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INTRODUCTION

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The Journal of Mathematical Sociology (JMS) published a special issue on *Evolution of Social Networks* in 1996 under the responsibility of the two present guest editors. Gordon and Breach published in 1997 a volume that contained the original articles of the special issue together with three new articles (Doreian and Stokman, editors. *Evolution of Social Networks*, New York: Gordon and Breach, 1997). In the first JMS special issue and subsequent volume, a distinction was made between network dynamics and network evolution. We were primarily interested in studies that concentrated on the underlying mechanisms that induce network change. In other words, we were interested in network *evolution* and not only with network change. Partly as a consequence of this emphasis, most contributions in the first volume focussed on theory, methods, and simulation. In this respect, the first volume did not bridge the gap between theory and empirical testing. This induced our desire to edit a second volume on Evolution of Social Networks where *modeling and empirical analyses are integrated or at least combined.* The present special issue contains four of such contributions. A number of others will follow next year in the third special issue on the topic of Evolution of Social Networks.

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The article of Robins and Pattison provides a powerful statistical method for social network analysis by generalizing the p^* model to networks over time. Notwithstanding the complexity of the statistical model, they successfully embed their article in a broader theoretical context and provide arguments for why their method is of significance for the study of network evolution. The article is therefore also interesting for social network researchers who are less familiar with statistical methods. One of these broader perspectives is related to the question at which level of the network evolution takes place. They emphasize that the individual can be seen as the only intentional unit in the system, unless an outside authority can design the network. This implies that global systematic evolution properties have to be generated locally. Consequently, "such a systematic property reflects shared norms or behaviors across actors, norms or behaviors that could be construed as inherent in the particular social relation for this group of people". More implicit in their reasoning is a second implication, namely the importance of local structure for generating the global network. The latter justifies the orientation of their method to local social neighborhoods. Another interesting thought is related to their constant tie assumption: the stronger the tendency in evolution, the less change is to be expected over time. This makes empirical network evolution studies not only a tedious effort (for the researcher as well as for the subjects) but also a risky one: do we find sufficient change to explain network evolution? Also for this reason, the two illustrations in the article are well chosen: evolution of friendship ties in a well-established group versus the evolution of friendship and trust in a training group during a four days training course.

The fact that systematic network evolution is generated locally justifies the shift in emphasis of Doreian and Krackhardt from global balance in their 1996 contribution to triplets in the present contribution where they again use the well-known Newcomb (pseudo-dormitory) data. The concept of balance as applied to "group level" networks was based on a globalization of the concept of cognitive balance of Heider. However, Heider's concept is completely focused on one subject under study and the perceptions of that subject. These perceptions concern his or her relation to another subject, his or her relation to a third subject or object, and his or her perception of the relation of the other subject to the third subject or object. Under the assumption that the relation of the second subject to the third is perceived by the first subject as it is reported by the second, Doreian and Krackhardt focus on a count of triplets. If all three relations exists, the triplet can be categorized into eight categories, based on the sequence of "like" or "L" and "dislike" or "D" relations, starting from the subject under study *i*. All triples with an uneven number of D relationships are unbalanced. For the evaluation of the frequencies, they relate the frequency count to the expected value under a null model where the observed numbers of like and dislike relationships are distributed among the pairs under the uniform distribution. For all triplets starting with the L relation, the basic structural balance hypothesis is supported. However, the frequencies of the triplets starting with a dislike relationship deviate from the predictions based on Heider's theory. We would expect more balanced DLD and DDL triplets than expected, whereas they find substantially less. In contrast, the unbalanced triplets DLL and DDD occur much more frequent than expected. The authors give different alternative explanations for this finding. In one of the alternative explanations it is stressed that different network mechanisms operate simultaneously. In the Newcomb dormitory, large differences in popularity and unpopularity emerged that could have had strong effects on the frequencies of the triplet types, whereas the null model does not take these differences into account. It is one of the nice properties of the Robins and Pattison approach that effects can be estimated under control of others.

The Lazer study analyzes *selection* and *contagion* in an American bureaucratic organization, the Office of Information and Regulatory Affairs. Lazer's study is a nice example of a study of the co-evolution of individual characteristics and network structure. For the internal network in the office, Lazer is confronted with the problem of network stability that Robins and Pattison expect under strong systematic network evolution. The network was largely institutionally determined and showed less evolution than networks in an informal setting like that of Newcomb's dormitory. Lazer introduces the concept *network elasticity* for this phenomenon. He was fortunate that the external network was characterized by a much larger elasticity than the internal one. In the contagion part of his study, he is in a similar way confronted with the stability of individual characteristics, denoted the amount of individual *plasticity*. As the individuals who left the organization were unaffected by the change in milieu, Lazer questions the influence of the organizational network on the individual attitudes in the context of his study. In our opinion, the empirical investigation of selection and contagion effects is one of the most important topics in social network evolution. Lazer's study shows that they can only be studied in contexts where substantial network change is combined with substantial shifts in individual characteristics. We need theories and evidence in which domains elasticity and plasticity are to be expected. Lazer's study contribution does that. There is one parallel with the results of Doreian and Krackhardt: the identity of individuals who emerge as popular or unpopular is something that co-evolves with network structure.

Wittek also confronted the problem of large network inelasticity in the organization he analyzes. Nevertheless, the few relational changes have serious impacts on the positions of certain actors in the network. His contribution is particularly important for two reasons. First, he is dissatisfied with network theories that stress the importance of similarity of individual characteristics for network selection without a theory from which the relevant characteristics can be deduced. He does precisely that for trust relationships in a competitive environment. Second, he shows that just a few changes in relationships can have large effects on the position of individuals in the global network structure and on the global network structure itself. Wittek uses data from an organization for three time points. The management of the organization, in effect, created an informal experiment in which an individual present at the first time point, was removed for the second time point and returned for the third time point. Wittek's paper suggests that more stable settings are also interesting for network evolution studies.

We are confident that the four studies will inspire further social network evolution studies. We strongly believe that further progress in social network theories heavily depends on our creativity to studying and explaining both social network evolution and change.