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A copy of my PowerPoint slides for this presentation may be downloaded from http://tinyurl.com/zsukg8d. To provide an example of a complicated genealogical research question that was solved using autosomal DNA analysis I would like to review the data I used and the analysis I did to as part of my Youngman DNA project.

For over 30 years I had been trying to establish the ancestry of my great great great grandfather Jacob Youngman (b. ca Aug 1823, d. 24 May 1903). No one in our family knew his ancestry, but his son Charles Youngman (b. 1872) left a tantalizing clue in his biography that was published in the book "History of Harrison County, Missouri" where Charles Youngman said that Jacob Youngman's father lived in Kentucky, moved to Indiana where he entered land, and later moved to central Missouri where he died. Not too many Youngmans fit this description. In 2011 I began focusing on a John Youngman (b. ca 1793) who is listed in the 1840 Census in Clay County, Missouri, but is not listed there in the 1850 Census. A William Youngman (b. ca 1818) appears in nearby Ray County, Missouri in the 1850 Census, so I assumed that John Youngman must have died between 1840 and 1850. In the fall of 2011 I learned that John Youngman didn't die prior to 1850, but instead moved to Denton County, Texas where he is listed in the 1850 Census with his family. Meanwhile, my ancestor Jacob Youngman is listed in Shelby Co., Indiana in the 1850 Census. This genealogical puzzle is complicated by the fact that John Youngman appears to have been married 3 times and was divorced from his first two wives. He had children by all three wives with Jacob Youngman seeming to be his son by his second wife Elizabeth Reeves. I was able to establish contact with another Youngman researcher, Susie Brewer, whose husband is a great great grandson of Mary Jane Youngman (b. Nov 1835), who appears to be a half-sister to Jacob Youngman (b. ca Aug 1823), being a daughter of John Youngman's third wife Priscilla Clark.

The key evidence to solving this genealogical puzzle has come from autosomal DNA testing. Susie Brewer was able to get a DNA sample from G. B.'s first cousin once removed T. M.. T. M. is a great grandson of Mary Jane Youngman. We also have DNA results from two great great grandsons of William Youngman (b. ca 1818), specifically J. Y. and L. Y.. A total of 4 great grandchildren of Jacob Youngman (b. ca Aug 1823, d. 24 May 1903) have also been tested, specifically F. M., D. Y., M. B., and R. Y., as well as a group of 6 great great grandchildren of Jacob Youngman who have previously been tested. Below is a summary of the DNA data showing comparisons between these people and the totals of the cMs for their matching segments.

Comparison	4 cM threshold	5 cM threshold
F. M. and his 1/2 3rd cousin T. M.	16.2	12.1
R. Y. and his 1/2 3rd cousin T. M.	5.1	5.1
M. B. and her 1/2 3rd cousin T. M.	4.6	0
D. Y. and his 1/2 3rd cousin T. M.	72.4	67.9
N. Y. and his 1/2 3rd cousin T. M.	71.6	67.4

Average: 34.0 using a 4 cM threshold

Average: 30.5 using a 5 cM threshold

Expected amount if the relationship is ½ 3rd cousin: 27.5

T. M. and G. B. compared to various relatives as follows:

Comparison	4 cM threshold	5 cM threshold
Betty Janzen and her 1/2 3rd cousin once removed T. M.	11.2	11.2
Lawrence Youngman and his 1/2 3rd cousin once removed T. M.	16.3	11.4
Robert Youngman and his 1/2 3rd cousin once removed T. M.	21.5	21.5
J. W. and her 1/2 3rd cousin once removed T. M.	25.2	25.2
M. Y. and his 1/2 3rd cousin once removed T. M.	27.7	23.6
J. B. and her 1/2 3rd cousin once removed T. M.	23	10.1
G. B. and his 1/2 3rd cousin once removed F. M.	0	0
G. B. and his 1/2 3rd cousin once removed R. Y.	12.4	0
G. B. and his 1/2 3rd cousin once removed M. B.	10.8	10.8
G. B. and his 1/2 3rd cousin once removed D. Y.	5.1	5.1
G. B. and his 1/2 3rd cousin once removed N. Y.	17.3	0
Average	15.5	10.8

L. Y. and J. Y. compared to various relatives as follows:

Comparison	4 cM threshold	5 cM threshold
L. Y. and his 1/2 3rd cousin once removed F. M.	43.4	25.9
L. Y. and his 1/2 3rd cousin once removed R. Y.	17.2	0

L. Y. and his 1/2 3rd cousin once removed M. B.	29.2	24.5
L. Y. and his 1/2 3rd cousin once removed D. Y.	13.1	0
J. Y. and his 1/2 3rd cousin once removed F. M.	40.7	36.7
J. Y. and his 1/2 3rd cousin once removed R. Y.	16.4	11.7
J. Y. and his 1/2 3rd cousin once removed M. B.	11.6	6.6
J. Y. and his 1/2 3rd cousin once removed D. Y.	20.8	16.7
J. Y. and his 1/2 3rd cousin once removed N. Y.	8.7	0
Average	22.3	13.6

Average for the above two tables using a 5 cM threshold: 12.1 cM

Expected amount if the relationship is ½ 3rd cousin once removed: 13.7

The proper way to analyze this data is create an average for the relatives in my family at each level of genealogical relationship as I have done above. It is reasonable to assume that all of the matching segments over 5 cMs in length came from a shared common ancestor. The above averages when using the 5 cM threshold are supportive of my theory that T. M.'s great grandmother Mary Jane Youngman (b. ca 1836) was a 1/2 sibling to my mother's great great grandfather Jacob Youngman (b. ca Aug 1823). If Mary Jane Youngman and Jacob Youngman were full siblings this would make T. M. a 3rd cousin once removed to my mom. If Mary Jane Youngman and Jacob Youngman were half-siblings this would make T. M. a ½ 3rd cousin once removed to my mom. We know that ½ 3rd cousins should share 0.391% of their DNA in common, that ½ 3rd cousins once removed should share 0.195% of their DNA in common, and that ½ 4th cousins should share 0.0977% of their DNA in common. There are about 7098 cM of autosomal DNA in the entire genome as calculated by the company 23andMe. Thus we would expect that on average ½ 3rd cousins should share about 27.8 cMs in common with each other, ½ 3rd cousins once removed should share about 13.8 cMs of DNA in common with each other, and that ½ 4th cousins should share about 6.9 cMs in common with each other. We are seeing results that are very close to the expected average for the comparisons between T. M. and G. B. and my close Youngman relatives. Thus, I think that it is safe to say that the DNA data suggests that Mary Jane Youngman and Jacob Youngman were half-siblings based on this comparison. Similarly we are seeing results that are very close to the expected average for the comparisons between L. Y. and J. Y. and my close Youngman relatives. Thus, I think that it is safe to say that the DNA data suggests that William Youngman and Jacob Youngman were also half-siblings based on this comparison.

There are multiple resources for learning about the use of autosomal DNA testing for genealogical purposes. One basic resource I have created is a list of the primary autosomal DNA tests available for use by genetic genealogists which may be found at http://www.isogg.org/wiki/Autosomal_DNA_testing_comparison_chart. For a good overview of autosomal DNA use for genealogical purposes see http://www.isogg.org/wiki/Portal:Autosomal_DNA. In particular you need to become familiar with the statistical information http://www.isogg.org/wiki/Autosomal_DNA_statistics. Other key background information is found at http://www.isogg.org/wiki/Identical_by_descent where the concept of DNA that is identical by descent is discussed.

Genetic Genealogy Discussion E-mail Groups

RootsWeb Genealogy-DNA list http://archiver.rootsweb.com/th/index/GENEALOGY-DNA; active list with an average of about 400 messages per month

FTDNA http://forums.familytreedna.com; very active

ISOGG Newbies; about 350 messages per month http://groups.yahoo.com/group/DNA-NEWBIE

ISOGG list; about 300 messages per month http://groups.yahoo.com/group/ISOGG

23andMe Community; https://www.23andme.com

Genetic Genealogy Groups on FaceBook

ISOGG, DNA Detectives, The Institute for Genetic Genealogy, Autosomal DNA, DNAGEDCOM, DNA Tools, etc.

Books Pertaining to Genetic Genealogy

Trace Your Roots with DNA by Megan Smolenyak and Ann Turner, 2004.

DNA and Family History: How Genetic Testing Can Advance Your Genealogical Research by Chris Pomery, 2004.

Deep Ancestry by Spencer Wells, 2006.

DNA and Social Networking: A Guide to Genealogy in the Twenty-first Century, by Debbie Kennett and Chris Pomery, 2011.

Genetic Genealogy: The Basics and Beyond by Emily Aulicino, 2013.

NextGen Genealogy by David Dowell, 2014.