

Attraction to similar others and repulsion from dissimilar others as mechanisms of tie formation in social networks: mathematical models and empirical tests

Social relations of various kinds, such as marriage or friendship, are usually between people who are similar — with respect to age or education, occupation or hobbies, ethnic background or religious affiliations, political ideology or social status. This regularity has a name — homophily — and it has been confirmed by numerous sociological studies conducted over the past decades. The debate in sociology and related disciplines focuses on the *why*, rather than the *what*. The question about sources of homophily is also a major focus of the present project. More specifically, the project concentrates on two specific mechanisms of tie formation that “generate” homophily: attraction to similar others and repulsion from dissimilar others.

Although they may at first seem to be just two sides of the same coin, the two mechanisms are in fact quite different. Imagine I am standing next to an urn filled with black and white marbles; I can pick one of the marbles and I prefer it to be black. So, I look inside the urn, so that I can see the colours of the marbles, and I pick a black one from among them. My twin brother doesn't care much about what colour a marble is, so he just picks one at random, without looking into the urn. In this example, my marble is always black, while my brother's — from time to time, but the bottom line is that we *both* end up with black marbles far more often than if both were to choose them randomly. So, let us replace marbles with persons, black and white colours with, say, political ideology and — here's the homophily. According to the assumptions behind the attraction mechanism, some people in each population are like me — they care about colours and other attributes — and others are like my brother; the former limit their search for a friend, a spouse, a partner to those who are like them on a criterion they find important. The latter — they just don't care.

Suppose now that I am standing next to the urn again, only this time the marbles are wrapped in foil, so that I can't tell the colour of the marbles by looking at them. I still want my marble to be black, but in order to get one, I have to first pick one at random and unwrap it. If it turns out to be white, I re-wrap it, put it back to the urn, and pick a new marble. As a matter of fact, I keep picking the marbles at random until I finally get my black one. This is what the tie formation process looks like according to the repulsion mechanism.

Note that the colour of the marbles is easy to establish in the first example — all it takes is a glance inside the urn; but in the second example, figuring the colours takes some effort, as we have to first unwrap it from the foil. In other words, the attribute that I crave is directly observable in the first example and hidden in the second. One of the hypotheses we propose in the present project is concerned with precisely this distinction; according to the hypothesis, the attraction mechanism drives the tie formation process when the differences among people are actually visible, but when they are not, the process is driven by the repulsion mechanism. To illustrate, if I am short and I believe height to be an important characteristic, it'll be easy for me to limit my search for a wife or a friend to those who are short like me, because finding out who's short is basically costless. But if I also want my friends to share my political views, and there are no observable “signals” of one's ideology, I have no choice but stick to trial-and-error procedure of the repulsion mechanism: pick a person at random and try to elicit her views through conversation.

This hypothesis — along with others that we propose in our project — will be tested experimentally. In sociology, experiments are perhaps not as common as large-scale surveys, but a well-designed experiment has a lot of advantages. For instance, it gives a researcher much more control over the research process and it allows for “inducing” all and only those elements of a situation that are crucial for the tests of hypotheses. To be sure, laboratory settings are often simplified relative to natural ones, but it is actually a great advantage, because it gives the researcher much more power in figuring out which elements affect the process under study — and if they do in accord with the theoretical predictions. If they don't, we should abandon the hypothesis altogether, as there's no point in applying it to real-world setting when it failed in the lab.

Although the distinction between attraction and repulsion as mechanisms of tie formation may seem somewhat academic, it also has some practical relevance, as it matters greatly for our understanding of persisting patterns of social inequality, and our ability to reshape them, if they are due to voluntary decisions of individuals attracted to others like themselves or are forced by decisions of others who are reluctant to associate with people different from them.