

The Science of Happiness and Wellbeing
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Module No # 04
Lecture No # 17
Networks and its reverse for happiness and Wellbeing

Good afternoon friends in the last many sessions we have talked about human beings and their relationships. In that particular context we have talked about the self its identity and its relation with the other. We have also talked about the fact that the other matters to us to a significant extent we have talked about the context of pro-sociality and different illustrations and examples of, pro-sociality.

Today and we have also talked about relationships today's focus happens to be on something which is linked or intrinsically related to the concept of relationship with and that is networking. Now this is a component of the set of talks which connect the dots so what I am going to do in this session is I am going to talk about the concept of networking which is very popular today and very, relevant today.

In fact networking by default might be very very old but theorizing about it making it into a distinctive discipline and doing a lot of work very rich very sophisticated empirical work is something which is fairly recent. It is something which was born in the later part of the twentieth century and is very much a part of integral part of the contemporary explorations of not only our, lives and relationships but specifically social media.

So much of what I am going to talk about will relate to the context of social media but it will also indirectly or directly relate to our lives.

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- Why are we connected?
- How are we connected?
- Three degrees of influence
- Six degrees of separation
- Relevance for happiness and wellbeing

The areas that we are going to cover would be why are we connected how are we connected and 2 concepts related to connectivity 3 degrees of influence and 6 degrees of separation and their, relevance for happiness and wellbeing.

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Some questions

- **Why are we connected?**
- **What are the different kinds of connections we have?**
- **Can you categorize these connections?**

Now one of the things that I ask my class is that why are we connected and as I have already shared with you earlier. Both in terms of our identity as well as our survival or rather in the other order of our survival and our identity without our being related to somebody else this is impossible. The other must exist both for my survival and for my identity but, let us make it plural the others must exist.

But what is more important is the system within which I and the others exist and the kind of relationship the, I and the others follow the different categories of relationship is what we are going to focus on in today's session.

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Examples

- The Chronicle of a Death Foretold:
- Romeo and Juliet
- Hall Rivalry
- Bar Fight
- Cascade of violence ...

Morality resides in groups rather than individuals

So you see that I will start with the last point that I have made in italics morality resides in groups rather than individuals. I think I have made this point earlier as well that if you are looking at stories parables. If you are trying to search for the rules that govern our day-to-day lives much of it is derived from the sociocultural context. And more specifically group behaviour to a very great extent decides the individual behaviour within that group and that is what we are going to focus on.

As individuals we behave in, specific ways but within the context of specific groups we behave in other specific ways that is a part of the aspect of socialization and it to a significant extent modifies our behaviour. I am reminded by a beautiful story by Gabriel García Márquez the very famous twentieth century novelist chronicle. The chronicle of a death foretold where you see that in a village when the hero of the novel is, supposed to be killed everybody knows that this person is going to die.

And everyone including the people who wish to if were waiting to kill him do not want that he should die. And because of the social forces in operation the inevitable happens and in spite of the fact that it is foretold forecast and everybody wants that it should not happen it actually finally ends up happening. If you, take the example of Romeo and Juliet that gives us a different dimension a different understanding something which is directly related to what we are talking about.

While the romantic aspect of the story of Romeo and Juliet is well highlighted if we start asking the question why is it that this romance evolved or blossomed. We realize that it is for no other

reason but because of rivalry between, 2 houses or 2 groups. If you start looking deeper into the rivalry you find that there is a very interesting thing which is happening the people who are fighting duals and killing one another there which kind of precipitates the situation over here and Romeo also kills one of the kings of Juliet.


In most of the cases they do not even know one another so the question that comes up is that if I, do not know a person why am I going to kill him and one is reminded of what is known as hostel rivalries. If you are still in the college or the university or were a part of that and you remember it you will find that amongst various hostels college hostels or even school hostels university hostels there are rivalries.

And so there can be intellectual rivalry which is well and good but, there can be also physical rivalry where anybody who sees a person from the other hostel would immediately without any thought once he is recognized hit that person or kill that person. If you are looking at a more serious aspect of it then that is the different kind of ethnic riots that we have so the moment we are talking about riots on the basis of your cast.

On the basis of your religion without, knowing a person the other person is manifesting behaviour of violence why does that happen there can be other kinds of violence also like bar fights. In bar fights which; is very interestingly caught in many movies one person hits another person and that person hits a third person. So you find that 2 people who are fighting but at the end of the day the entire bar the entire community within the, war is fighting one another number of very interesting concepts.

So these are known as cascade of violence a number of interesting concepts come here group morality group norms and the way that the group regulates how we operate this is one interesting thing which emerges. The second thing which emerges is the concept of influence who influences whom to what extent and why. And the third thing, which emerges is the element of contagion now it is a subset of influence but of a different kind we will talk about these specifics as we go ahead.

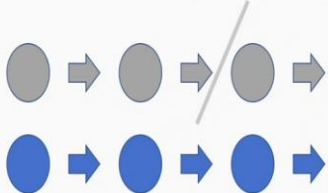

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- The friend of my friend is my friend
- The friend of my enemy is my enemy
- The enemy of my enemy is my friend

Donating a kidney to my best friend's husband

Helping my friend's friend's friend...

See we have these statements which are used in politics the friend of my friend is my friend this operates at various levels. Let us say that my computer is giving me trouble so my friend's friend is somebody who is good at software and he says that okay he will help you. So there is and my friend's friend is willing to I mean agree to what my friends request and come and help me my friends the friend of my enemy is my enemy and that we saw in the examples of Romeo Juliet and all that.

The enemy of my enemy is my friend so these are the fundamental norms by which we basically see things happening. And the implication is that in the earlier slide, we talked about the various implications of unruly rational behaviour. But there are examples of gratitude and generosity where we have stories of donating a kidney to my best friend's husband or helping my friend's friend.

So what we are talking about here is not groups but networks I will explain that to you in a moment. The entire focus right now is no longer on group behaviour when we are, talking about mob psychology that is group behaviour but a group does not have a system in place. A group is a group is not orderly not organized not systematic. A network is and that is hence there is a big difference between the 2 and that we will talk about.

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Group vs. network

- The example of the house on fire
- Bucket brigade
- No arrangement ... to arrangement

- Arrangements can be different
- Ties
- Ties (evolve) are different for different functions
- Same group can have *different ties* for different work



Group: Collection
Network: Collection
related in a specific way



Let us take the example of house on fire which is a very well-known example and I am giving all the references at the end which, is from a wonderful book on networking. Let us say there is a house at a distance of 100 meters from a stream and the house is on fire and there is a village in village there are 100 people who are able to help this person what are the 2 options that these people have the first option which generally happens and this is a part of group behaviours as a as a group as a community they want to help, this guy.

So they will run with their buckets to the river and then they will fill the buckets with water and then come running back and then try to extinguish the fire what is going to happen in the process? 100 people dip their buckets start running by the time they reach the stronger ones still have a little bit of water some of them fall on the way and end up having no water going back to the, river.

Another group come back with maybe a quarter full bucket of water and then they throw and they rush back this is how the group is going to behave the intent of the group is very very clear they want to help this guy but the way that the group operates is like this it is not organized. On the other hand there is a concept of a bucket brigade imagine that the 1 or 2 people say that hey let us not go like this let us form a system.

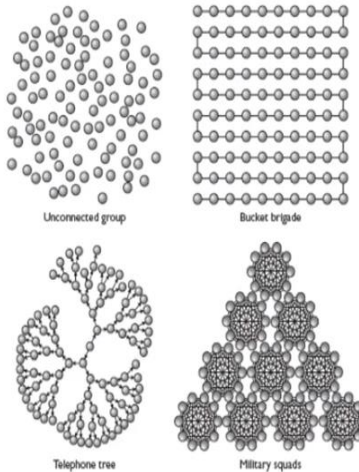
So at a distance of one meter they all stand 2 people stand near the house and two people stand near the stream. The people standing near the stream their job is to fill up the buckets and hand it over to the next guy and through a chain the same the buckets keep on moving up and down and there are 2 people at the other end who keep on extinguishing the, fire. If you are looking at the efficiency of the 2 systems you find that the second system is extremely more efficient.

And this is an example of the simplest kind of network there can be many different kinds of networks we will talk about that.

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- Ex: A Village
 - Fire fight
 - Educational help
 - Voting and election
 - Marriage gift and feasts

Created vs. evolved networks



Telephone tree: 50 people have to be notified that classes will not be held. How to do it?

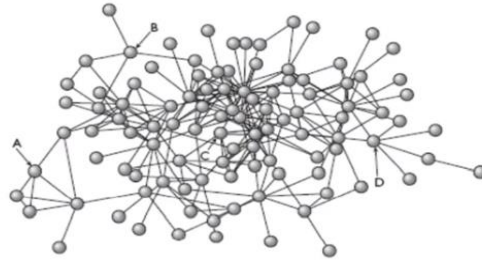
So you have what is known as a telephone tree network let us see that imagine that in a class the principal tells that hey the, class is suspended tomorrow we have to inform the parents. So let us say that the principle talks to 3 parents and say that please communicate to another 3 parents and the stream is. Just in the neighbourhood and the chain is created and maybe over the next 4 or 3 or 4 steps everybody is given the information this is a different kind of a network which is known as a telephone tree.

We have military squares generally of 10 people and they form a part of a larger group but then it started from the time of the Romans. And these groups are extremely cohesive they are willing to give up their lives for one another and the trust element is very significant and they form self-contained unit they are loosely connected with the others. This is another kind of network. So and in contrast you have a group where these people are together but there is no specific kind of connectivity that we find amongst these groups.

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Centre and periphery

- How many friends do you have?
- How many friends do your friends have?
- How many friends to your friends' friends have?



In this natural network of close friendships among 105 college students living in the same dormitory, each circle represents a student.

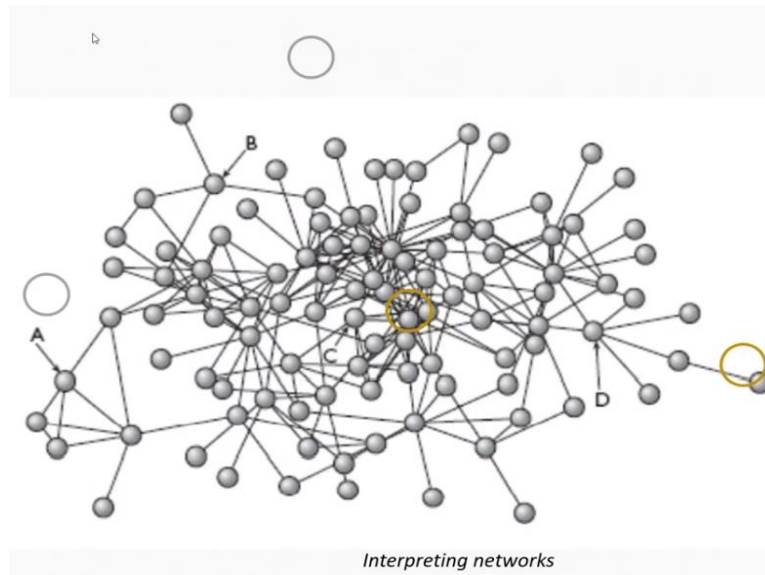
We will talk a little more about networks before we start connecting it with its implications in the context of happiness and well-being. Let us say that I have asked myself this question how many friends do I have maybe I have got 5 good friends. But the quality of my 5 good friends does not decide my fate in a sociocultural context. Imagine that I have 5 good friends but each one of them is extremely shy and they have 2 good friends each.

So if looking from a network perspective then what happens how many friends at 2 layers do I have I have 5 and they have 2 each which means ten so I have a total of 15 friends when I, am going to layer 2. Imagine that one of my students here has 5 good friends but each one of them has 5 good friends then look at the second layer how many people are there? In my case it is 15 and in his pr her case it is 30.

So you find that the network does not or the and there is another thing I will talk about where do I locate myself in the network of relationships the networks, can be of various kind but in the network of relationships where do I find myself? Let us say that if I am somebody who I am very influential let us say our prime minister what kind of a network he has and me what kind of a network I have?

I have compared to him a very poor network so I would say that I am at the periphery of a network.

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Let me elaborate this point a little further the element of centrality and peripherality let us say that if you are looking at the people who are right here and the people who are right here. You find that people who have poor connectivities who have again poor connectivities can be considered as peripheral or weak networks. And people who have strong connectivities who have strong connectivities can be considered as the centrality of the, network.

So your influence your ability to influence people your ability to have a strong robust relationship connectivity does not only depend on how good your friends are it also depends on the kind of influences your friends impact on their friends and their friends impact on their friends. And that is the beauty and that is the secret of a network and the ability to influence other people.

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Rules in network

- Networks can involve short term or long term ties
- Contagion
 - What flows across the ties – money, violence, happiness, misery ...
- We shape our networks
 - Homophily
 - How many are we connected to
 - How densely connected our networks are
 - How central are we in our network

Average American: Four close friends

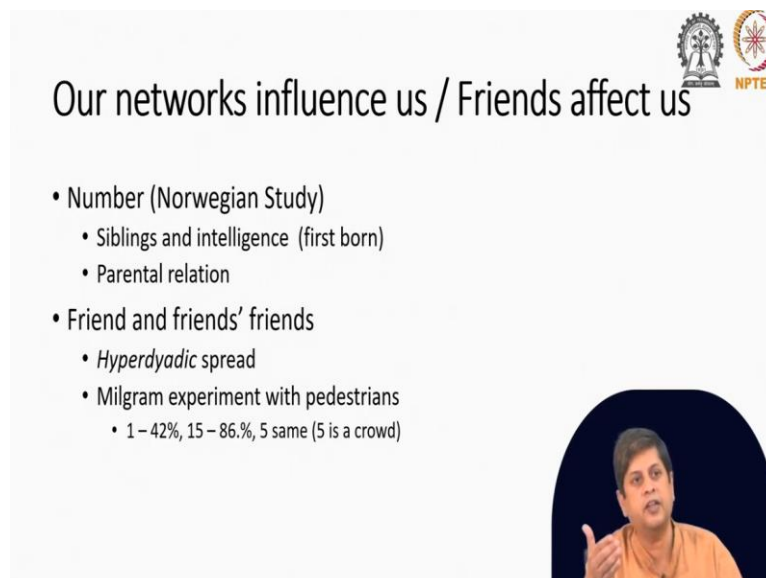
Poll: How many do you have, 1, 2, 3, 4, 5, 6?

52% probability your friends know one another

I, will talk a little bit about the rules in a network. Networks can be short-term networks long term networks depending on different conditions but what is very very important which I talked about a little earlier is that what? Flows across the network is something which can vary across the network money can travel violence can travel happiness can travel misery can travel. And one of the fascinating things, on the basis of which networks are created is the first one is known as homophilic which is that we generally create network with people who are similar to us.

Other things how many are we connected to how densely connected our networks are how central are we in our networks these would define the kind of influence I have. And the reason I am focusing again and again on the element of influence, as well as connectedness is something which I will reveal towards the end of this quick short talk.

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The slide features the title "Our networks influence us / Friends affect us" at the top. In the top right corner, there are logos for IIT Bombay and NPTEL. The main content consists of two bullet points: "Number (Norwegian Study)" with sub-bullets "Siblings and intelligence (first born)" and "Parental relation"; and "Friend and friends' friends" with sub-bullets "Hyperdyadic spread" and "Milgram experiment with pedestrians" (with a further sub-bullet "1 - 42%, 15 - 86%, 5 same (5 is a crowd)"). A small video inset in the bottom right shows a man in an orange shirt speaking.

So I will I will skip some of these I have already talked about friends and friend's friends which is known as a hyperdyadic spread diadic is 2 people when you go beyond two people it is known as a hyperdiadic spread. The Milgram experiment with pedestrians is something which I will I will discuss, with you very briefly what happened was that? Let us say you can do this experiment at home.

Let us say that you have a group of let us say 15 friends let us say that 2 of your friends are standing by a window and you are standing on the street and you are looking at your friend. How many people are required so that any passerby who is look; going by will also look at your friend. In other, words the number decides how you are going to behave for instance let me put it in this way that I am looking at a window and standing on the street people are passing by me; what is the probability that other people will also look up?

The probability is less than 50% but if 10 people start looking at a window then there is a very high probability that 90% of the people who, pass by will also look at the window. So as a group you can influence so these concepts are linked to network in certain ways I will talk about that.

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The network and its life

- La Ola: clockwise, 20 seats per second
- Excitable medium - shifts states quickly
- Networks operate with some degrees of will
- Collective/networked intelligence (intuitive?)

But here I will just focus on 2 or 3 relevant aspects of it and not all of it. La Ola is a part of the football or the cricket ground where the crowd forms this waving patterns they get up and they go down and they form waves. Network has, its own life network is an excitable medium which shifts quickly networks happen to operate with a certain degree of free will you are not able to predict it very clearly.

And collective networked intelligence can be very efficient in fact the whole technological explosion that we are talking about today is based on the concept of networked intelligence.

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Six degrees of separation



- Stanley Milgram: 1960s Nebraska experiment – businessman in Boston
- Six hops
- Duncan Watts and Peter Dodds (2002) 98k subjects –email messages to targets around the world



But there are 2 concepts primarily, which are related to well-being that I would talk about the first one is the 6 degrees of separation which is a question of how deeply connected are we with one another. Let us say that I am here and I do not know somebody in the remotest corner of South Africa or North Africa some part of interior jungle of Africa. And somebody tells me that okay how many people do we need in between so; that my, letter or maybe this pain or this mouse whatever it is can be can reach that person.

So experiments of this kind were carried out how do you transmit this you transmit it along a network? So I search for I start tracking my brain do I know somebody who knows anybody in South Africa? I said no I do not know but I have a good friend who is very very well connected let me talk to him and he says that yes i, have a friend in South Africa. Then he connects to that friend and says that I have to send something to a person at x and that person reacts in brains and says that who could possibly get connected there.

This experiment was done in 1960s with around 1000 letters which were sent from one end of US to the other end of US. And they wanted to find out how many people were required in order to, finally transmit the message the same experiment was recreated in 2002 this time with emails and with close to 1 lakh people. What was discovered as you can see in these blue dots is that on an average 6 people are required.

So from me to you if you are a known quantity and I am an unknown quantity to you 5 in between people are required to connect us this tells us about the power of, networking. I will talk about it the reason for I will try to connect it all together.

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Three degrees of influence

- Everything we say or do ripples through impacting our friends (first degree), our friends' friends (second degree) and their friends (third degree)



Now let us talk about 3 degrees of inference I have a couple of my students here and if I am unhappy because they are closely interacting with me they would also become unhappy. Now does it stop here research tells us that if I am unhappy with my students which is number one this unhappiness does, not stop there. This unhappiness gets reflected in their networks; which means that their friends that is number 2 they also become unhappy.

But it does not stop even there it goes on and percolates down to number three number 3 set of people become unhappy remember the example I gave you a little earlier that you have a weak network or a strong network. I have 5 good friends but they have, 2 good friends each imagine that in that network I am I am extremely happy cheerful I am transmitting what happens?

By the time I reach the second layer I have reached 15 people who feel happy to a certain extent by the time I have reached the third layer there are maybe another 30 people. So a total of maybe 45-50 people who; are influenced by my feeling of extreme exuberance and happiness. On the other hand the other person I was talking about who has a strong network of 5 into 5 into 5 is extremely unhappy and angry and this percolates down to how many people more than double so maybe around 150 to 200 people.

Now if you are looking at these two points that I made the 6 degrees of separation and the 3 degrees of influence what it tells us is that. Because we are networked, and because; my happiness unhappiness affects somebody else's happiness and unhappiness. It implies that in such a situation there is societal or the environmental happiness factor is something which is which spreads which is contagious.

On the other hand the 6 degrees of separation tells me that we have such a powerful element of connectivity we can connect for both good and bad. The mechanism, is available to us if you want to do good through these networks we can really influence people if you want to do bad through these networks we can also do equal amount of injustice and yield to everybody around us.

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Why only 3? Ripple effect

- Decay
- Network instability
- Evolutionary reason

Social chain reaction

Thus most of us are connected to thousands of people... at three levels

Example, you have 20 friends, who have 20 friends each who have 20 friends each

$20 \times 20 \times 20 = 8000$

Now before we sum up I will skip some of these points decay network instability plus why only 3 there are reasons for that we will not go into that why it happens we will also, not go into that.

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What is determined by this?

- Happiness, wealth, health...
- Situational inequality in network affects this
- Example of epidemic hysteria in Tanzania
- **Emotion contagion**
- The hot spice experiment

One of the things we talked about is the emotion contagion that we talked about the fact that my feelings affect somebody's else's feeling and that affects somebody else's feelings. I will not go

into the details of it because of the lack of time but epidemic hysteria in Tanzania was studied closely and they found that it started with schools and then it pervaded the, entire location and other places.

Many such instances were also found in the US and groups of scientists visited these places and they found no disease there. So this apparent within quotes diseases where diseases created by contagion somebody feels bad and that kind of impresses 5 another schoolgirls this impresses another set of school girls and this kind of disease spreads and it appears, mysteriously and disappears mysteriously.

But these examples tell us the power of network and this power of network is something which we see in operation when we are looking at social media to a significant extent. It affects our relationships true but it affects our relationships through social media to a significantly greater extent. And social media is a vehicle for either, communicating happiness or unhappiness communicating the message of positivity or negativity is also something that needs to be reflected upon.

My social media messages my social media profile what I managed to share over social media is going to affect a significant number of people depending on how influential I am how strong how central I am in the network. The element of positivity not only, depends on groups on relationships they also depend on networks. And that is something we need to remember in a world where social media rules.

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Let us assume that giving pays...

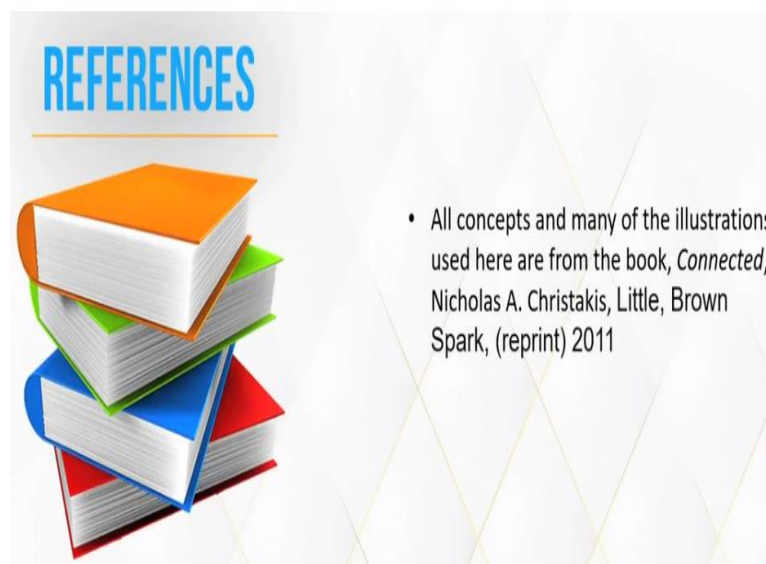
- In the long run... the President
- The medical students...
- Productivity...
- Happiness...
- Sense of justice...

- And that in an organization givers behave differently from takers

And I hope that this element of relationship is something which will have relevance for all of you in the context of the information as well as the way you can use that information in various contexts. Can lead to we talked about if you remember when we, talked about give and take we talked about medical students we talked about various other places where relationships played a significant role.

Now we are talking about networks and networks can play more significant roles in such contexts leading to positive transformation or destruction.

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So the concepts were taken from this beautiful book connected by Nicolas A. Christakis you can go through that, and the images were also taken from there. And I hope that these insights will drive you towards reading more about networking which is so much a part of our life. And which so much influences our happiness and well-being thank you friends.