Understanding Matches

Just as there are surnames which are very common, (such as Smith and Jones), and surnames which are uncommon, there are Haplotypes (a set of results that characterize you on the Y-Chromosome) with a high frequency of occurrence (aka common), and Haplotypes with a low frequency of occurrence (aka uncommon). The 12 Marker result from the Y-chromosome test is called a Haplotype, and can help determine if your DNA sample is common or uncommon.

When you compare a 12 Marker result to another 12 marker result of someone with the SAME surname, and the results match 12/12, there is a 99% probability that you two are related within the time frame included in the MRCA tables (/learn/). If the match is 11/12, there's still a high probability that you are related IF the 11/12 match is within the same surname. If you compare a 25 Marker result to another 25 marker result for the SAME surname, and the results match 25/25, then there is also a 99% confidence that the two individuals are related...and at a much closer time interval than with the 12 marker test.

If you compare the 12 marker result to someone else who does not have the same surname, but the scores match, you are most likely NOT recently related. When we use the term recently related, we are talking about a time frame within the last 1000 years or 40 generations, a time depth that accommodates the earliest known use of surnames.

According to current theories, we are all related. The degree of relatedness depends on the time frame, or the number generations between the participants and the common ancestor.

We all descend from one single person, but of course the DNA test that we do is not to tell us this obvious fact.

Since we all descent from one person, and then from a few families, and as times goes by those families keep branching out up to the point where we get to our own family nest, it would be natural that when we check our DNA, the less markers we check, the less unique they are, and the more markers we test, the more unique the whole string of markers is. In other words, to go to extremes, if we tested only one marker, we would most certainly match with millions of individuals that shared that marker for thousands of years. But if on the other hand when we test many markers, we will match very very few people that share those same markers. Those would be the ones that are closely related to us.

This is valid when checking our matches on 12, 25 or 37 markers. The likelihood that we will match other individuals with 12 markers is far greater than matching on 25 or 37. Especially if our family descends from a populational group that came from one or a few prolific families thousands of years ago (which is the case for Western Europe). Dr. Luigi Lucca Cavalli-Sforza, Professor Emeritus, Stanford University, in his fascinating book: The Great Human Diasporas: The History of Diversity and Evolutions (http://www.amazon.com/exec/obidos/ASIN/0201442310/familytreedna-20) says that the total population of Europe was 60,000 people at the end of the last Ice Age, about 10,000 years ago. Now Europe has a population of 300 million people. This increase is almost entirely due to a natural increase in population rather then immigration from other continents. Keeping this in mind it is reasonable that many people alive today in Europe will match with other Europeans from BEFORE the time that our ancestors began the adoption of surnames, and when you match someone who has a different surname your first thought should be that the 'connection' is distant rather then recent.

Our bodies work as copy machines when it comes to the Y-DNA. You can have a copy machine doing 1,000 copies without a problem, and then, the 1,001 copy may have an "o" that looks more like an "e". And when we use this copy to make additional ones, all the new ones will now have an "e" instead of an "o". This is a simple way to explain how mutations occur in our Y-DNA when it's transferred (copied) from father to son. Mutations don't happen frequently, on the contrary, very seldom, but they can happen randomly in time, which means that I could be one mutation off of my father. That is why all those matches or close matches on 12 markers will in most of the cases go away when they happen between different surnames, and we increased the numbered of markers that are compared: more mutations showing up, which means way back in time when the common ancestor lived.

The only exceptions to this are if an unannounced adoption or false paternity has taken place, but that is difficult to prove, although certainly not impossible.

If two 12 marker results match for two participants with the same surname, and the genealogy research shows a common ancestor in 1835, the DNA test has validated the research and proven that the two descendents are related. In this example, you have two items of evidence to support that the individuals tested are related...a documented paper trail and the DNA results. In addition, the research provided a precise time frame for the common ancestor.

Without the genealogy research, and where 2 participants with the same surname match on the 12 marker test, then the scientific answer to the degree of relatedness is that 50% of the time the common ancestor would have occurred within 7 generations, or within approximately 150 years. The range of generations for the common ancestor extends to 76.9 generations, or almost 2000 years for those cases where there is not a surname in common. Therefore the importance of a surname link is paramount to provide a comfortable conclusion of relatedness. Most of the time random matches with people with different surnames do not stand the test for extended DNA testing.

While the MRCA tables (/learn/) will give you the general probabilities for relationships on different levels of matching, the FTDNATiP (/my/understanding-ftdna-tip.aspx) found in your personal matches page will give you probabilities that are specific to others that you may be related.