

**Social Networks**  
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**Lecture – 66**  
**Homophily (Continued) & Positive and Negative Relationships**  
**Balance Theorem**

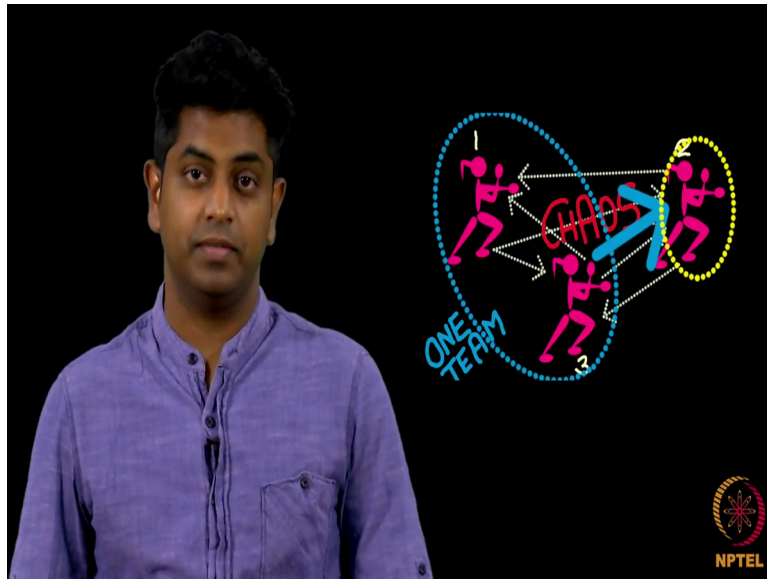
So, we are now going to show a very real world observed phenomena. In fact, I will tell you about it and it will be surprisingly true you will even say why do we have to talk more on this isn't it obvious, but then this is very elegant mathematical proof for it what is the question imagine this is a boxing ring.

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And there are 2 people in the boxing ring and what you do is you introduce a third person when you introduce a third person what happens 2 people are trying to fight. This is a third person who is trying to fight and the third person does not join the first 2 people he is trying to fight the 2 people every person here is trying to fight the other 2 people we will this work what will happen eventually.

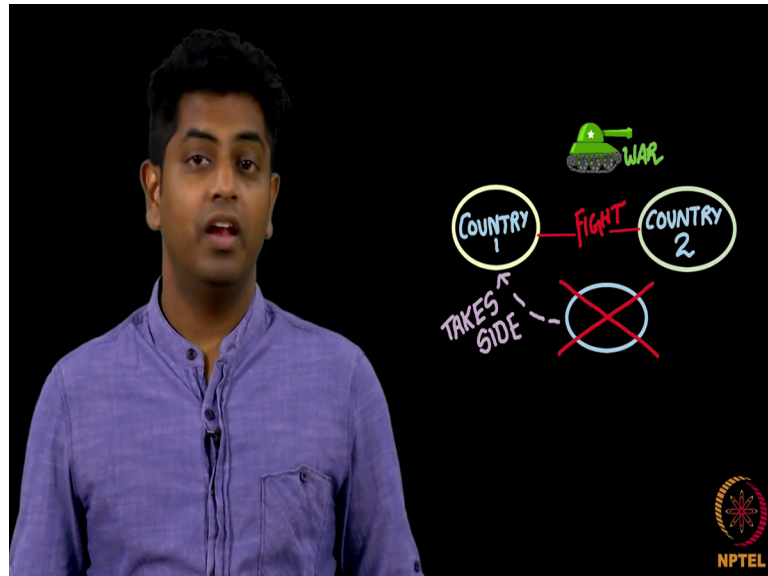
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The first person is trying to hit the third person and second person second person is trying to hit the first person and the third person the third person is trying to hit the second person and the first person.

It will be a chaos it cannot be a proper fight unless 2 people get together into one team in that case these 2 people we will fight with this one person and they will be a when or a loss, but then when you have these 1 1 and 1 the boxing ring gets very chaotic does it sound very familiarity have not you seen in a group the fight is generally between 2 teams.

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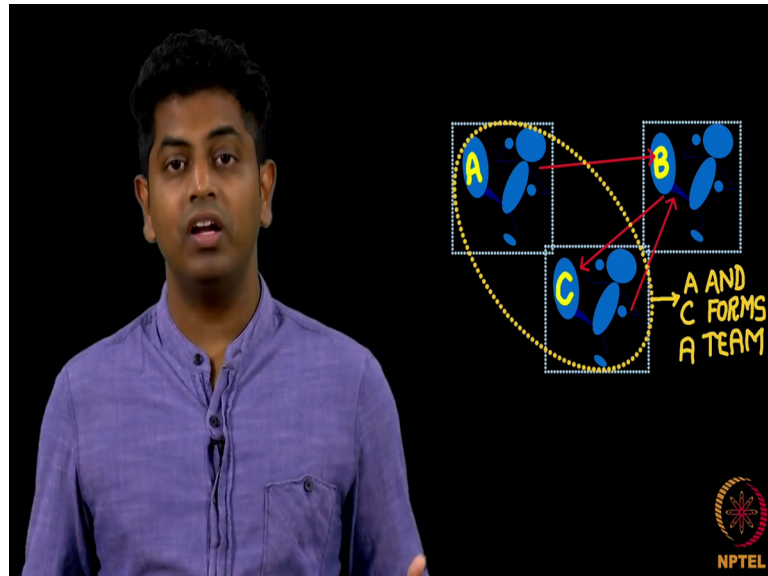
It is never between 3 teams why is that this sounds all the more familiar to you war when its waged it is never between 3 countries it is always between 2 countries may be is the third country, but the third country we will take some one side. In fact, it is observed in world war one and 2 that countries did take the side of some other country and the war was generally based between 2 groups in a bunch of people the war is always between 2 groups not between 3 groups.

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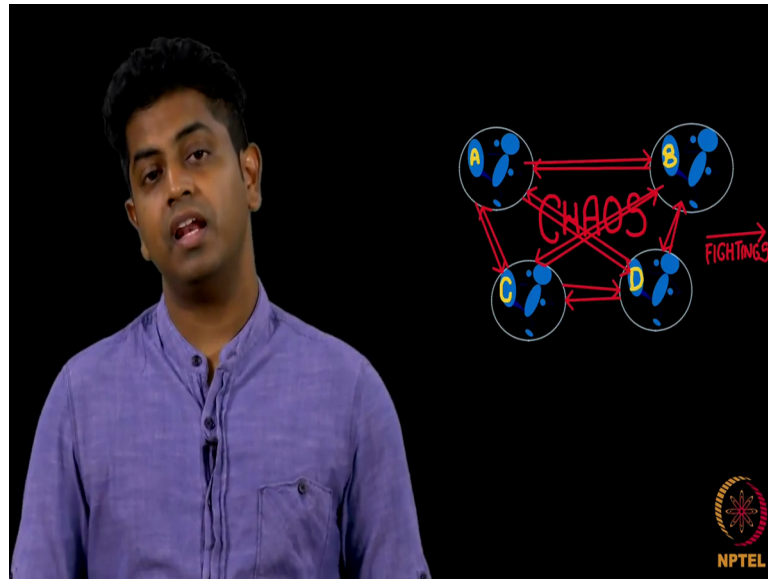
Now, can you connect the dots and tell me why exactly this happens that is because enemies enemy is a friend correct as simple is that how.

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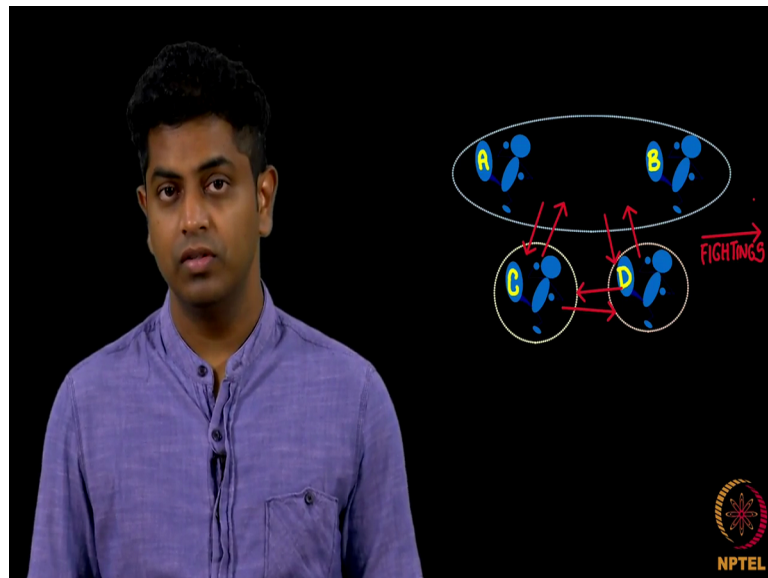
Assume you have a boxing ring and there is A B C fighting with each other when A realise us that he needs to hit B and B realise that he is should hit C right a should hit B A and C also should hit C there A C can get together and hit B, right so on and so forth. This is the some kind of a chaos here and then it can only be resolved by 2 people taking one side. So, when these people take a start getting taking in sides that enemies enemy becoming friends sort of a thing.

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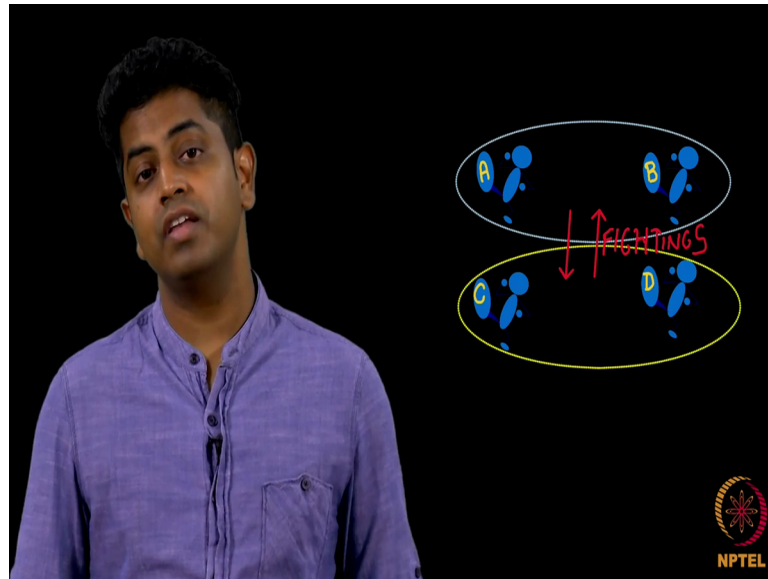
Then there becomes 2 teams imagine there are 4 people who are trying to box in a boxing ring now what happens again the same thing there are there is 1 2 A B C and D trying to box with each other and then A hits B, A hits C, A hits D and every single person is trying to hit the other 3 people chaos.

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So, some prefer order emerges there and then this split into few teams maybe 3 teams from 4 teams A B C D is 4 teams and they realise this cannot happen this cannot continue and this aggregate themselves into 3 teams still there is chaos.

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As I told you before these 3 teams again gets converted to 2 teams no matter how many people you put it is always 2 teams, why is this true let us try to look at it mathematically right now.