Assigment 5

Emery Dittmer

2023-04-05

1 What is complex contagion, and how it's different from simple Contagion (you may want to refer to readings – Centola)

Simple contagion assumes an infection will spread to all connected nodes over time. An infection is not necessarily a disease or a negative in this context, it may be characterized as information, a type of activity or a disease. In simple infections, an infection is acquired if a node has an edge connecting to an infected node. In a network of people, if one person is infected all their connections will be infected at the next time interval. On the other hand, complex contagion assumes a threshold number of infected connected nodes is required for infection. In other words, in a network of people, there may be a requirement for over 25% of their network to become affected. So, a person with 4 connections will only become infected once at least 2 of their connections are infected. Complex contagion, therefore, requires many nodes surrounding uninfected nodes to spread infections. This indicates that networks need the right connections between nodes that surpass the threshold for all nodes at time tn.

2 What does complex contagion mean for diffusion of behaviors in the organization

Complex contagion within organizations has many implications. First, complex contagion indicates that the behavior of individuals is influenced largely by the brrrrrrrr of those around them. The connections that people have influence their behavior. An individual where many connections are doing a behavior is likely to adopt the new behavior versus others who have a network of people not adopting the activity. From an organization perspective, as the Centola suggests, leaders are reluctant to follow new behaviors. Instead, leaders tend to follow the majority. So to get prominent leaders to adopt a behavior you will need most people to do the behavior first. Centola cites the example of how Oprah adopted Twitter because it was growing so much as opposed to the growth being influenced by Oprah. The speed of diffusion depends on the network connectivity.

A second insight is that you can use complex diffusion to detect the interconnectedness of an organization. In order for a new behaviour to spread through an organization, the organization network in place needs to be sufficiently connected. There must be sufficient intragroup and intergroup connections throughout the network. The image below shows an example of insular networks that have high intragroup connections and networks that have. Both inter and intragroup connections are required for complex infections to spread. If the behavior stops or only effects some people versus others this is key data to demonstrate and share the influence network. As famous examples have shown networks can be rather insular, but a lack of openness to information of behaviors through the organization can lead to disaster as with the space shuttle Challenger.
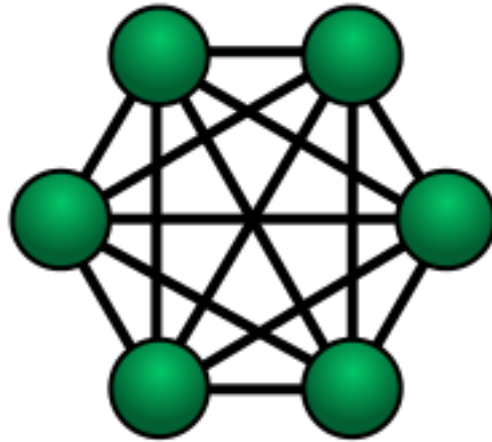
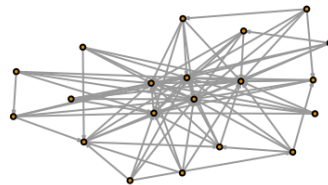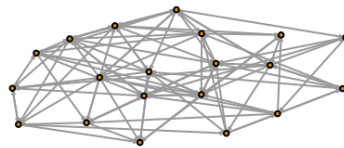Figure 1: Fully connected Insular network

Figure 2: Grouped networks with no interconnection

3 How can we use the threshold models to better manage

- Prosocial behavior in organizations • Learning • Toxic or unproductive behaviors

The threshold mode demonstrates a key method for knowledge spreading within organizations. Generally spreading knowledge and behaviors throughout an organization leads to harnessing the full potential of organizations, a broad buy in from many perspectives and a certain validation of behaviors as each person in the network plays a key role in spreading the behavior as well as stopping it. Threshold model can be used to better manage behavior or information within organizations in two main ways. First we can evaluate the network within the organization to understand the current state. Let's assume that we are able to introduce a behavior to the group. Understanding or seeing the evolution of this behavior through time and its effectiveness will inform the network of the organization. Complex infection networks need interconnectivity and intra connectivity to spread effectively as the behaviors will only change if the threshold is passed for the target person. Pragmatically if a behavior is introduced and the CEO preforms this behavior 2 weeks later then the network is balanced between inter and intra connectivity. New behaviors and pro-social activities can be influenced, new ideas will be spread through networks. If the network is not effective at transmitting information, there may be more effort in prosocial or mixing events required. However, the behaviors may not be positive. Therefore, the network within organizations may be relatively agnostic to the type of behavior that it is transmitting. This however presents an opportunity for the organization to influence the behavior or culture of the organization. If the network speeds information effectively an organization can mandate training for some or all individuals to effect change within the entire organization. In other words by trainings 10% of the staff in advanced management or culture techniques the entire organization will benefit from the training. The trick is to get the right 10% who will effectively spread the information.