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Commentary

Evolution of Social Networks

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DESCRIPTION

Social network analysis is a survey of interaction patterns between social units. This field is receiving increasing attention from a variety of disciplines such as sociobiology, epidemiology, and behavioral ecology. An important sociological phenomenon that draws the attention of analysts is the emergence of communities that tend to gradually form, develop and collapse over time. Understanding this development is very important for sociologists and expert scientists and often leads to a better assessment of the social system under study. Therefore, it is imperative that social network visualization tools support this task. Graph-based representations are good for investigating the structural characteristics of a network at a given point in time, but they do not seem to be very useful when used to analyze gradual structural changes over a period of time. This post introduces an interactive visualization technique for dynamic social networks. The technology focuses on revealing community structures that emerge from the evolving patterns of interaction between individuals. The study also reports on a user survey conducted with the participation of behavioral ecologists working on social network datasets depicting wildlife interactions. The results of the user survey confirm that visualization provided answers to sociological questions and helped to elicit new observations about the social organization of the population under study.

Social environment

For most organisms, the social environment is an important choice as well as a new characteristic of their interaction. As a set of interactions between members of a group, the social environment is the product of many relationships and can therefore be represented as a network or matrix. An analysis of animal social networks is based on why these networks have their structure and whether individual network characteristics that represent certain aspects of their social phenotype are related to their health. Quantitative geneticists, on the other hand, have shown that traits expressed in social contexts can be dependent on the phenotype and genotype of the interacting partner. This leads to the impact of the social environment on individual traits and fitness, as well as on the evolutionary development of the population. Therefore, similar topics are explored in both fields, but these points are reached relatively independently. It shows that progress in one can affect the other, even if the theories are different. Network analysis techniques for quantifying social phenotypes and identifying community structures should be useful for people studying the relationship between individual behavior and phenotypes at the group level. By inputting a socially related matrix into a quantitative genetic model, it is also possible to reduce the bias of heritability estimation and estimate the effect of social connection on characteristic expressions.

CONCLUSION

Current methods of measuring natural selection in a social context explicitly take into account the fact that traits are not necessarily traits of a single individual. Understanding how the entire network of population social interactions affects phenotype using an evolutionary model that takes into account traits affected by the genes of other individuals (indirect genetic effects). However, it may predict how these traits will evolve. Through social network analysis and theoretical integration of quantitative genetics, we hope to identify areas of compatibility and incompatibility and direct research efforts towards the most promising areas. Continuing this integration provides important insights into the evolution of traits expressed in the social context and the evolutionary consequences of complex and subtle social phenotypes.

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