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UNDERREPRESENTATION OF MINORITIES IN HOLLYWOOD FILMS: AN AGENT BASED MODELING APPROACH TO EXPLANATIONS

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ABSTRACT

This paper proposes an examination of the Hollywood labor system as a network using an agent based model (ABM) that creates a co-actor network within a movie labor market based on preferential attachment and compares the findings with 50 co-production ego networks during the 2015 movie cycle. Using ABM, the tested hypothesis is that slight individual preference for racial and ethnic similarity within one's own network at the microlevel sufficiently explains the phenomena of Hollywood racial minority underrepresentation at the macrolevel. Using regression analysis of the real-world co-actor networks the tested hypothesis is that minority status affects one's position within the network of successful actors. In both cases, the hypotheses are insufficient to explain the phenomena and this paper proposes further exploration into causes of opportunity loss in accessing the labor market merit further study.

1 EXTENDED ABSTRACT

The labor market for creative talent operates on a system of closed networks where individual worth is dictated by past commercial success. (Smith et al 2013) As such, can the basic parameters of this market combined with how individual choice operates within it explain the current state of minority underrepresentation? Schelling (1971, 1978) demonstrated computationally that benign individual preferences lead to significant system-wide inequalities. These preferences translate into homophily within one's own network. (McPherson et al, 2001) However, they are compounded by structural segregation along racial lines. (Massey and Denton 1993) McDonald (2011) examined how these two elements, homophily and structural segregation, restrict or provide access to social resources along gender and racial lines. His work concluded that how resources are accessible or not based on race was dependent on the types of resource.

In this study, the first test is the hypothesis: individual preference for racial and ethnic similarity within one's own network at the microlevel sufficiently explains the phenomena of Hollywood underrepresentation at the macrolevel. In order to create the necessary individual level heterogeneity of the persons in the labor market and to allow for success or failure of an individual's prestige in the market, agent based modeling is used as the approach to test this hypothesis. To further identify if real-world conditions exhibit the microlevel behavior of individual preferences in co-production networks, the second hypothesis explored is: race/ethnic minority status influences one's position within the co-production networks of successful actors.

The model is calibrated to be populated with a percentage of minority agents available to the market that mirrors that of the United States: 37%. Similarly, the model is calibrated such that the initial movie makers within the space to match the racial makeup of those in the real-world major motion picture studios: near 100% white, non-Hispanic. (Bunche Center 2016) To establish whether the results conform to the hypothesis or not, the results are compared to a network composed of the actors in the top ten movies of

2015 and their networks of actors based on the other 2015 movies they were cast. For this comparison data, The actor information is drawn from the Internet Movie Database (IMDB).

Within the model, the agents are embedded with a binary racial/ethnic attribute. The agents are either a race/ethnic minority or they are white non-Hispanic. The representation of different races and ethnicities in Hollywood movies is inherently part of a feedback loop about race, culture, and stereotypes. Two ways to explore this phenomenon would be 1) examining the underrepresentation of minorities and 2) examining the overrepresentation of white, non-Hispanics. The agents here are satisfied when a level of similarity is met. Here, the agents determine their satisfaction by whether the composite of the agents with whom they are directly linked conforms to the percentage desired for similarity. If it does not, they break links with individuals that do not also have their minority status. Success for the agents is measured by score. The score is derived from interaction between the agent and the movie space. To replicate the labor market, the cell space consists of a "movie space" and a "non-movie space." The success of a project is represented by the higher the score.

Next, the paper examines the real-world network of 2015 actors and the second hypothesis: race/ethnic minority status influences one's position within the co-production networks of successful actors. First, the network structure is examined in Gephi for correlations between centralities and race. Next, Gephi's modularity algorithm is applied to check for distinct communities within the network. There are 14 identified communities within the network. This again is an interesting finding as it is intrinsic to the work relationships of the actors in the network rather than reflective of any number of constructed communities in the data collection process. Finally, the multidimensional scaling (MDS) algorithm is used to identify the geodesic location of a node in relation to other nodes. (Algorithmics Group 2009) Then, a regression analysis is performed against the race dummy variable. Again, there was no relationship between race and the MDS location.

Based on calibration to real-world Hollywood labor market conditions with 180 runs of the simulation, no benign level of preference mirrored the level of underrepresentation of minorities in Hollywood. Segregation on a network due to individual preferences for similarity is insufficient to explain the current status of underrepresentation of minorities in Hollywood. Additionally, for individuals working in successful Hollywood films, racial/ethnic preferences are not correlated with an individual's network. This suggests structural impediments to the movie labor market should be explored to identify the nature and role of opportunity loss or denial for minority actors.

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