

Structural Properties of Cyber Sports Teams and Their Economic Success

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This study is aimed to investigate how earnings of professional cyber sportsmen gained from the gaming reflect their position in the transfer network. Since in cyber sports players tend to change their teams or clubs as well as in regular sports, we constructed the network where nodes are sportsmen and weighted links between them indicate how long they play within one team. Closeness centrality was measured in order to find out whether successful in economic sense players are inclined to occupy a central position in the network. Overall, it was found that larger centrality in the transfer network link to high economic success. However, this relationship is moderated by players' region of origin.

The theoretical background behind this study concerns primarily, so-called, 'rich-club' phenomenon (Colizza et al. 2006, Vaquero and Cebrian 2013). It arises when 'rich' or successful nodes in a network tend to form connections with each other and, as a consequence, the network becomes more segregated. The core controls more and more resources, while nodes from the periphery are ignored. Another important theoretical concept is 'structural folds' which refers to nodes occupying positions in the overlap of cohesive groups (Vedres and Stark 2010). Such mutual participation in multiple cohesive groups provides unique knowledge and diversity for access and for action through the network topography. In other words, nodes in the structural folds have wider opportunities within network that makes them more successful.

The data for this study was extracted from Liquipedia¹ which is a crowd-sourced knowledge base dedicated to cyber sports. We use only information about Dota 2 players, namely, their origin, earnings, and transfer history. The data contain observations of 573 professional players' activities and earnings during the period from 2011 to 2016.

As the first step of our study, we built the transfer network (Fig. 1A) and found the relationship between players centrality and their earnings (Fig 1B). The results reveal that overall more central gamers who played with numerous counterparts from the core are likely to receive larger earnings, while they represent "rich-club" in cyber sports.

Moreover, we found that the network is highly clustered according to players' origin. The possible explanation of the observed trend is geographical: it is more convenient to train and

¹ http://wiki.teamliquid.net/dota2/Main_Page

play with a person who lives in a similar time zone. However, different regions shows slightly varying trend with respect to the main question of this study. On the one hand, the most successful European players belong to the network's core. In contrast, some of Chinese lucrative gamers form the network's periphery.

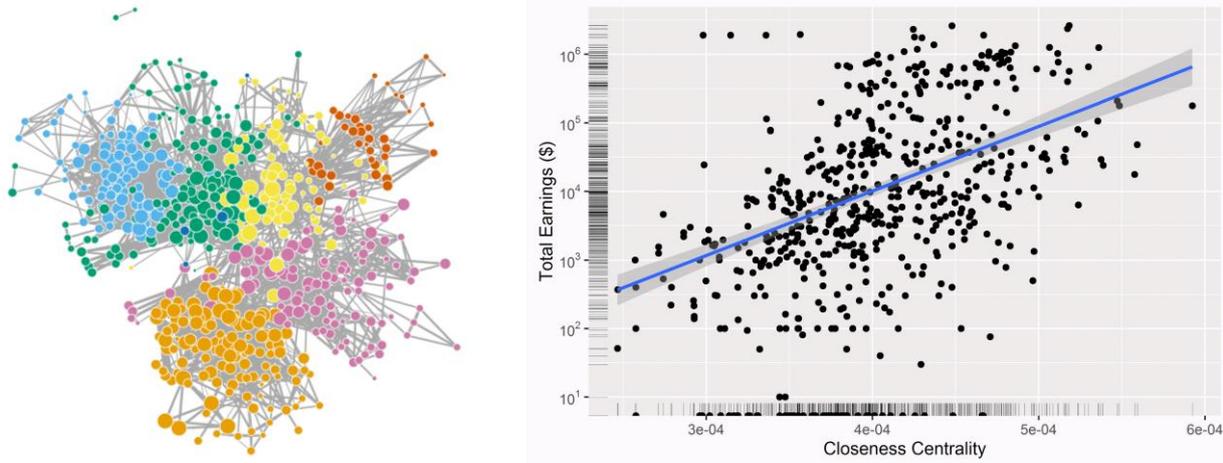


Figure 1. A — The transfer network in cyber sports. The size of nodes highlights player's earnings, the width of links reflects the duration of the same team membership, and the colour shows the region of players' origin (China, SEA, North America, South America, EU, CIS, Other); B — Closeness centrality of cyber sportsmen and their earnings

The second stage of our research was dedicated to understanding of how centrality is connected with economic success in different regions. We run regression predicting network properties by players' region, earnings, and interaction of these variables. In general, it was found that relationship between structural and economic features is moderated by region

(Fig. 2). For example, in Europe and South America the amount of earnings is associated with the position in the network stronger than in China or North America.

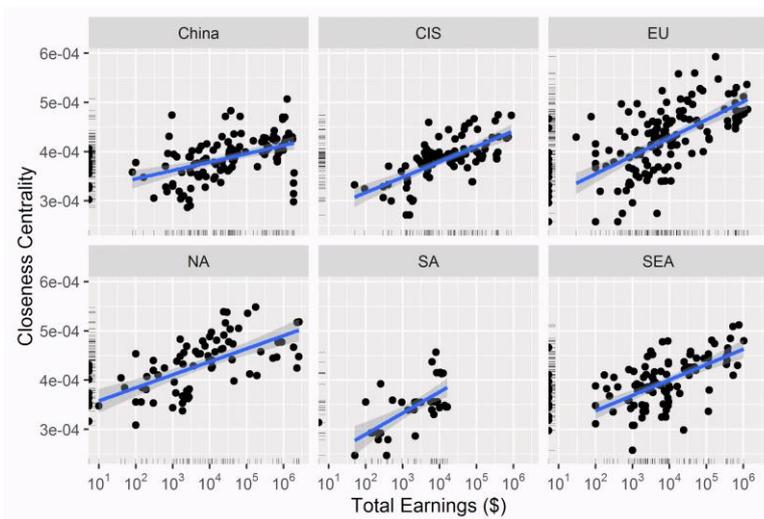


Figure 2. The relationship between cyber sportsmen position in the network and their earning by their region of origin

This outcome in case of China may be explained through the Chinese politics towards the professional eSport community. The organization called ACE Alliance was originally created in 2011 in order to protect newcomers to Chinese Dota2 scene from being

exploited. As a players' union ACE apart from protecting players' rights, control all transactions, transfers, contracts and player availability which significantly restrict their freedom in building connections with other communities. Therefore Chinese players are persuaded to play and master with Chinese teams (Tan 2014).

Despite the growth of industry emerged around cyber sports and the rise of data-driven studies based on comprehensive datasets produced by gamers, social science pays insufficient attention to this field. This study explored traditional question of economic sociology about the link between structural properties and economic performance on the case of Dota2 professional players. Our further work will imply answering this question in dynamics, hence, we are going to analyse what comes first: central position in the network or economic success.

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