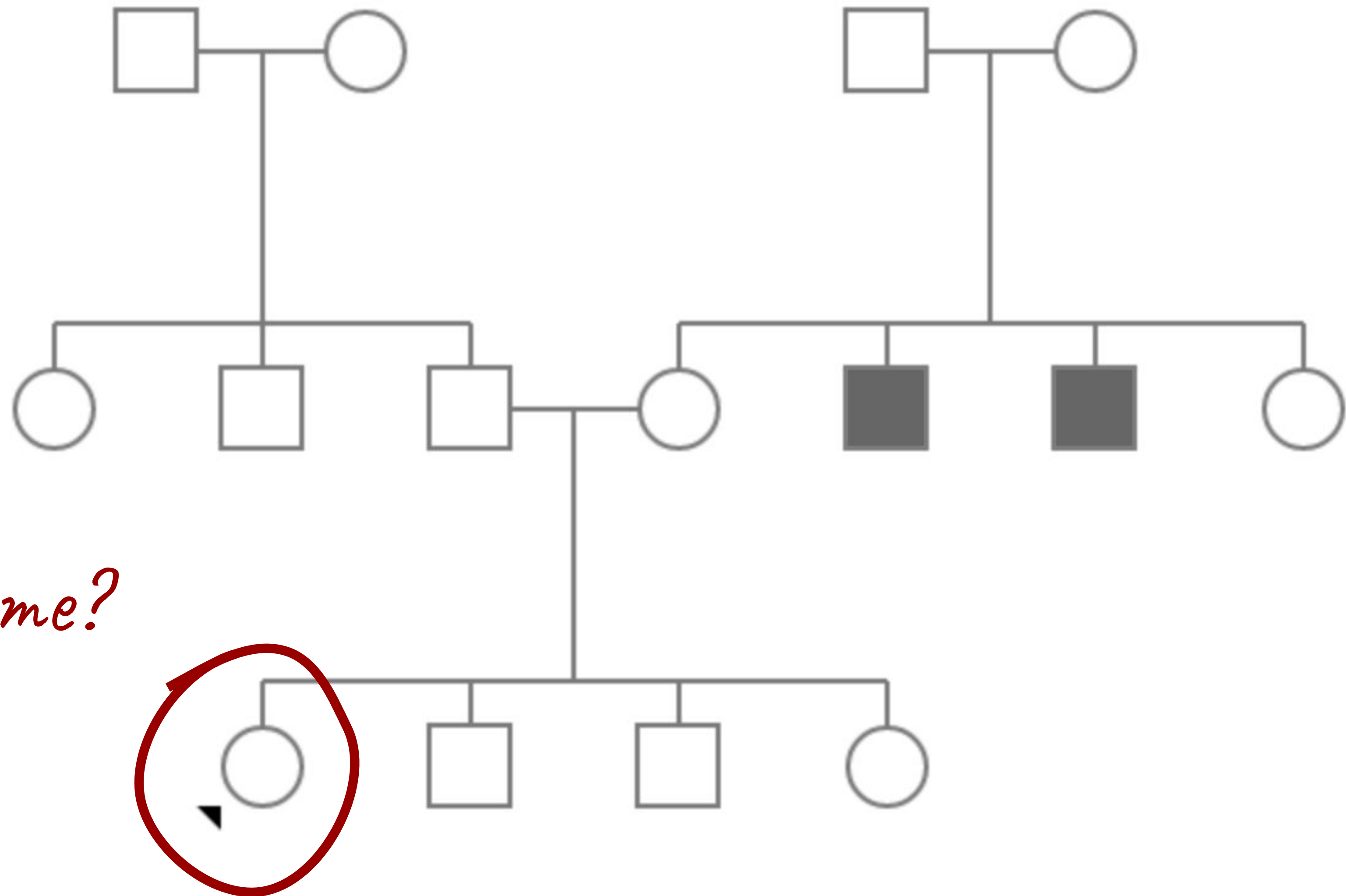
*My uncles.
Moderate intellectual disability.
X-linked?*



My mother. Maybe a carrier?



*Brothers not affected.
(That's good...)*

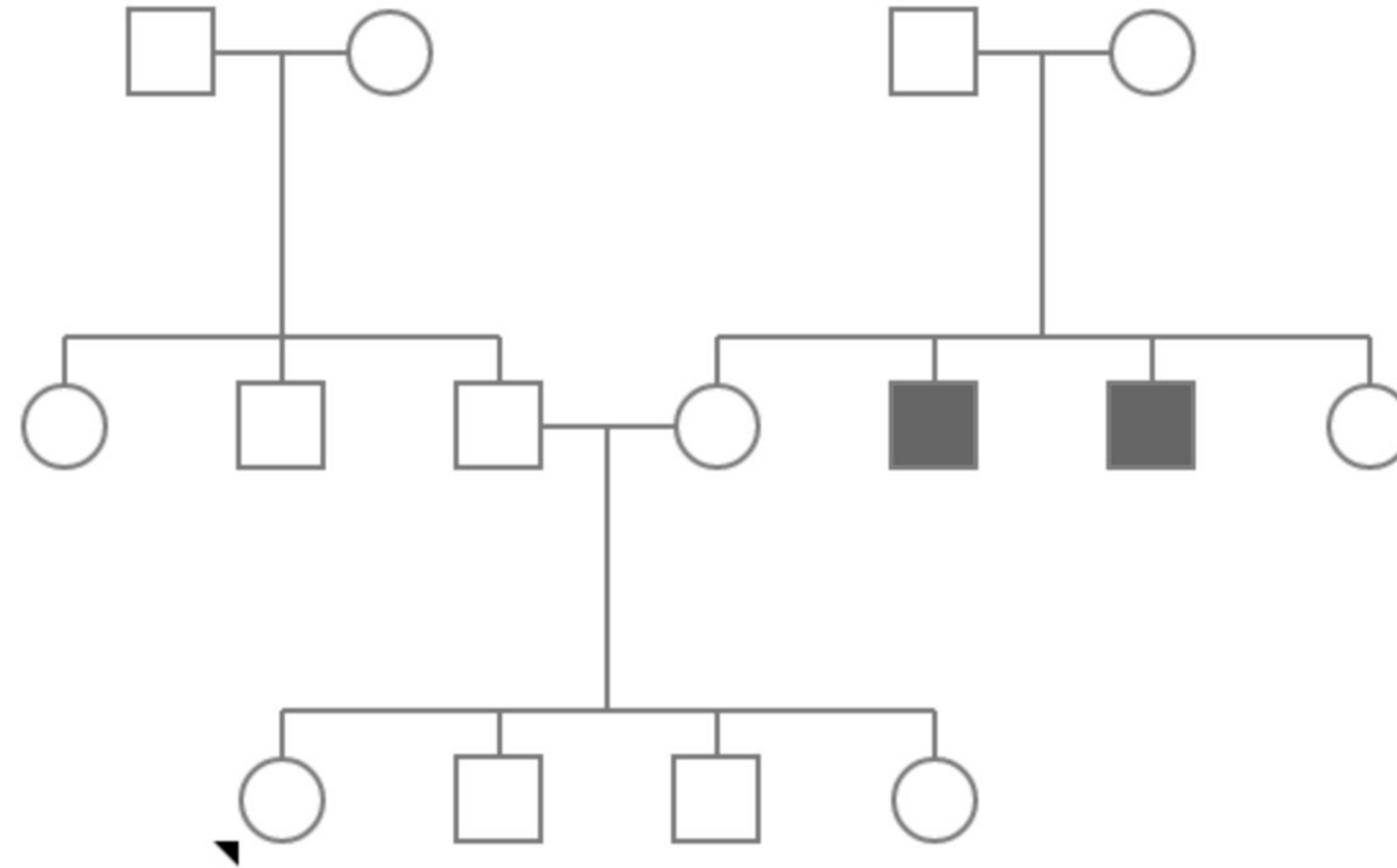


What about me?

Traditional genetic tests: negative.

Inconclusive

$$P(A | B) = \frac{P(B | A) P(A)}{P(B)}$$



$p(\text{ Mom carrier } | \text{ unaffected sons })$

$= p(\text{ unaffected sons } | \text{ Mom is carrier }) * p(\text{ Mom is carrier }) / p(\text{ unaffected sons })$

$= 0.25 * 0.5 / (0.25 * 0.5 + 1.0 * 0.5)$

$= 0.2$

$p(\text{ Mom carrier }) = 20\%$

$p(\text{ I am carrier }) = 10\%$

$p(\text{ son inherits }) = 5\%$

I realized we had more data.

23andMe.

First, a little about my X chromosomes.

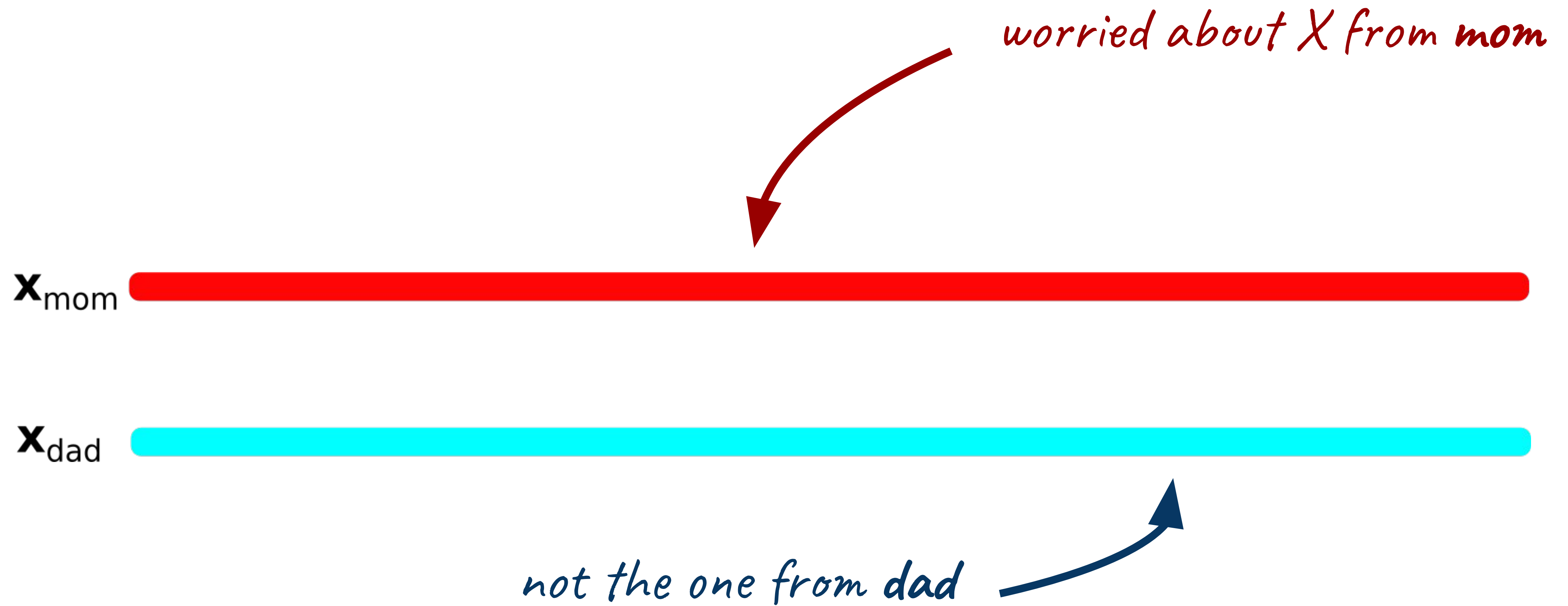
X_{mom}



X_{dad}



I'm worried about the X from mom.

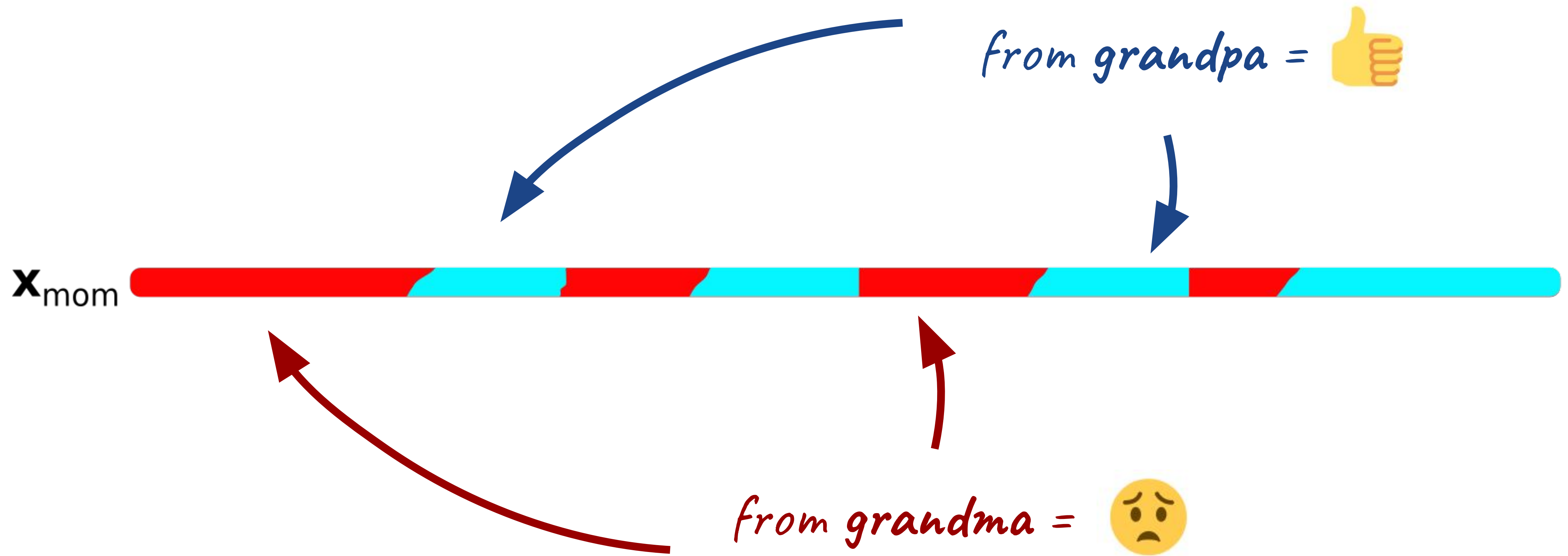


Mom's chromosome is a mix.

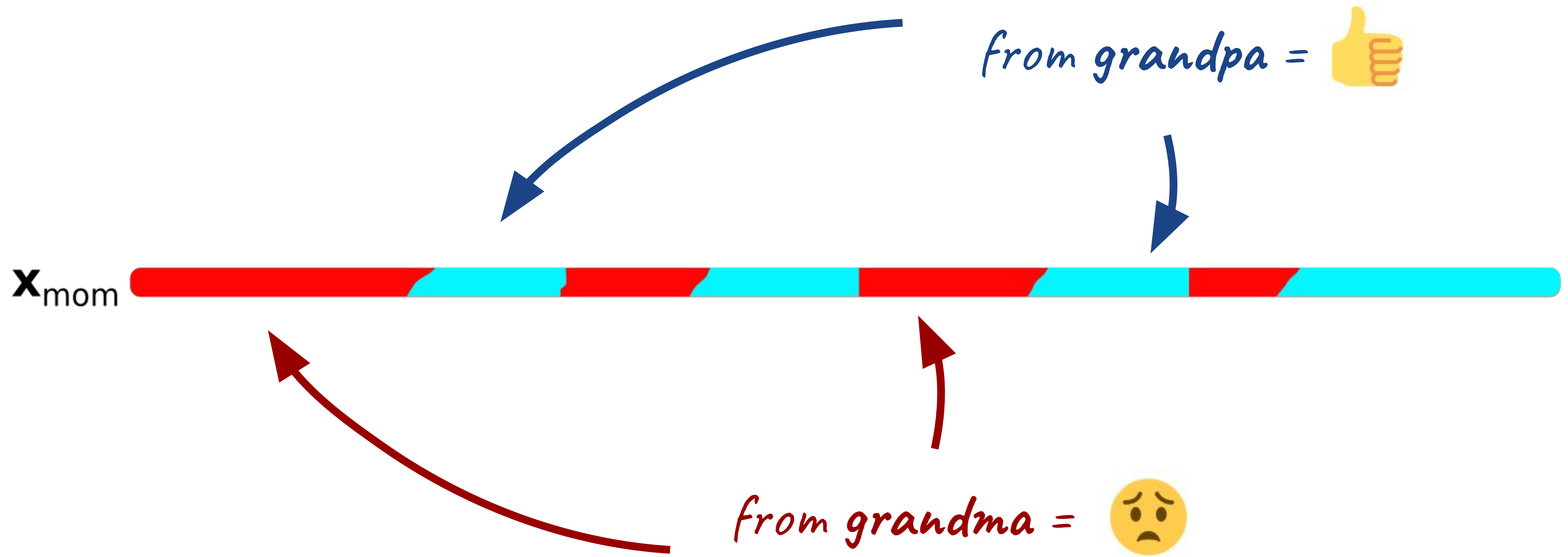
x_{mom}



I'm worried about X from grandma.



I'm worried about X from grandma.



(Uncles got X from grandma.)

This chromosome is hypothetical.

X_{mom}



I used 23andMe to compare my data to my grandfather.



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[View all DNA Relatives](#)

Compare your DNA with close and distant relatives

Identical or overlapping DNA segments indicate a common ancestor and can help identify relationships across multiple relatives. [Learn more about how to use this tool.](#)

Compare




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With

Select another relative to compare with.









Compare

Select from your connections and your DNA Relatives

 Grandfather

Me vs. Maternal Grandfather

Detailed segment data

Comparison	Chrom.	Start Position	End Position	Genetic Distance (cM)	Number of SNPs	Identity
Mad Price Ball / 	1	106508601	249210707	153.21	23855	Half
Mad Price Ball / 	1	1	57665932	82.03	10512	Half
Mad Price Ball / 	2	1	33623306	57.34	7263	Half
Mad Price Ball / 	2	114117512	142385883	27.12	5332	Half
Mad Price Ball / 	3	127484757	188654798	66.77	11471	Half
Mad Price Ball / 	3	39809870	88978538	46.40	9255	Half
Mad Price Ball / 	4	80959926	146867376	56.88	11194	Half
Mad Price Ball / 	4	1	39458591	61.80	8250	Half

Me vs. Maternal Grandfather



Me vs. Maternal Grandfather

X



X



This hasn't helped much yet!

X



I compared my brother to my grandfather.



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Mad Price Ball

Brother vs. Maternal Grandfather

x



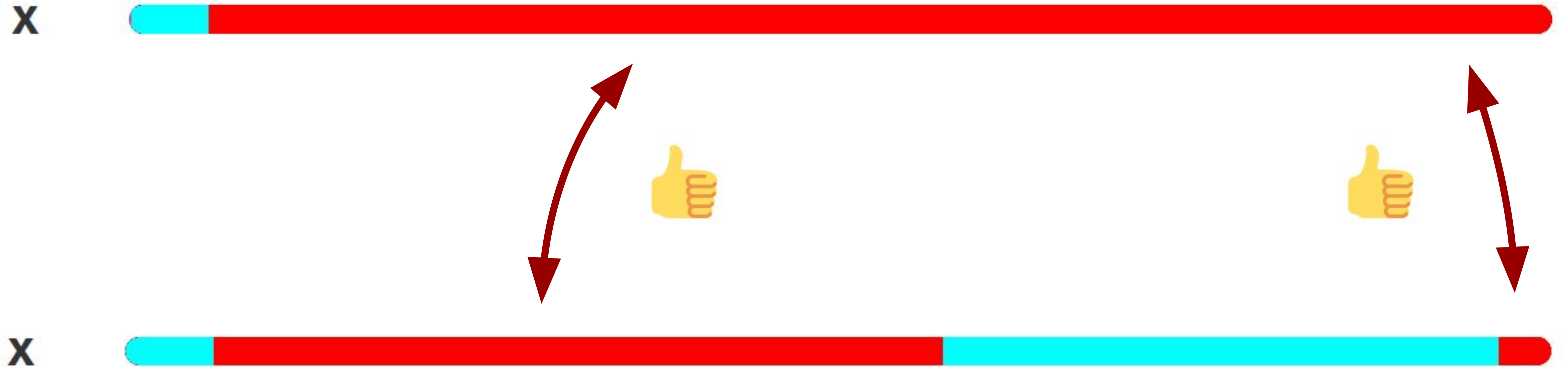
Brother vs. Maternal Grandfather

Safe!

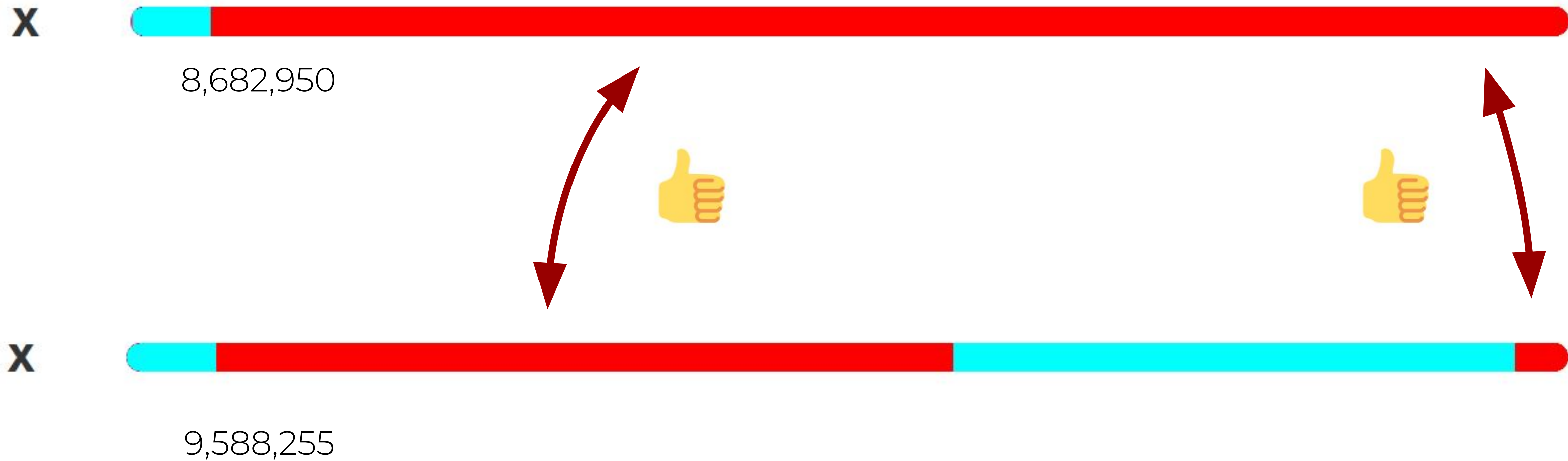
x



My brother's X vs. Mine shows I'm safe.



My brother's X vs. Mine shows I'm safe.



What I learned

What I learned

I ruled out being a carrier of this hypothetical X-linked disease.

What I learned

Having data about ourselves can matter a lot,

What I learned

Having data about ourselves can matter a lot,
and in unexpected ways.

What I learned

Having data about ourselves can matter a lot,
and in unexpected ways.

We might need to compare it to others.

Mad Price Ball

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(Open Humans Foundation, Executive Director)

Breakout & Office Hours

What Are My Data Rights? Saturday Session 2 (12-1pm)

Open Humans Office Hours Sunday Lunch (1-2pm)