

How Networks Affect and Contagion Individual's Social Behavior of Drinking

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Abstract: The research analyzes how networks affect an individual's social behavior of drinking by researching perspectives of both micro and macro, especially in the aspects of how different personalities and connections between individuals and their social network, and the development and structure of their social network. This document discusses and shares how a variety of information and behaviors are transmitted through social networks, and describes different contagion methods and social network structures, leading to different spread and diffusion efficiency results. The study adopts questionnaire surveys and longitudinal measures to explore different people's personalities and social networks through different question settings to discover the impact and relationships among them. Through analyzing a large number of samples and analyzing the different impacts brought by nodes with different personalities, three effective influences on personality and certain social network properties can be derived for having impacts on social behaviors.

Keywords: network, individual, social behavior, contagion, influence

1. Introduction

1.1. Nature of "Nodes"

Nowadays, people's social network has become increasingly flexible and large through the development of technology. Abundant various applications and software that offer social functions provide people a convenient way to broaden their networks, facilitating the number of social interactions and behaviors online. Nevertheless, the expansion of people's relationship networks and social convenience is a double-edged sword for people's social behavior, which will bring both advantages and disadvantages. According to the numerous research and tests that have shown the development and nature of social networks have a crucial influence on the frequency of heavy drinking and alcohol-related problems. Social networks that support alcohol consumption have a significant impact on alcohol abuse and related issues, as people are influenced by surrounding meals and advertisements. Thus, understanding and predicting how network changes related to drinking is vital.

Whether targeting the adolescent population or the general public, many factors can affect individuals' attitudes toward alcohol and drug use. One of the main factors is the impact of various aspects of the social network on this person. An objective fact that we generally agree on is that peers have a significant impact on individual alcohol consumption. They influence individual thoughts,

attitudes, and behaviors through common social interactions with the individual, and also the personal nature of the peers, such as their social network and whether they drink alcohol. For instance, the phenomenon discovered by Andrews and colleagues is that whether peers drink alcohol has a decisive predictive effect on whether an individual is drinking or taking drugs. Encouraging or normalizing adolescent alcohol consumption usually comes from peer pressure, which is a powerful “weapon” to push adolescents to “force” alcohol consumption [1]. The influence of peers usually serves as a thought suggestion and behavioral encouragement for individuals, leading teenagers develop the mindset that I have to drink and to be accepted. If peers generally drink alcohol, teenagers may be more likely to avoid social exclusion through drinking. If most of their peers drink alcohol, it will give the impression that drinking is normal and an expected part of social interaction. Therefore, teenagers may feel forced to comply with these perceived norms. In addition, group dynamics can amplify the impact of social networks on alcohol consumption, which is similar to the impacts of peers but changes in the form of a group. In certain social groups, drinking alcohol may be seen as a connecting activity, creating a sense of camaraderie among members. This is an example that we can consider from a micro perspective, where the nature of the entire network is seen as the need for alcohol consumption, thereby amplifying and increasing the demand and activity for alcohol consumption.

1.2. Family and Individual

The family environment and parental attitudes towards alcohol also play a crucial role in determining whether individuals are susceptible to the influence of alcohol. The position and influence of parents in the family often provide strong evidence of the level and manner of education that children receive from an early age, which in turn shapes their character. The family environment witnesses most of the child's growth process, which can directly influence the individual's attitude and thinking towards events, as well as their thought patterns. The concepts and values that children receive within the family have a significant influence on their social behavior. The attitudes, beliefs, and behavioral patterns of parents have a profound impact on the social behavior of children. If parents emphasize morality, respect, and integrity, children tend to exhibit more positive social behavior. Furthermore, the relationship between parents and children indirectly influences the social skills that children can acquire in a particular environment. For example, a supportive and positive parent-child relationship can promote children's social skills and adaptability, while indifference and negative attitudes can make it difficult for children to accept and develop appropriate social skills, gradually cultivating negative social behavior habits. Additionally, the parental system of supervision and their behavior and actions are important for the social behavior upbringing process, as parents spend the most time with their children and their supervision greatly influences whether children can develop correct social behavior values, establish appropriate behavior standards and a sense of responsibility, and cultivate their social worth. Moreover, based on a large amount of online information and examples, children usually imitate their parents' behavior and actions to learn their “first impression” social behavior. Therefore, parents' behavioral patterns directly influence children's habits and attitudes, and positive social behavior is imitated and internalized by children. In conclusion, parental attitudes towards alcohol influence the decision-making of adolescents and their sensitivity to the effects of social networks and behaviors.

Individual or adolescent contexts, the role of partners is equally important and will also be a major focus of investigation in exploring the factors of social contagion. The model of adolescent sexual behavior, helping us to elucidate and explain one of the factors of social contagion from another perspective. The comprehensive model includes studies on adolescent transition behavior and the diffusion of social innovation. Some bio-social models suggest that the social behavior of adolescents

is often driven by hormonal secretion, such as engaging in sexual behavior [2]. This is accompanied by the control and influence of parents, peers, and societal institutions (as mentioned above).

1.3. Network

Moreover, when it comes to the factor of a whole network's impact, we considered some reasons that influence an individual's drinking behavior related to the changes directly connected to the whole network, such as development, structure, etc [3]. For example, social media platforms also play an important role in shaping adolescent behavior, and studies have shown that network size also affects alcoholism. When discussing online media, the dissemination of images and various videos is inevitable. When these data are sent to people through platforms and then spread through their own social resources, this form and structure of dissemination is called a viral transmission, especially when the information has a negative nature [4]. A large number of individuals can use a centralized information dissemination mechanism of a large institution or group, which can enable many people to receive the same and interesting information at the same time, thus achieving its "viral" transmission [5]. The size of a certain social platform's network or the range that the entire social platform can cover will determine the degree of information received by each person, directly or indirectly affecting their social network. When the social network or sphere reaches a certain level, the degree of social impact on different people also varies. Furthermore, personality factors are related to alcohol consumption and motivation for alcoholism; At the same time, the relationship between personality and the number of drinking friends on social networks is important [6]. For example, if there are more than half of your social network's drinkers, the nature of your entire social network will change, and the joint activities of your entire social network will have an impact (Contagion). At the same time, the personality of each member of social networks usually affects you. When you need to adapt to each other to reach a consensus, you will always make some changes to integrate into the group. And every individual in this social group will change their social behavior to adapt accordingly.

2. Methods, Experiments, and Results

2.1. Introduction

Due to theoretical analysis of the significant impact of social networks on people's alcohol consumption, this experiment aims to explore the predictive potential of interpersonal differences on alcohol consumption throughout the entire network and its changes. When exploring the predictive potential of interpersonal differences on the entire network and its changes in relation to drinking behavior, we typically categorize individuals into different attributes for further investigation. For example, some people are extroverted while others are introverted, and their social network may differ accordingly. Based on common observations, it can be predicted that each person's social network usually aligns with their own attributes and personality traits. Occasionally, there may be exceptions where an individual's outward behavior does not match their underlying personality, resulting in a diverse range of attributes within their social network. However, this study won't delve into discussing these exceptional cases as they are quite unique, despite the fact that the majority of people exhibit such behavior in daily life.

2.2. Method

In this experiment, a data sample of over 600 newly married couples was used. The participants were repeatedly surveyed using designed questionnaires to collect information on their basic characteristics and real-time records related to alcohol consumption. The goal was to examine the relationships between gender, individual factors, and the structure and nature of their social networks over a period

of seven years. To ensure the completeness of the experiment, five different personality traits were considered to determine the centrality of each social network. These traits were Extroversion, Agreeableness, Conscientiousness, Neuroticism, and Openness. The basic survey information included their daily alcohol consumption, measured in weekly and monthly units.

In addition to assessing individual traits, participants were also asked to provide information about close friends in their social networks and to provide predictions of their drinking behaviors and alcohol consumption. Throughout the process, the researchers closely monitored the frequency of alcohol consumption and the amount of alcohol consumed per week for each participant, as well as analyzed the overall structure of their social networks. To investigate how social behaviors are spread through people's social networks, we used self-reports from participant questionnaires to collect data on their average weekly alcohol consumption and number of days drinking. We then analyzed their drinking patterns and regularities based on the drinking behavior elements they provided. In our data analysis, we subdivided the nature of the nodes on the entire social network based on the micro perspective we defined, and then observed the drinking rates of different structures in the macro perspective of the entire social network. When there was a clustering phenomenon in drinking behavior, we could determine that the contact person in this network had a higher probability of being a drinker [7]. When predictive data describes the connection between social networks and drinking behavior is continuous and variable, it allows us to more effectively analyze their changing logic and distinguish the impact of differences in network and interpersonal properties on drinking behavior under different attributes [8].

2.3. Analysis and Results

Based on the experimental data and analysis, as shown in Table 1, it is clear that the number of drinking friends for both wives and husbands exhibits similar trends and, in general, husbands tend to have more drinking friends than wives. According to the personality surveys conducted for each individual, wives and husbands show similar social behavior changes based on their personality traits and habits, specifically in terms of extroversion and drinking quantity. Individuals with lower levels of extroversion and drinking quantity are generally less influenced by time in their drinking behavior, while those with higher drinking quantity and extroversion tend to increase their drinking behavior as they have more drinking partners. Similarly, in terms of marital satisfaction, both husbands and wives tend to have more drinking friends, indicating a positive association with their drinking behavior.

Table 1: Final Statistics for Investigation [9,10].

/	Mean
Interviewee Drink Frequency per day	0.88
Close Friends Drink Frequency per day	0.96
Family Members Drink Frequency per day	3.07
Husband and Wife Heavy Drinking	0.23 and 0.06
H and W Extroversion	0.24 and 0.19
H and W openness	0.05 and 0.09
H and W Drinking Buddies	0.08 and 0.28

Meanwhile, this paper also found that when these extroverted individuals with high levels of alcohol consumption are supported by their overall social network, which is defined as promoting drinking and relies on drinking activities, the drinking behavior spreads to more people, resulting in what people call a clustering phenomenon, as shown in Figure 1. The basic modes of transmission

include: Social influence: People are influenced by their social connections and are more likely to adopt similar drinking behaviors if they observe their friends or acquaintances engaging in such behaviors. Normative pressure: Social norms within the network encourage and reinforce drinking behavior. Individuals may feel pressured to conform to these norms in order to maintain social acceptance and belonging. Information sharing: Information about drinking events, venues, and experiences is shared within the network, leading to increased participation in drinking activities. Social bonding: Drinking can serve as a means of social bonding within the network, fostering a sense of camaraderie and shared experiences. When these data are sent to people through platforms and then spread through their own social resources, this form and structure of dissemination is called a viral transmission. Overall, these factors contribute to the spread and reinforcement of drinking behavior within the social network, especially among those who are extraverted and have higher levels of alcohol consumption.

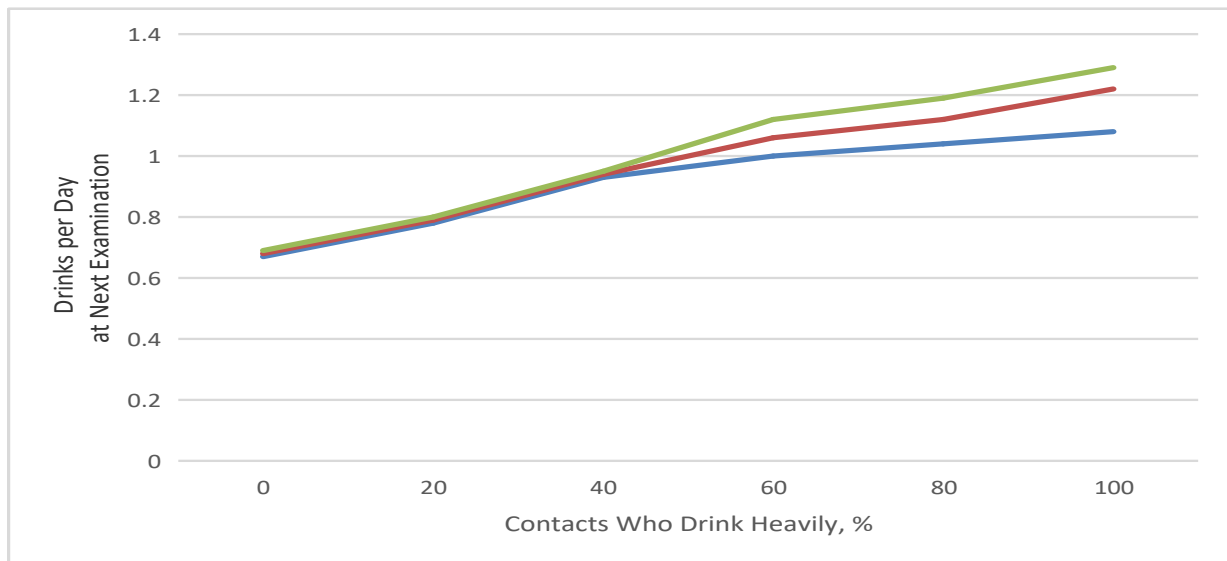


Figure 1: Relationship between drinks and contact frequency [10].

On the other hand, considering the size of social networks, when a social network expands, the corresponding population's exposure increases, resulting in more participation of drinkers and increasing the frequency of drinking-related gatherings. In such cases, individuals are more likely to be influenced by social norms and pressures, making them more prone to engage in drinking activities. Conversely, when a social network contracts, the population's exposure decreases, resulting in less influence on individuals. In modern times, many people reduce the size and scope of their social circles to increase self-discipline and focus. Furthermore, changes in the social network structure also have an impact on drinking behavior. For instance, when an individual has more drinking friends among their close connections, they are more likely to be influenced by their social circle, thereby increasing the likelihood of drinking. This can be understood as a chain-like propagation, where one person's friends have nine drinking buddies, and the individual is likely to get acquainted with these nine drinking buddies, who in turn have more drinking buddies, forming a chain-like propagation and rapidly increasing the individual's number of drinking friends. Conversely, when the number of drinking friends among close connections decreases, the propagation slows down, thereby reducing the likelihood of drinking.

3. Conclusion

The reason why this paper discusses the influence of social networks on individuals' social behavior norms is because people's different social behaviors can be influenced by social environments and norms, which are shaped by their unique social network patterns. Social networks and individual personality have a significant impact on drinking behavior. These findings contribute to a better understanding of the spread and patterns of drinking behavior and provide a basis for developing relevant intervention measures. Social networks have different effects on different individuals, often related to the nature of different "nodes" in the social network, such as the role played by families in the social network.

Differences in interpersonal relationships and personalities within a social network have a significant impact on drinking behavior. Each individual has unique interpersonal connections and social interaction styles within their social networks, leading to different social behaviors and outcomes. Regarding the attributes of social circles, different individuals within a social network create diverse attributes that coexist within the network. Each social network has different clusters with distinct attributes. When clusters with a preference for drinking and more drinking friends spread and propagate within a social circle, they can influence the drinking behavior of other individuals. Furthermore, the influence and normative pressures resulting from these attributes can vary among individuals. Some people are more susceptible to the drinking behavior within their social networks, while others are more resistant to this influence. Social influence and normative pressures can spread through interpersonal relationships within the social network, affecting drinking behavior throughout the network. These norms often refer to specific social behavior guidelines set by different attribute circles, such as drinking, smoking, etc. Lastly, as previously discussed, different social interactions and information sharing within the network can influence drinking behavior. Some individuals are more inclined to share information about drinking events, venues, and experiences, thereby promoting the spread of drinking behavior. Similarly, some individuals prefer to use drinking as a means of social connection, reinforcing their drinking behavior.

The findings from study suggest that the number of drinking buddies of individuals is typically influenced by their social networks and subsequently affects their drinking habits. By analyzing data on drinking quantity and the number of drinking buddies, we can predict and understand how drinking buddies change over time. Specifically, the data indicates that individuals with higher levels of heavy drinking tend to have an increasing number of drinking buddies over time, while the opposite trend is observed for those with lower levels of heavy drinking. This aligns with our initial research direction, highlighting how social networks supportive of alcohol consumption can enhance and facilitate the spread of this social behavior through drinking interactions.

Similarly, besides discussing the overall structure and nature of social networks, the norms within the social network itself can also influence people's social behaviors. The simplest and most common example is that smoking is typically not allowed in public places. Research has shown that different types of individuals respond differently to the same social norms. Different social attributes and personality types have different attitudes and understandings towards the same social norms. For example, introverted individuals may choose to adhere to these social conventions because they prefer to limit their social interactions. This leads to different roles in life having different corresponding effects on the same social norms. Additionally, other factors such as environmental influences, job pressures, or peer influences also play a role in shaping an individual's social behaviors. For instance, men often carry the role of being the breadwinner in a family, while also striving to be a good father. The external pressures of work and the responsibility of being a good parent can lead them to engage in drinking behaviors as a means to cope with stress. This brings us back to the initial discussion of looking at behavior diffusion from a micro-level perspective. Different individuals possess different

attributes and behavioral habits, resulting in variations in the transmission and reception of information. These differences ultimately have an impact on their social behaviors.

Overall, these findings highlight the importance of social factors in understanding drinking behaviors and the role of social networks in supporting and reinforcing alcohol consumption. Returning to what we said at the beginning, we will analyze the two main points that can affect individuals' drinking behavior. From a macro perspective, that is, from the perspective of the entire social network itself, its changes and nature can influence individuals' decisions about drinking; At the same time, from a micro perspective, the personality and behavior of friends around individuals, as well as their own personality and social aspects, will have an impact on their drinking behavior. From the survey results, we can know where the aspects and points that can affect people's behavior are, but what we need to do is to effectively improve and respond to these points, rather than urging and criticizing them, in order to achieve healthy physical conditions and correct social values.

References

- [1] Andrews JA, Tildesley E, Hops H, Li F. *The influence of peers on young adult substance use. Hlth Psychol.*
- [2] *Social Contagion and Adolescent Sexual Behavior: A Developmental EMOSA Model*
- [3] Delucchi KL, Matzger H, Weisner C. *Alcohol in emerging adulthood: 7-year study of problem and dependent drinkers.*
- [4] Anderson RM, May RM (1991) *Infectious Diseases of Humans (Oxford University Press, Oxford)*
- [5] *The Structural Virality of Online Diffusion Author(s): Sharad Goel, Ashton Anderson, Jake Hofman and Duncan J. Watts*
- [6] Leonard KE, Kearns J, Mudar P. *Peer networks among heavy, regular and infrequent drinkers prior to marriage. J. Stud. Alcohol.*
- [7] Del Boca FK, Darkes J. *The validity of self-reports of alcohol consumption: state of the science and challenges for research. Addiction. 2003;98 Suppl 2:1-12.*
- [8] Carrington PJ, Scott J, and Wasserman S. *Models and Methods in Social Network Analysis. New York: Cambridge Univ Pr; 2005.*
- [9] *Social Network Homish, G. G., & Leonard, K. E. (2008, November). The social network and alcohol use. Journal of studies on alcohol and drugs. Luigi T. De Luca, Propulsion physics (EDP Sciences, Les Ulis, 2009)*
- [10] *The Spread of Alcohol Consumption Behavior in a Large Social Network J. Niels Rosenquist, MD, PhD; Joanne Murabito, MD; James H. Fowler, PhD; and Nicholas A. Christakis, MD, PhD*