NARRATIVE ECOSYSTEMS THROUGH THE NETWORK ANALYSIS LENS.
STEP ONE:
THE PRODUCTION OF U.S. TV SERIES, BETWEEN CAPITAL AND LABOR STRATEGIES

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ABSTRACT

This paper aims to present a first step in the investigation of the environment hosting narrative eco-systems through the tools offered by Social Network Analysis (SNA).
The narrative ecosystem paradigm is a cross-disciplinary approach that considers vast narratives as the result of an ecosystemic design, where a general model is developed in advance as an evolution-ary system. Consistently with this systemic view, our idea is to bring the relations among the com-ponents of the ecosystems and the environment that host them (i.e. the entertainment industry) to the fore through the implementation of SNA. In order to do so, we focused on the relational patterns characterizing a sample of 164 U.S. TV series aired between 1984 and 2013. For each one of them, we collected data on executive producers, broadcasters, production studios, actors and writers.
Through the analysis of the networks we obtained by com-puting the data, we drew some conclu-sions regarding the effectiveness of the ecological and evolutionary paradigm, the non-rigid and opportunistic patterns of alliances and coalitions among competitive firms, the relevance of the strategies of capital implemented by the firms and the strategies of labor implemented by the peo-ple.

INTRODUCTION

Considering the increasing relevance of vast narratives in contemporary audiovisual production, and focusing in particular on U.S. scripted TV series, Veronica Innocenti and Guglielmo Pescatore have developed the ecosystem paradigm, a cross-disciplinary approach to examine serial narrative forms as the result of an ecosystemic design, where a general model is developed in advance as an evolutionary system with a high degree of coordination among all its components (2012: 57-72). This exploratory paper is part of a larger project that aim to complement this paradigm by defining the environment that generates and hosts these *narrative ecosystems*, in order to account for those practices, policies and dynamics that affect and shape the design and evolution of the storytelling and its components.

Our main idea is that narrative ecosystems are generated and hosted by a broader environment that includes both production (networks, broadcasters, studios, actors, etc.) and consumption (viewers, users, fans, etc). Commercial strategies, along with individual choices and collective practices, can affect the products in many ways, pushing the narrative universes to adapt to the modifications, dynamics and needs of the external environment, therefore fostering a co-evolution of the involved and interlinked ecosystems. That is why we are going to adopt a systemic and non-linear approach in order to look for these possible patterns of co-evolution, more than just for deterministic relations between causes and effects. Coherently with this view, we have identified Social Network Analysis (SNA) as a powerful methodological approach, useful in disclosing the inner structure of the intertwined systems. In fact, SNA is not a novelty in studying the entertainment production systems, with significant value-added results.

The aim of this preparatory paper is to verify the real extent of the SNA approach, focusing on the relational patterns characterizing a sample of TV series, produced and aired from 1984 to 2013. The links are expressed as a participation of one or more broadcasters, studios and/or professionals (i.e. actors, writer,s producers – seen as "human productive factor") in two or more series. The existence of common resources between products is assumed both as an inter-firm cooperation strategy outcome, and as a possible personal "defecting choice" by a key personality, i.e. the result of a mix between capital and labor strategies, in a complex and partially self-structured environment.

1. THE THEORETICAL FRAMEWORKS

Our theoretical framework draws on two intertwined concepts: the ecosystem paradigm and the network approach, both encompassing a complexity view.

1.1 The Ecosystem Paradigm

The ecosystem paradigm takes into consideration a wide range of agents and factors, different from one another in their basic nature: producers, actors, audience, narrative elements, economic background, etc. (Innocenti and Pescatore, 2012). It is a complex and heterogeneous scenario where the TV series are the outcomes of the interplay among these elements and the environment they inhabit, just like a natural ecosystem. Given this complexity, that necessarily require a cross-disciplinary approach to the subject of study, the ecology metaphor naturally works as a proper and effective theoretical framework.

Obviously, we need to account for a basic difference between natural and narrative ecosystems: though they both attain to some regulatory principles, the former is based on *genetic* ones (the behavior of the agents is strictly codified, although subject to evolutionary pressures), while the latter is *rationality*-driven. In other words, narrative ecosystems have to deal with the social-economic teleology of agents (producers, actors, audiences); each one of them needs to maximize something – being it capital, revenue, career perspective, personal satisfaction or a mix of them all. According to these needs and goals, negotiations among parts are enacted, carried out and end up affecting the final products. That is why, in order to take into account the players' behavior, we need to add the concepts of *power* and *control* to the ecological metaphor, drawing on socio-political sciences and, in particular, to a model developed by economist Albert O. Hirschman (1970), which we find particularly suited for the matter.

Working on the responses of consumers in deteriorating quality goods, Hirschman developed the *loyalty, exit and voice model*. Basically, members of an organization have two possible responses to dissatisfaction caused by a perceived decrease in benefits from belonging to that group: from a state of *loyalty* to the organization, they can either *exit* (terminate the relation) or *voice* (communicate in order to fix, improve or change the relation). We find that this pattern can be applied to the subject of our analysis, as a starting point to map some industrial and social practices, tactics and strategies. Let's take the case of actors. From a state of *loyalty* represented by the

contract with the network or the studio, an actor can either exit through the termination of that contract, or *voice* through negotiations, which usually results into a production standoff. Once the deal is made, the situation can be restored back to *loyalty* (a new contract), or we can have an exit if the deal is not made. Both *voice* and *exit* can be used to identify and evaluate the crisis of a series, but if the narrative ecosystem is resilient enough, it should be able to recover.[2]

Similarly, we find that a *loyalty-voice-exit* model can be applied to audience as well. Serial products, as long-term narratives, require a high degree of consumers' *loyalty* in order to survive and to thrive. Nevertheless, they can also get very unstable, due to internal and external perturbations of the ecosystem. Viewers can simply decide to quit following the show: that is an *exit*. Fans, instead, could try to voice in order to express their disappointment in a network decision[3] or a precise productive and narrative strategy.[4] Like in the case of actors, depending on how things work out, fans can either go back to a *loyalty* status, or *exit*.

Once again, both *exit* and *voice* can be used to measure the health of a series in relation to its target audience. But, as

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2 For instance, in 2012, six actors of *Modern Family* (2010-present) caused the cancellation of a table read and tense weeks of negotiations over a salary standoff. A new deal was reached with producer 20th Century Fox Television, mainly because the actors had a high contractual power and the studio could not afford to lose all of their leading characters. Things can change in ensemble series like *Grey's Anatomy* (2005-present), where the presence of many characters and multiple storylines allows the production to be more flexible over cast turnover. For more details on the evolution of narratives in relation to productive factors, see Pescatore, Innocenti, Brembilla (2014).

3 In many cases, hardcore fans organized campaigns to protest against the cancellation of their favorite series. Some of them were successful, for instance *Star Trek: The Original Series* (1966-1969) was the first TV show saved by fans through a letter writing-blitz coordinated by sci-fi lovers Bjo and Joe Trimble. Others did not completely worked. More recently, *Jericho* (2006-2008) fans managed to buy their favorite series one more season by sending the network 20 tons of peanuts, a reference to the finale of the first season. CBS brought the show back for another short season, just to cancel it for good at the end of the year. The *Veronica Mars* (2004-2007) case is also well-known: a group of fans of the series, calling themselves "Cloud Watchers", organized several campaign both to bring more viewers to the series in order to ensure its continuation and then to save the show itself from cancellation. None of the campaigns worked. However, a few years later, a *Veronica Mars* film (*Veronica Mars*, Rob Thomas, 2013) was financed through a crowdfunding campaign on Kickstarter.

4 Viewers' feedbacks on forums, blogs or social networks can sometimes affect TV shows scripts. Writers and executive producers often refuse to read online comments on their shows – for instance, Bill Prady often reminds his fans on Twitter not to pitch him any idea for his show *The Big Bang Theory* (2007-present). However, sometimes they just can't ignore their voices: it is the case of *The Vampire Diaries* (2009-present), when creator Julie Plec and her writers' room had to work an idea into the script in order to solve a fans' question that persistently popped up on online threads. For more information, see Jannarone (2007).

Hirschman argues, there are also some important differences between the two of them: *exit* only provides the warning sign of a decline and, when it happens, it might be already too late for the series to recover. *Voice*, however, is more informative and provides reasons for the crisis. The interplay among *loyalty, voice* and *exit* is also extremely important: by providing greater feedback opportunities and by consequently showing an effort to adapt to the fans' needs or the actors' requests, *exit* could be reduced; conversely, a negative response or no response at all from the production side could lead to a direct *exit*. Broadcasters and producers can also carry out strategies to reduce the risks of *exit*, for instance by tightening up the contracts of actors or by leveraging on the value of brand loyalty for consumers. We therefore find that the *loyalty-voice-exit* model could work as a proxy between the two levels of production and consumption, providing the social-political frame we need in order to identify the dynamics of power and control that shape the narrative ecosystem.

1.2 The Network Approach

An ecological system (i.e., an ecological web) may be seen as a real complex network, object of several and increasingly interdisciplinary studies, aimed to understand the mechanisms that determine their topology (Réka and Barabási, 2002) and evolution. The network approach is operationally known as Social Network Analysis. Given its fitness to a wide range of areas, the SNA has been used to map and study relations among different agents in many contexts and disciplines, from chemical reactions to computer links, crossing economics, history, biology, and obviously anthropology and sociology. In psychology, a direct linkage between Ecological System Theory and SNA has been recently assumed both in a theoretical and practical perspective, as "a conceptual framework for understanding what ecological systems are and how they relate to one another" (Neal and Neal, 2013: 735). The network is a representational and computational paradigm, very robust and useful in modeling interdependent agents, shifting the epistemic focus from objects *themselves* to objects *as defined by their mutual relations*, which can be seen as structural constraints rather than informative connections. Consequently, the real object of the SNA are relational data, seen as information that cannot be reduced to the properties of the individual agents, but that can rather be seen as "properties of the relational systems of agents built up from connected pairs of interacting agents" (Scott, 2013: 3). Therefore, SNA is a useful approach to discover the

inner relational structures of production systems, in order to identify "those forms of social organization that now play the roles that were attributed to forms in the past (i.e. that act as independent units for decision making, optimization, etc.)" (Berkowitz, 1988: 265), typically characterizing the TV economics landscape.

In the world of movies and entertainment, SNA is a widespread approach, coherently with the large and inexpensive information availability provided by Web resources (i.e., IMDb www.imdb.com and AMG www.allmusic.com, not to mention the rich world of thematic social communities). A general literature review shows two main types of application fields: (1) the structure and dynamics of the production systems, and (2) the behaviors of the online social networks engaged in reviewing movies. As for the former, we refer to the seminal work of Fass *et al.* (1996), usually known as the *Six Degrees of Kevin Bacon Game*. In this network, the nodes are the actors, and two nodes have a common edge if the corresponding actors have acted in a movie together. Based on the *Small Worlds Theory* and the *Six Degrees of Separation* concept (Milgram and Travers, 1969; Newman, et al., 2001), the Game assumes that any individual involved in the Hollywood film industry can be linked within six steps, through a role played in a film, to actor Kevin Bacon. The so-called Bacon-number of an actor or actress, is his or her number of degrees of separation from Bacon and its computation creates a co-stardom network. The movie network shows a non-random structure: the average path length of the actor network is close to that of a random graph with the same size and average degree (3.65 compared with 2.9), but its clustering coefficient (the measure of the degree to which nodes in a graph tend to cluster together) is more than 100 times higher than a random graph (Watts and Strogatz, 1998). That explain the "strange property" of many networks to support a relevant connectivity between nodes/actors, also with a very low density (number of links per node).

The same approach applied to the creative artists who made Broadway musicals from 1945 to 1989 (Uzzi and Spiro, 2005) and to pop musicians (Park et al., 2007), shows small world properties as relevant resources affecting their creativity and performance. Following Uzzi (2008), it is very important to observe the relevance of clustering coefficient (strongly depending on the network topology), compared with the simple relational degree of each actor. The author found "a nonlinear association with the production of financially and artistically successful shows. When the clustering coefficient ratio is low or high, the financial and artistic success of the

industry is low, while an intermediate level of clustering is associated with successful shows". The organizational form prevail over the single actors' position and creativity is successfully enhanced by a "middle-coupled" environment.

Cattani and Ferriani (2008), referring to the context of the Hollywood motion pictures industry,[5] have come to a similar conclusion. Creativity at an individual level appears shaped by the position occupied by the single agent in the social-productive network: specifically, individuals who occupy an intermediate position between the core and the periphery of their social system are more likely to achieve creative results.

Another important organizational dimension explored by SNA is related to international co-productions (ICP) in film industry. Shichijo (2012) – using IMDb, combined with the Motion Picture Producer Association Japan database, Korean Film Council database, and all-cinema database (http://www.allcinema.net/) – has explored all the 11,767 feature films produced from 1970 to 2007 in Japan, China and South Korea, which included 7,658 professionals either as director, directors of photography and screen writers. Following the author, "the experience of joining in ICP affects the centrality of professionals in social networks within each country's social network. [...] The social capital formation rate according to the degree of film-making experience is higher for ICP experienced professionals than non-ICP experienced professionals. This suggests ICP effect not only economically beneficial but also beneficial on fostering talented professionals".

In short, all the papers we have seen support a relevant hypothesis: the structure of the social-productive system is a critical factor in defining the characteristics of the entertainment products (movies, musicals, songs), acting on the "creativity-resource", not only ascribed to the genius of the author/actor, but specified in terms of position in the network, and even more in its own topology.

On the social side, several scholars explored the effectiveness of SNA in studying the structure and behaviors of the audiences. Fatemi and Tokarchuk (2012), referring to a wide set of movies and their reviewers collected from IMDb, showed a power law topology, consistent with the general Internet structure (Réka and Barabási, 2002). Only few movies reviewed present a very high degree in the network (link from/to other movies, by the common reviewers). As the au-

5 The data consist of the entire population of core crew members who worked in at least one of the 2,137 movies distributed in the United States by the eight major studios (Universal, Paramount, Warner Bros, Columbia-Tristar, Disney, 20th Century Fox, and Metro-Goldwyn-Mayer), plus Dreamworks Pictures and their correspondings.

thors claim, "the observed result suggests that the structure of the IMDb network is a social graph with number of small tightly clustered communities held together with nodes with high degree."

Krauss *et al.* (2008) explored online forum discussions on IMDb by examining the correlation of the social network structure with external metrics such as box office revenue and Oscar Awards. They observe that discussion patterns on IMDb (a network characteristic) could predict Academy Awards nominations and box office success. A similar approach is carried out by Doshi et al. (2010), who worked on the prediction of movie prices using a sentiment analysis tool representing the general buzz of the movie from the Web and the bloggers, assumed as unconscious signals about popularity.

As for the audiences, treating media networks as a set of media outlets connected by the audiences that overlap among them, Ksiazek (2013) traced large-scale patterns of media use.

As we have seen, movie production systems and social forum activities can be attributed the same structure: both of them are based on small-world/power law topology and a significant correlation is observed between social behaviors and market performances. In terms of narrative ecology, all those evidences reinforce the evolutionary perspective, based on an emerging relation between structure (network topology, role and positions of the actors) and outcomes (movie and musical features). Finally, the richness and, at the same time, the complexity of the IMDb universe is assumed by other authors as a promising field to develop more user-oriented techniques of visualization and graphical analysis (Ahmed *et al,* 2007; Shen *et al.,* 2006), useful in representing the structural intricacies of the entertainment production systems.

2. THE ANALYTICAL MODEL AND ITS PRACTICAL RESULTS

2.1 A Basic Model

Using the ecological metaphor, a TV series may be seen as an "organism" necessarily susceptible to coherence constraints towards the environment where it lives. If we assume that TV series are correlated, in their narrative structure, to the production environment, the characterization of the whole network set becomes very useful. In this view, regarding both the nature of the theoretical assumptions and to the data

features, we propose a "first step" general model (table 1), showing the basic interrelations between three logical and operational categories: the TV series, the firms and the single professionals involved in the TV production business. In SNA terms, six kinds of networks can characterize this universe:

- two "TV series networks", respectively expressed by co-appearance of professional people and by producers' co-participation;
- similarly, two "producers networks", respectively coordinated by co-produced series and by people allocated in there;
- obviously, two "professional networks", respectively bound by at least one common TV series and by a common firm.

Each pair of networks is not necessarily isomorphic, the internal differences representing both a specific strategic choice of the firms (assuming risks, capital and/or sharing "on contract" human resources) and of the people (following the employer's strategy or defecting and acting against it). Cooperation and defecting schemes may play a role in maintaining/transferring some characteristics within the TV series, which in turn can be assumed in itself as a highly structured narrative networks, depending to (and, at the same time, organizing) their environment. Verifying this hypothesis, demands an extensive network modeling activity, concerning all of the system's layers.

In practical terms, the available public data allowed to build only four networks (the complete pairs of TV series, the producers and the people via TV series), since the direct links between producers and professional are not available in a reliable way.
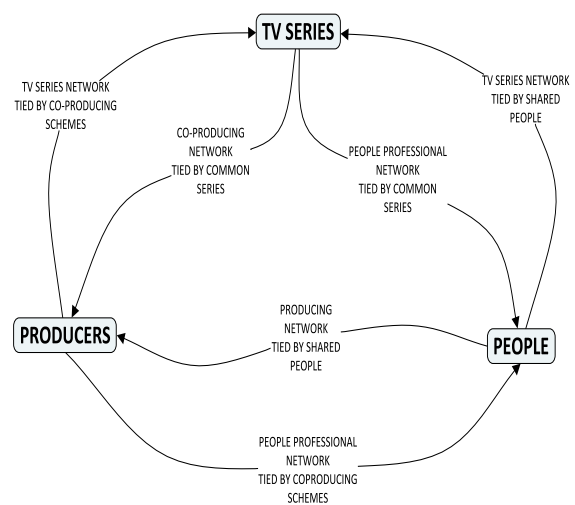

TABLE 1. A SIMPLE, PRELIMINARY MODEL

2.2 TV Series Sample, Data Handling and Network Building

We have adopted, in a smaller-scale, the same approach used by Uzzi (2008) to analyze the Broadway musical industry, narrowing the data collection only to Internet database, without using any other complementary source (as – in the Uzzi's work – direct interviews). The data have been drawn from DBPedia Live and IMDb. The former is considered the semantic web mirror of Wikipedia and it is an open platform that allows users to extract and reuse structured content from Wikipedia, therefore querying relationships and properties associated with Wikipedia resources. We chose DBPedia as the main source because of the automation in data harvesting, but we then needed to manually integrate its data with the information provided by IMDB which, more specialized and complete, ultimately worked as an adjustment filter. The sample includes 164 TV series, produced and aired from 1984 to 2013. In this 30-years spanning period of time, the TV industry has certainly undergone changes and evolutions (for instance, the affirmation of pay cable and the quality TV economic and aesthetic model). However, it is also true that these decades present a rather steady competitive environment, composed of broadcast players (the networks) and cable players (both basic and premium) only. In fact, the major competitive upheavals brought about by the launching of the over-the-top players (OTTs) original programming, seem to occur either right in 2013 or after 2013, and are therefore excluded *a priori* from our sample. Furthermore, some of the most resilient and long-standing practices are those steering the products and labor exchanges – i.e., networks and professionals will sell, buy and sign deals according to a mixture of contingent commercial and creative factors. We therefore believe that this sample could work on a broad level in depicting some ground rules of the scenario.[6] That being said, the series selection criteria, oriented by their typological representativeness, is based on the shows' success in terms of popularity, as known by online evaluations (such as the IMDb metrics) and hit-names' relevance. For instance, we included *666 Park Avenue* (2012-2013) although it was canceled after only one season, but it is nevertheless considered high-profile because of the hit-names involved. Some British series are also included, since they present a certain relevance in the U.S.

market thanks to exchange and co-production relations. For each series, we collected data on executive producers (301), broadcasters (25), studios (140), actors (1.399) and writers (54).

After structuring the vectors, we organized data into two bipartite graphs, a "TV series by companies involved in their production" network and a "co-stardom" network, where the two types of nodes correspond to actors/writers and series. Edges exist, only with a dichotomic value, if the nodes have a relationship ("actors in a TV series"). Through a simple cross-product, we obtained four 1-mode matrices, in which the rows and columns refer to the same kinds of objects and the link are undirected and weighted by the number of common occurrences in the original 2-mode matrix:

- the "TV series network by common companies", expression of the intentional cooperation strategies between firms;
- the "TV series network by professional co-appearance", expression – in an unknown ratio – of the interplay between firms and personal strategies;
- the "Co-stardom network by common TV series", the social and professional structure involved in writing, directing and playing fictions;
- and the "Co-production network by common TV series", representing the sum of the single alliances and cooperation schemes underlying the sample.

The methodological choice to use the 1-mode matrices instead of the original 2-mode is consistent with the model shown in Table 1, as well as with the models adopted by the authors cited in the previous pages. Although possible (i.e., in historical perspective, Borgatti and Everett, 1997), the direct analysis of the bipartite graph does not fit the analytical model shown in table 1. Furthermore, the direct approach is not necessarily better than a "conversion approach" (that we have used), since "dual-projection analysis methods are generally safe to use and often have conceptual advantages over direct methods (and in many cases can be used to obtain the same results as direct methods)", as the same authors clearly argued in a recent critical paper (Everett and Borgatti, 2013).

2.3 The TV Series Networks, Between Company Cooperation and Professional Participation

The TV series network based on companies shows some interesting topological properties. At first glance, we can easily detect a giant component (151 nodes), combined with 11

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6   However, we do not rule out the possibility to work further on it, either by including more years to the sample or by fragmenting it into decades, so to build an evolutionary comparison among them. Potentially, this could be one of the next step of this research project.
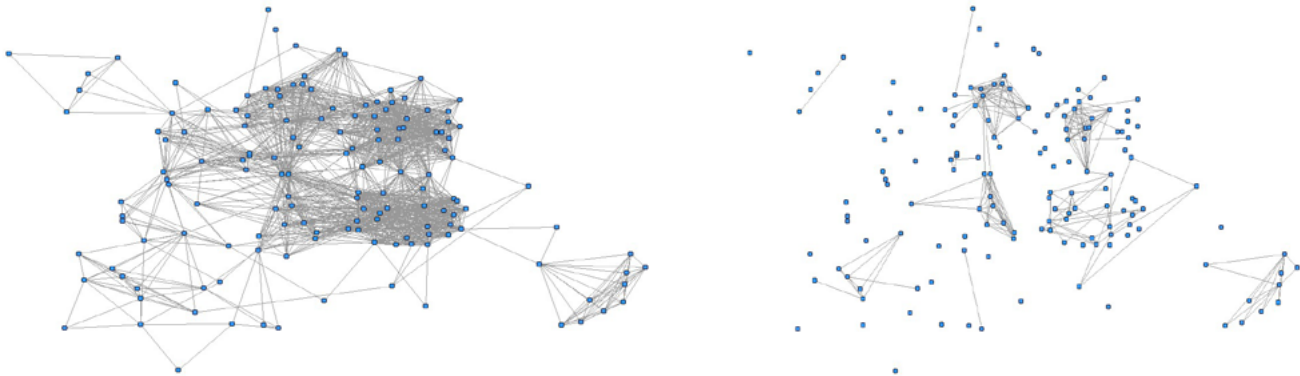
TABLE 2. TV SERIES BY COMMON COMPANIES – MAIN COMPONENT

isolated single TV series and a micro 2-nodes network. The main component (Table 2, upper picture) shows small world properties, presenting a low density (0.167), matched with a clustering coefficient one size bigger (1.024 not weighted), an average geodesic distance of 2.7 and a binomial (Poisson-like) degree distribution. The net is clearly structured in a "core/periphery" model (Girvan and Newman, 2002). The main part of the edges (84,4%), presents a mere value of 1, which means the greatest part of TV series are connected only by one common company. A simple dichotomization at the edge value >1 (namely discarding all the links weighting 1 dramatically simplify the network (Table 2, bottom picture), highlight its inner structure, organized in 12 independent subnet, two of them linking about 30 TV series each one. This is the entire set of co-production cases. A further dichotomization produces a severe loss of information.

Already at this first analytical step, the TV series appears to be linked by two distinct connective logics. The first and widely spread logic is the productive behavior of the single companies, 40% of them producing 2 or more (just to 29) series each. It is the widespread "1:more" ratio to generate the greatest part of connections between products, therefore the relative closeness representing the membership to the same strategic control. But the whole network structure, and mainly its width and the small-world properties, is due to the presence of a second type of connective logic: the co-producing schemes between two or more companies, whether in the same chain of control, or – and that is the most productive situation – representing a real risk-sharing between two or more majors. The cross-sectional nature of the sample over a significant period of time causes an accumulation of these cases, not so frequent in itself, bearing the so wide continuity of the network. In an evolutionary, ecosystemic metaphor,

the few "bridges" between endogenous and homogeneous subgroups of products may act as a potential crossbreeding factor, reducing the transitional costs and enhancing the learning-by-interacting opportunities. The cohesiveness of the TV series world is the outcome of a mix of cooperation/competition strategies, structuring the products in to a set of interacting or interdependent components forming an integrated system.

As we have seen, a second TV series network can be produced taking, as a link generator, the common professionals (actors, writers, producers, etc.). In this case as well, we obtained a giant component (Table 3, left picture) in the same magnitude order of the previous one (137 nodes), followed by 24 isolates TV series and one autonomous small network, 3 nodes wide. The principal net shows different properties: density is significantly reduced (0.033, one one order lesser than the previous network) and so is the clustering coefficient (0.325 not weighted); the average geodesic distance is 4.2, much more than in the previous case. The structure is not hierarchical and the degree distribution is rather log-normal like. Following a dichotomization at the edge value >1, the network breaks up in 35 isolates nodes and 12 small networks (Table 3, right picture), only one of them more than 5 nodes wide.

The first comparison between the two networks, within the methodological limits, suggests two types of evidences:
- in both cases, the clear presence and the weight of the giant component confirms the structural role assumed by the shared resources. TV series, seen in a cumulative, diachronic view, are not a simple whole of disconnected instances, but an organized world, in which the links may allow a dynamic cognitive interactions, potentially operating on formats, aesthetics and audiences' perceptions;

TABLE 3. TV SERIES BY COMMON PROFESSIONALS (ACTORS AND OTHER HUMAN RESOURCES)

- at the same time, the coordination schemes are quite different, the shared companies carrying out a more relevant contribution to the whole connectivity and a more defined topology than the shared professionals.

A reliable way to draw a structural comparison between the two networks consists in analyzing their logical product, via the AND operator: the new network only holds the links presents in the same time in both the sources. The initial 164

TV series fall off to 78, 30 of which present themselves as isolated nodes. Only 48 TV series set up 11 fragmented networks, the most relevant of 28 and 21 nodes wide (Table 4). Therefore, less than a half of the sample shows a double coordination mechanism: by common companies and by shared resources. Both the networks present a near-linear backbone structure, with a relevant diameter, crossing and integrating some local micro sub-networks.

Interestingly, though we know that professionals figures such as actors and writers tend to frequently move from one production to another, by observing the TV series in Table 4 we can infer that the coordination mechanism by common professionals still revolves around the big broadcasting networks (the so-called 'Big Four', ABC, CBS, NBC, FOX, plus The CW), that actually structure the backbones of the network. In other words, all of the series composing the network belong to one of the Big Four plus The CW, or to one of their own-and-operated cable stations. On the one hand, its is clear that contracts are the main reason for this structure, especially when it comes to the sub-nets. In fact, long-term productions often require deals that bind professionals to a certain show or a
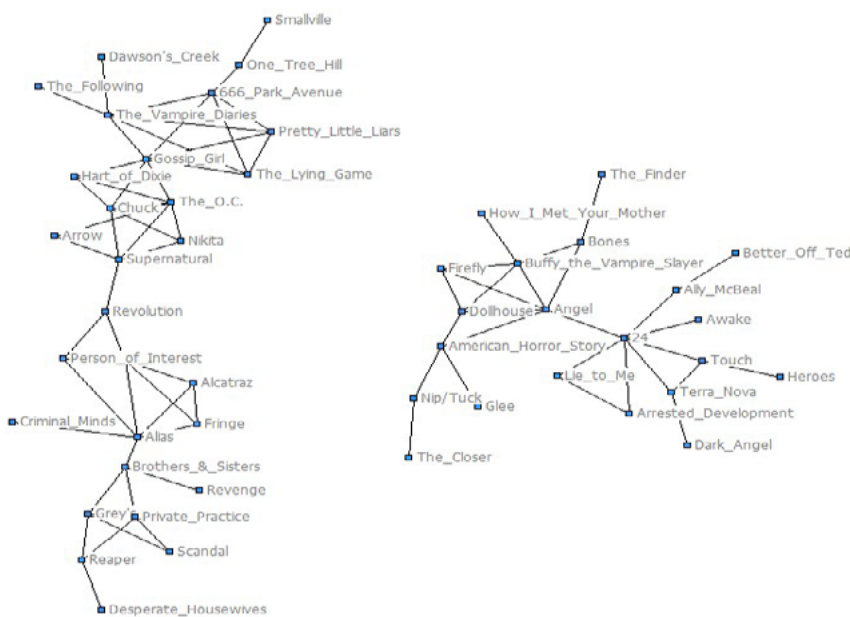

TABLE 4. THE MORE RELEVANT SUBNETS SHARED BY THE TWO
TV SERIES NETWORKS

package of in-house productions for several years, even decades. On the other, and that is less obvious, we can also note that these same human assets tend to keep on moving mainly from one TV network to another, even if the broadcasters are potential competitors.

In an attempt to better understand the interplay between companies' rationality and people's behaviors (seen as proxy for "labor v. capital" strategies), it is useful to examine the TV series network made up only by the professionals working in two or more shows, across the sample time span. As shown in table 5, a giant component dominates the landscape, with three minor networks. On the whole, a very relevant amount of series (124 out of 164, equal to 75,6% of the sample) share one or more professionals each other, without any common company. The main component present a very reduced density (0.023) and, for the first time, a similar clustering coefficient (0.024). Consequently, the average geodesic distance reach the value of 5.4. The core of the net is non hierarchical and only a little vulnerable by deletion of single nodes. The network does not show any typical topology.

However, observing again the TV series appearing in the network, we could speculate about a qualitative trend. The crowded central cluster is in fact mostly made of broadcast network series (e.g. *Grey's Anatomy, 24, Buffy the Vampire Slayer, Desperate Housewives*...) that have proven to be the forerunners of certain innovative aesthetic styles and narrative formats (Innocenti and Pescatore, 2008, Mittell, 2014).

These series also look like central nodes from which several links originate. Ultimately, these links lead to the edges of the network, where we mostly find cable shows that are usually evaluated and reviewed as 'edgy', 'transgressive', 'quality' (e.g. *Girls, The Newsroom, True Blood, Curb Your Enthusiasm, Episodes, Californication*...), an overall qualitative improvement from the usual broadcast network shows. We could therefore argue that once know-hows, competences and perhaps a certain recognizability attached to his or her name are acquired, professionals tend to move from the most central and critically underrated part of the industry (the big broadcast networks) to the critically acclaimed periphery. However, we deem it necessary to acknowledge that there are exceptions to this rule (for instance, the presence of quality benchmark *Mad Men* at the center of the network), meaning that the hypothesis should be further investigated.

Definitely, the inner structure of the TV series world is a complex mix of two kinds of rationality, with a different impact force, composing a "porous" system, coherent with diffusive processes. The wide part of the series is deeply embedded in this environment, with a relevant proximity in terms of shared resources and, most likely, opportunities both of self-structuring and hybridization. This "articulated compactness" may also support the audience perceptions towards a really specific narrative genre. All these characters are consistent with the ecosystem paradigm, supporting the experimental SNA approach.
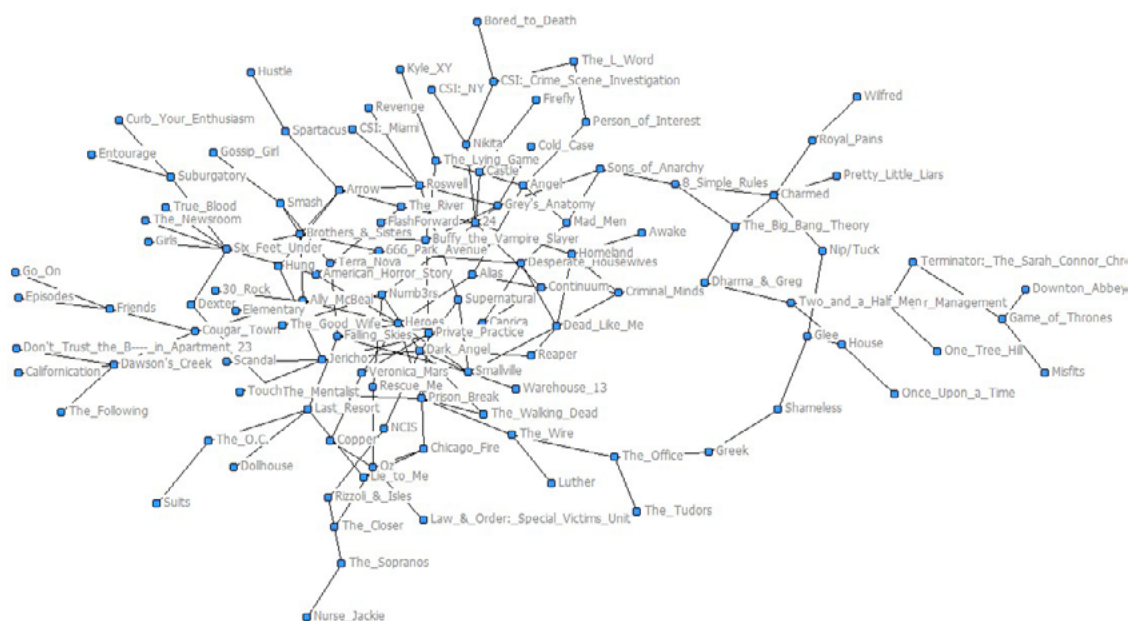

TABLE 5. THE TV SERIES NETWORK DEFINED ONLY BY PROFESSIONAL BEHAVIORS

2.4 The Productive Forces: Companies and Professional Networks

By affiliation from 2-mode matrix "TV series/companies" we obtain three companies networks, as usual organized in a giant component (121 cases) and in two micro instances (9 cases in all). Only 10 firms remain isolated.

The first and more substantial research object presents a low overall density (0.061), matched with an impressive clustering coefficient (1.692), the highest in all the available datasets. The average geodesic distance is not very short (3.4), representing the "star-based" component. The node's degree distribution is Pareto-like, showing signs of heavy tail. The network is highly structured around a few relevant companies, with a huge coordination power, represented by the betweenness centrality proxy[7]. The use of different algorithms shows a consistent pattern of sub networks, clearly correlated with the more central nodes.

In table 6 we can observe that the most important broadcasters (in terms of market value) are the biggest nodes of the network and, more in detail, they are the ones belonging to a big media conglomerate (they are indeed the afore-mentioned "few relevant companies").[8] As of the overall structure of the network, it is interesting to note that the most detached part of the network includes the premium cable HBO ecosystem, which actually looks detached from the rest of the TV industry environment. It is not only about premium TV vs. broadcast television, otherwise Showtime would be as much detached. Nor it has to do with proprietary independence, since HBO belongs to Time Warner Inc., which looks as an important node of the massive part thanks to Warner Bros. Television. Thinking about the overall HBO business strategy, funded on the dismissal of television traditional contents and aesthetics in favor of what has been defined a cinematic quality television (Akass and McCabe, 2007), we can see how the network graphically represents the actualization of the strategic catchphrase "It's Not Television. It's HBO". Therefore, it seems that HBO does not only detach ideally from the rest of the TV environment, but also effectively through the employment of specific and exclusive resources.

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7 "An actor is central if it lies between other actors on their geodesics, implying that to have a large "betweenness" centrality, the actor must be between many of the actors via their geodesics" (Wasserman Faust: 188). A geodetic is the shortest path from all nodes to all others, that pass through the node object of measure; the betweenness centrality measures the number of geodetic paths for each node. The higher the betweenness centrality, the higher the probability that the node play a coordination, relay or power role in the network.

8 For instance, HBO, HBO Original Programming and Warner Bros. Television belong to Time Warner Inc., NBC and Universal Television belong to Comcast NBCUniversal, ABC Studios belongs to The Walt Disney Company.
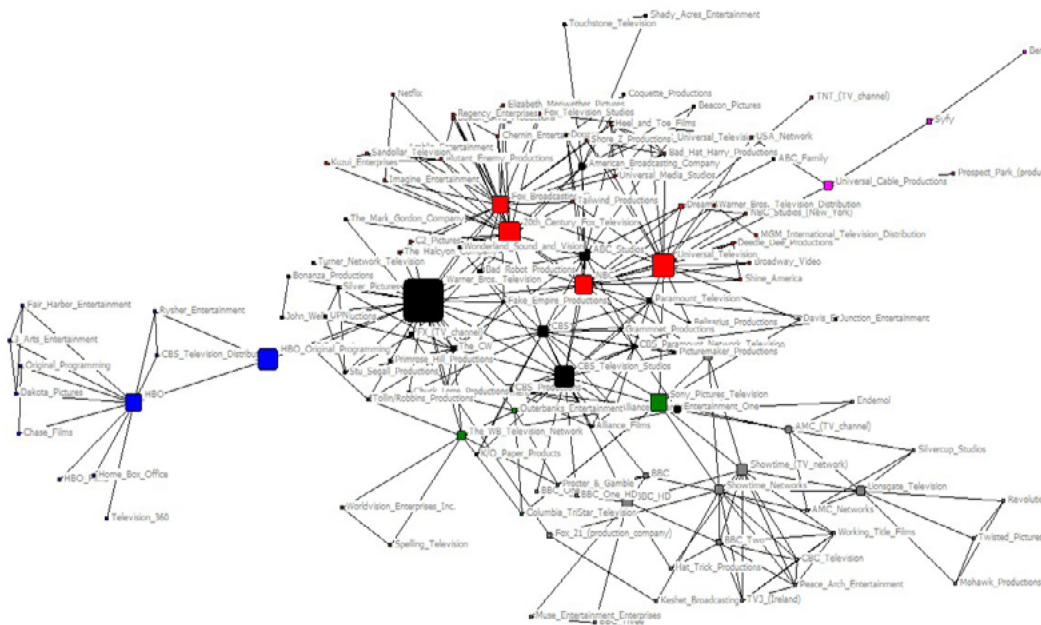

TABLE 6. COMPANIES BY COMMON TV SERIES, WITH BETWEENNESS CENTRALITY MEASURE – MAIN COMPONENT
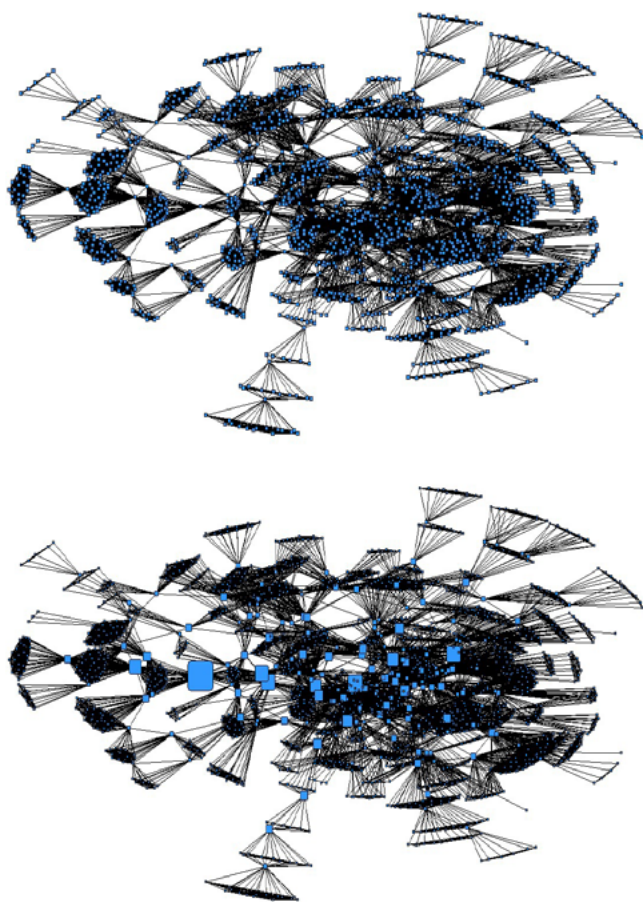
TABLE 7. PROFESSIONALS BY TV SERIES- MAIN COMPONENT

Also, the network represents clearly, although partially, the result of the strategic mix between cooperation (opportunistic) and competition, emerging from a cumulative view across the temporal span of the sample.

Quite different is the professional network, made up by affiliation of 2-mode matrix "TV series/professionals". The 1,869 peoples are organized in 21 different small networks from 2 to 36 nodes and in a giant component made up by 1,682 nodes (90% of the people in the sample). In all, only 11% of the people have more than one participation in a TV series. However, at first sight (Table 7, left picture), the TV series environment appears as a rather cohesive space. The usual characterization of the more relevant network shows a very low overall density (0.012), combined by a relevant clustering coefficient (0.942 not weighted), a long geodesic average distance (5.4) and a log-normal like degree distribution. Only 203 peoples (12% of the whole network) present a betweenness value greater than zero (Table 7, right picture, the dimension

of the nodes being proportional to the measure), distributed in a strongly asymmetric way: 13 case sums up 25% of the total betweenness; 40 cases the half.

The cohesive property of the network is clearly due to a few professionals, having typically two or few more participation in series. A naive glance at the pictures already shows the inner connections logic: each "fan-shaped" sub-net represents people that are mutually involved in the same TV series; the single sub-nets are linked to each other by a single actor, with the partial exception of the core part of the network, showing a reinforced pattern. In this specific topology, higher betweenness values comes from a "legacy effect": the nodes involved are the intermediate connector of a sub-nets' chain, organized in a star-like shape: in this position, the node is crossed for a relevant number of geodetic path, without that implying a strategic role in the network. On the one hand, a strong betweenness is more the result of a chance-effect over the time span, than the outcome of an actor's rational choice; on the other hand, the individual opportunities to "migrate" from a TV series to another (for personal reasons, rather than for a company's strategy) present a potential structuring effect on the whole professional system.

The result is consistent with the outcomes of a recent work of Gallos et al. (2013) which, in reference to an IMDb subset, shows the topological importance of the links strengths over a large period of time, and the subsequent transition from a small-world to a long tail, power law structure. Finally, shifting from one series to another is a highly individual movement: no other people are involved. The professional network is very far from a possible "communities-of-practice" model (Wenger 1998) and no specific sign of "strength of weak ties" (Granovetter, 1973, 1983) are detected. After the first step dichotomization only 54 nodes survive. A clear confirmation of the scarce network deepness.

REMARKS AND (OPEN) CONCLUSIONS

This paper aimed to present a first step in the investigation of the environment hosting narrative ecosystems through the tools offered by SNA. Given what we have seen so far, we are able to draw three main points.

First, from an ecosystemic standpoint, the high degree of connection among the networks and their overall structures, support the idea that we are dealing with an ecological model. This model is characterized by practices and dynamics of radiation, reciprocal influence and interdependency. The

environment looks weakly structured (at least from the hierarchical point of view) and, as such, it is apparently adaptive and inclined to forms of evolution.

Second, though the structure of U.S. TV industry is certainly an oligopoly from the proprietary standpoint, the networks account for non-rigid and opportunistic patterns of alliances and coalitions. Some main nodes remain central, but the structures around them change according to different strategies and relations.

Thirds, the graphical representation of the networks highlighted two main strategies. The first one, that we have named *strategy of capital,* is employed by companies and centers on the management of financial and human assets in order to produce a successful product. At this point, we account for relations of co-production that seems to be more occasional, rather than actually based on structural alliances – which mostly occur, instead, when we talk about proprietary relations. Furthermore, some series work as 'connectors' in the network. In some cases, this appears to be a result of isolated episodes of cooperation among producers, which proves consistent with the concept of opportunistic coalition. The second strategy is what we have defined *strategy of labor,* since it is mainly based on the individual choices of people. However, given the scattered form of the networks, we can assume that these strategies are not grounded on "communities of practice" and not much regularly repeated. It is likely (even if not yet proved by a proper research on specific cases of contracts and deals) that individual choices prevail over external or hetero-directed choices made by the companies. It is in fact interesting to notice that capital strategies networks are not isomorphic with work strategy networks, therefore proving that there is no structural alignment between the two strategies. This lack of isomorphism could affect the narrative universe in what Innocenti and Pescatore call the "perturbations" of the ecosystem (2012: 68). These perturbations have to do with institutional decision (e.g. a changing in the programming slot) or exceptional events such as the 2007-2008 Writer's Strike or a defection of a cast member, which inevitably end up affecting the storylines, bringing to the fore the *loyalty-exit-voice model* we used as a proxy in the theoretical framework.

These remarks lead us to some more considerations on the combination of SNA and a general ecosystemic approach. Our work resonates with the idea that the narrative ecosystem paradigm, being inherently composite, is like a puzzle: it needs a wide and diverse range of approaches, hypothesis, tests, studies, examinations that, brought together, form a broader picture. In this context, our contribution shed some lights on the relational dynamics of the industry, proving the existence of an ecological model, of opportunistic patterns and strategies that, although different by nature, share the need to maximize the subjects satisfaction. Therefore, the drawn networks offered a general description of the topologies of the environment containing the narrative ecosystems, rather than providing clear-out rules of how these nodes and links directly contribute or determine the existence of a TV series. In order to do so, we necessarily need to integrate this model with specific case studies and qualitative analysis. For instance, Pescatore, Brembilla and Innocenti (2014) argued that the most resilient ecosystems are those able to endure and to adapt to internal and external upheavals thanks to their inherently ergonomic nature. For instance, the series *Grey's Anatomy* has carried out a successful selective evolution for more than ten years now, "mainly thanks to a setting that allows to remove and introduce new characters and storylines according to internal or external needs – a decline in ratings, the defection of actors or other exceptional events." (2014: 3). In this case, given what we have seen so far, we ourselves could argue that series like that benefit from the opportunistic nature of the industry relations: this flexibility could cause upheavals in case of a main actor defection, but the ensemble nature of the show, i.e. the low incidence of the professionals with a significant betweenness centrality and the absence of a "community of practice" topology, could also result into an increased resilience in terms of cast turnover. This is why we strongly underline the exploratory nature of this paper, wishing for further investigations and collaborations.

So far, we have drawn some general conclusions on the depicted productive scenario, though single cases prove to be interesting and worth of further, in-depth analysis – such as the peculiar position of HBO emerging for table 6.

As for the next steps, on the one hand, before deepening our analysis through the introduction of new factors (i.g., the time-factor), we deem it opportune to make interpretative hypothesis based on external factors (for instance, types of broadcasters, TV series genres, etc), in order to better define the object of study and to verify its expected features. On the other, we will retain the *Loyalty-Voice-Exit Model* for the consumption side as well, keeping in mind that we need to adopt a different approach to the analysis from this other standpoint. The general idea, in this case, would be to map the mutual exchanges among production, audiences and fan communities in order to complete the definition of the external environment of the TV series' single ecosystems.

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