Thoughts on six degrees of separation

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I have known the idea "six degrees of separation" for a long time. While in high school, my friends and I also found that how we can connect to a famous actor within six people. After I read this paper and learn related topics, I have a deeper understanding about this idea. How it started, how it went and how it ended are interesting.

For the start of the experiment, I was surprised about the choice of starting population. The target person was a stockholder living in Boston. And two of starting population were selected from the state of Nebraska, but the third was chosen back to be in Boston. And I feel it interesting that choosing the target person and participants would vary for involving with much more features of social structure. We can observe that who plays a "intermediate" role or what kind of person plays that role. For example, people who do business on their own may know much more people in different fields. If they receive the document, they have more choices for the recipients to continue the experiment. Common paths are also been analyzed in latter part of the paper.The common paths usually have one thing in common with the target person: profession or living region.

Additionally, they came out a useful to prevent looping, i.e., preventing people to others who have already received the documents. I know that in 1960s, there may be not some efficient ways to record every one receiving the document in time. One problem that may be result from using the roster sent by mail is the lag of time. Maybe the list is updated after two person sends to the same individual. Although the probability of such thing occurred is small, it still exists and it will affect the completeness of the experiment. If this experiment will be done recently, maybe an online form can be used. Everyone can just log in to the form and sign up for it. It will always be updated to latest person.

While looking at the results and analysis, I am also curious about the distribution of the number of chains. As the experiment shows, the distribution may be binomial: one is approaching the target through his hometown, the other one is through the business contract. I guess maybe hometown address and profession may be two significant factors. If we do the experiment today and provide much more information regarding the target's hometown and profession in details, the number of chains may decrease a lot.

I noticed that in page 434, a few reasons of generating incomplete chains are mentioned. One is people may lose motivation to continue participating in this study; the other one is difficulty to find the next person. I guess if it could be better to filter the participants. For example, we can ask if the recipient to participant this experiment in advance, rightly after the person has decided

the recipient.

I am also impressed that they collect all the information, not only about the sender, but also about the recipient. It may be a lot easier to track how the chain is connected and which factor plays the most significant role or being used the most frequently. If doing the study today, classification may be useful to see which feature is important and whether we should keep it for future continuous study.

Their experiment is great, especially at that time. They consider a lot of things. They provide related useful and important information about the target person: years of graduation, age, military services, etc. These are helpful for participants to choose who will receive the document. However, I notice that there exist some incomplete chains that fails to reach the stockholder, who is the target person. We can ensure the starting group of people are voluntary; they are wiling to receive the document and continue the experiment. However, how we can ensure that the people who receive the documents would like to be pert of the experiment?

If this experiment was started today, much more efficient ways may be used. In the experiment done in 1967, people participated are required to send documents to the next person. Today, as the social media are being a part of our lives, we can use Messengers, etc, to track the acquaintance chains instead of sending letters. Thus, much more people can be involved with the experiment and then sample sizes can be increased a lot. Indeed, there exists an obvious problem of this method. Not all people in the world use the same social media APP. For people in China, they tend to use WeChat. For people in South Korea, they are more likely to use Line Friends or Kakao Talk.

In addition, as the types of transportation increases, people may tend to have much more connection, even across the continent. People will have more chances to know individuals from other cities, other countries. For example, I come from Asia, but since I spend my college life in North America, I know a lot of people from United States or other countries. Thus, the experiment can be enlarged to the whole world. The participants and the target person can be other country citizens, other races,etc.

In the conclusion, they said their methods sets an upper bound. One reason I think is the number of pieces of the information. Participants were told the target person's name, address and a few other basic thing. However, if much more information can be given to the participant group, I wonder there may exist shorter acquaintance chains to approach to the target. For instance, we can tell participants about the target's hobbies, what will he usually do at the weekend, where he has travelled, or even what kind of wine he likes to drink. As the experiment done in 1960s only provides certain basic information, I wonder the increment of useful information offered may lead to shorted chains, resulting in a small number to link the target person.

After I read the paper, I have a few questions. The first one is how they choose the target person. The paper only mentions that the target person is a stockholder living in Boston. However, what is the standard of being a target person? The acquaintance in this paper defines a mutual relationship: if person "a" knows "b", then "b" knows "a". Then, if we let the target person being a public figure, I believe the results may be totally different, even though people will only send emails if they know the target on a personal basis. Another question is this experiment was done in United

States, I may assume in Asia, such pattern also exists. However, if I choose to the participant in another area. For example, the target is in United States, a few starting population come from Asia, will the number of chains be larger? Will it require much more common paths to reach the final target person?