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MAKING MODELS OF CONTEMPORARY SERIAL MEDIA PRODUCTS.
GUEST EDITED BY MARTA ROCCHI

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SERIES has two main purposes: first, to respond to the surge of scholarly interest in TV series in the past few years, and compensate for the lack of international journals specializing in TV seriality; and second, to focus on TV seriality through the involvement of scholars and readers from both the English-speaking world and the Mediterranean and Latin American regions. This is the reason why the journal's official languages are Italian, Spanish and English.

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INDEX

EDITORIAL

NARRATIVES / AESTHETICS / CRITICISM

DIALOGUE

EDITORIAL

INTRODUCTION: MAKING MODELS OF CONTEMPORARY SERIAL MEDIA PRODUCTS

MARTA ROCCHI

Considering the contemporary mediascape, the abundance of both media products and analytic tools can be an interesting challenge. Several techniques have been developed for analyzing data contained in digital collections, such as tools for collecting data, text mining, geographical mapping, image analysis, network visualization or audience measurement approaches (Ross et al. 2009, Smith and Telang 2016). Scholars and industry-based researchers must identify which tools exist, get acquainted with their capabilities, and decide which one is more suitable for their purpose. However, there are some obstacles that separate the traditional researcher in media studies from the use of modeling methods, such as "the required knowledge of computational technology and of different research methods, in particular statistics" (Noordegraaf 2016: 55). These factors create "a gap [..] between the affordances of digital data and computational tools, and their application in media studies, despite the growing number of successful experiments in this area" (Noordegraaf 2016: 52).

Traditional approaches in media studies focus on specific elements of analysis such as evaluations of style and narrative form, economic and production studies, and audience analyses. One of the challenges of studying long-running television dramas can be capturing a clear "picture" of textual trends, production issues and audience response over time. Like studying an extended corpus of fiction, such as the body of

SERIES VOLUME V, Nº 1, SUMMER 2019: 05-08
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work that comprises a national literature, long-running television series provide much more material than a close-up view can incorporate. If we consider qualitative and quantitative models as simplified representations of complex phenomena, they might help us organize and structure information, clarify our reasoning, communicate, solve problems and predict events. This last question is central. While quantitative models give us information about the magnitude of variation, and are based on a quantitative representation of the system, qualitative models inform us about the direction of change and maximize generality and realism at the expense of precision. Both modeling approaches might be a potentially fruitful way to answer some challenges in the contemporary mediascape.

Recently, Hennig-Thurau and Houston (2019) propose the use of *Entertainment Science* to overcome the problematic implications hidden in both approaches represented by the traditional "Nobody-Knows-Anything" mantra and the data-driven "new way", which argued that big data and complex analytics can function as an alternative to gut-feeling-based decision-making process for entertainment products. They suggest combining the use of data analytics with powerful theories in *Entertainment Science*. Theory needs testing, and this issue proposes some modeling methods to grasp different aspects related to serial media products.

The aim of this collection is to develop, and promote discussion of, qualitative and quantitative methods, in addition to more traditional ones, for studying television series. Indeed, a methodological hybridity characterizes media studies, which seeks to expand the investigatory frameworks of the phenomena of interest, situating them within the entire media system (including production, distribution and consumption) and their social, cultural and political contexts. In this perspective, adopting qualitative and quantitative modeling approaches can create an interesting perspective and enhance the development of future research fields. For example, in the study of individual programs, or particular sites of production, consumption, and reception, or of audience response, modeling approaches might help to identify textual and contextual features that correlate with the persistence of particular programs over time; the ability of particular shows to adjust their form or market appeal in response to changing contextual conditions; and the ways in which different production, distribution, or exhibition contexts influence textual form and/or audience response.

This issue of *SERIES* will offer some examples of both new (three of the articles are defined by their authors as a "pilot study") and innovative, under-utilized tools that may point towards future applications of qualitative and quantitative models in media studies. Let us take a closer look at how the articles contribute to the special issue.

Hunter's opening contribution, "Predicting Nielsen Ratings from Pilot Episodes Scripts: A Content Analytical Approach", analyzes pilot episode scripts of 183 new dramatic American series appearing on the four major networks in the US. He extracts several descriptive statistics by applying content analysis or using information contained therein, and demonstrates that script-based factors such as "originality", the creator's "track record of success", and "cognitive complexity" can be useful to predict Nielsen [18–49] ratings over the first five episodes of the first season of each series.

Qualitative modeling technique is the centre of "Insights into serial narratives through qualitative modelling techniques", where Rocchi and Chiarello propose a new point of view in the analysis of serial narratives through the use of loop analysis. The methodology was developed in an ecological context, and the authors adapted it by first identifying the steps to the narrative context and then focusing on a specific case study. The focus is on the last season of *Game of Thrones* and the main aim is to connect the narrative domain to the economic one in an evaluative/predictive perspective.

Lazzaretti analyzes the British television drama *Downton Abbey* by applying corpus linguistics methodologies. In her article "'I've been nowhere and done nothing': The characterization of Daisy Mason in the British drama *Downton Abbey*", she investigates the characterisation of Daisy Mason, a fictional secondary character of the series, based on episode transcripts of the first three seasons. She associates relevant aspects of the character personality with typical features of her speech, which are compared with those of other characters to explore how language is used to create the character identity.

In her article "An Introduction to Network Visualization for Television Studies: Models and Practical Applications", Taurino focuses on the use of network visualizations for humanistic research. She discusses the related challenges in adopting visual model as a data-discovery process, and suggests that network visualization might be the key for observing the relations (e.g. institutional, industrial, cultural) underlying television series, and offers an overview on the methodological path to its use. Two anthology series (*Black Mirror* and *The Twilight Zone*) are taken as practical applications considering them in three different ways: television series as networks, as nodes of the network, and as links.

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Finally, in "Video Scene Segmentation of TV Series Using Multimodal Neural Features", Berhe, Barras and Guinandeau use artificial intelligence methods to propose an unsupervised automatic scene segmentation for TV series in order to extract and understand their narrative structures. The method is tested using *Game of Thrones* and *Breaking Bad*. Using an unsupervised method to extract and study narrative structures of serial narratives is valuable because it might allow the immediate use on other products.

In general, the articles of this special issue on Making Models of Contemporary Serial Media Products contribute to the field of media studies in various and interesting ways. Obviously, the most important level is the methodological one, because the articles represent a research area that engages with innovative and heterogeneous approaches to the study of TV series. Perhaps the greatest contribution of computational research in media studies is that it invites a clear articulation of the theoretical approach, the chosen method, and the selection of sources and means of analysis.

For future work, it would be interesting to extend some of these perspectives to additional ones in order to discover patterns, trends, or characteristics of serial television that would otherwise not be straightforward, such as processing textual objects through the use of automated software (Konstantinos and Giannakopoulos 2016); analysis of social discursivity among communities of spectators and fans by using digital tools – such as large data sets obtained online and from social media and analyzed through automated software (Hoffman et al. 2018); and evaluation of production and consumption processes through social network analysis.

On behalf of the authors and editors, I wish the reader an inspiring experience. We hope it will promote future research that will further integrate and develop the application of under-utilized tools for building both qualitative and quantitative models to the study of serial media products.

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PREDICTING NIELSEN RATINGS FROM PILOT EPISODE SCRIPTS: A CONTENT ANALYTICAL APPROACH

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KEYWORDS
Pilot episode; script; screenplay; television; television series; television ratings; Nielsen ratings; statistical analysis; panel data; regression analysis; content analysis; network analysis; semantic network analysis.

ABSTRACT
Textual and content data were extracted from the pilot episode scripts of 183 new, dramatic television series appearing during ten consecutive seasons—2008/9 through 2017/8—on the four major American broadcast networks—ABC, CBS, Fox, and NBC. These data were used to predict the 18-49 demo ratings for the first five episodes of each series' first season. As expected, the *originality* of a series' premise, the *track record* of success of the its creator(s), and the *cognitive complexity* of its pilot episode script each explain a statistically significant proportion of the variance in the Nielsen ratings over the first five episodes.

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1. **INTRODUCTION**

Every year in the middle of May, US television network executives converge on some of New York City's most prestigious venues for an event known in the trade as the "Upfronts" (Sobieck 2008). Among the most anticipated highlights of this event are said executives' announcements of their networks' programming schedules for the upcoming season, one which commences in earnest less than four months later.

Upfronts are also important because it is during this time that that these networks sell the majority of their advertisement inventory for the coming season (Sereday and Cui 2017). Given the large sums of money and commitments of resources that such transactions represent, all parties involved have strong economic incentives to accurately predict the performance of the forthcoming series. Over the last few decades, a wide variety of forecasting models have been developed and deployed—both by academic and industry-based researchers—to meet this pressing need, especially as it pertains to predictions of Nielsen ratings (Danaher, Dagger and Smith 2011).

In this pilot study, we emphasize the impact of three variables on one type of Nielsen rating—the 18-49 Demo—in a sample of 183 new dramatic series appearing on the four major broadcast networks (ABC, CBS, Fox, and NBC) during the ten most recently-completed seasons, i.e. the 2008-09 through the 2017-18 seasons. Those three variables are (a) the originality of the series' premise (b) the track record of success of the series' creator(s) and (c) the cognitive complexity of the pilot episode's script. Each of these variables has been shown in prior research to explain significant variation in several measures of performance of new, dramatic television series airing on major broadcast and cable networks (Hunter and Breen, 2017; Hunter, Smith, & Chinta, 2016). As expected, we find that each of these three factors explains a statistically significant proportion of variance in ratings *between* series.

2.1 **Literature Review**

Two groups of academic researchers have developed early-stage prediction models for film and television projects. Both groups rely on content analysis—using both human and machine coding—to extract a wide range of contextual and textual factors for subsequent investigation. Eliashberg, Hui and Zhang (2014) extracted several such factors from screenplays, many of which explained significant variation in box office and/or return on investment in a sample of 300 feature films. Among the more than two dozen factors they incorporated into their analysis were the average dialogue length, the film genre, the concentration of dialogue, the presence of a strong nemesis, and the familiarty of the setting.

Hunter, Smith and Singh (2016) extracted a different set of textual and content factors from a sample of over 170 feature-film screenplays, each of which explained significant variation in opening weekend box office. The key variables were the *originality* of the story's premise, the *track record* of the screenwriter, and the *cognitive complexity* of the screenplay itself.

Subsequent research investigated how these same three variables impact the study of the performance of new dramatic television series appearing on the four major broadcast networks (Hunter et al. 2016; Hunter, Smith and Chinta 2016; Hunter and Breen 2017). Performance outcomes explained by the three variables included the number of viewers (Hunter et al. 2016; Hunter, Smith and Chinta 2016) and the number of episodes in the first season as well as the likelihood of being renewed for a second season (Hunter and Breen 2017). To date there has been no examination of Nielsen-derived data as outcomes (performance measures). The aim of this analysis is to test whether the same variables that were previously used to predict several measures of TV series performance can also predict Nielsen ratings, the "gold standard" of series performance (Sereday and Cui 2017).

2.2 **Hypotheses**

Several recent studies by Hunter and colleagues (Hunter, Smith and Chinta 2016; Hunter et al. 2016; Hunter and Breen 2017) reported that the originality of a premise has a positive and statistically significant impact on the subsequent success of new, dramatic TV series. These measures included number of viewers per episode (Hunter, Smith, and Chinta 2016) and the number of episodes in the first season (Hunter and Breen 2017). In these studies, an original premise was one which credits no prior art, i.e. is not derived from pre-existing intellectual property such as other televisions series or franchises, novels, musicals, short stories, comic books, musicals, stage plays, etc. Nielsen ratings—the proprietary, and most-widely-used, metric for US television audience size—are widely accepted as the strongest leading indicator of the likelihood that a series will stay on the air (Sereday and Cui 2017; TV Series Finale 2019). Although none of these studies used Nielsen ratings as their measure of success, the relationship between ratings and other measures of success motivates the first hypothesis:

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H1 All else equal, an *original premise* will be positively associated with the Nielsen ratings of a new dramatic series.

The same studies referenced immediately above also found a positive and significant impact from the track record of a series' creator(s) on its subsequent success. Specifically, they reported that new series from creators with at least one renewed series to their credit would have larger audiences than new series from creators with no renewed series to their credit. Notably, these findings paralleled research in the film economics literature which found that the prior performance of actors, directors, and screenwriters positively predicted box office (Goetzmann, Ravid and Sverdlove 2013). As such, our second hypothesis is that:

H2 All else equal, a strong creator track record will be positively associated with the Nielsen ratings of a new dramatic series.

Cognitive complexity is a construct common in the psychology literature. Two of its most common definitions are "the number of independent dimensions of concepts that an individual brings to bear in describing a particular domain of phenomena" (Scott 1962: 405) and "the number of independent constructs a person uses in perceiving and interpreting the environment" (Tinsley et al. 1983: 94). In the aforementioned studies by Hunter, et al, concept networks were constructed from selected words and concepts in the screenplay of the pilot episode script. The size of that network was their proxy for cognitive complexity. They also reported that measure to be very positively and significantly correlated with the success of new dramatic television series. Our third and final hypothesis is that

H3 All else equal, the cognitive complexity of the pilot episode screenplay will be positively associated with the Nielsen ratings of a new dramatic series.

3. **METHODS & DATA**

This analysis utilizes text- and content-based factors extracted from the pilot episodes of new dramatic series appearing on the four major broadcast networks over the 10 most recently-completed seasons, i.e. the 2008-9 through 2017-8 seasons. Excluded from consideration were series that had "*back-door"* pilots, e.g. *CSI Cyber* (2015); that premiered as *two-hour TV movies,* e.g. *Fringe* (2008); that were *anthology or event series*, e.g. *Law & Order: True Crime* (2017);that were exclusively *foreign-produced* series, e.g. *Crusoe* (2008); that premiered *without a pilot episode*, e.g. *Agent Carter* (2015), that moved to an *online platform* immediately after the network premiere, e.g. *The Good Fight* (2017), or that had a pilot episode broadcast in a *different season* than the second episode, e.g. *Glee* (2009).

Of the 193 series that remained, 183 (95%) had pilot episodes that could be incorporated into this analysis. The main sources for pilot episode scripts were the *TV Writing* blog (sites.google.com/site/tvwriting/) and the online screenplay broker *Scriptfly* (scriptfly.com). The ten pilot episode scripts that were not located and thus not included in the analysis are *The Ex-List* (2008), *Alcatraz* (2012), *Law & Order: Los Angeles* (2010), *Agents of Shield* (2013), *Once Upon a Time in Wonderland* (2013), *Super Girl* (2015), *Inhumans* (2017), *9-1-1* (2018), and *The Gifted* (2017). A complete list of these series included in the study is available upon request from the author.

3.1 **Dependent Variable**

The outcome measure for this study is the same-day "18-49 Demo" rating as provided by the Nielsen company. As its name suggests, the rating estimates the number of adults aged 18-49 watching an episode of a certain series and it is generally deemed to be more important than the total number of viewers (Storey 2009; Carter 2010). That's because the 18-49 demo is the one used to determine how much a network will charge for advertisements to be seen during commercial breaks (Santiago 2007).

Ratings data was located from various online sources including, but not limited to, *TV By the Numbers* (tvbythenumbers.zap2it.com), *TV Series Finale* (tvseriesfinale.com), and *The Futon Critic* (futoncritic.com) websites, only for the first five episodes of the first season of each series. Thus, our dataset is in the format of panel. That is to say, it contains ratings obtained for multiple, distinct time periods for the same series. Because seven series were cancelled before the fifth episode had aired—*Ironside* (2013), *Lucky Seven* (2013), *Lone Star* (2010), *My Generation* (2010), *The Playboy Club* (2011), and *Wicked City* (2015)—the panel is slightly unbalanced.

3.2 **Predictors**

The following factors were extracted from pilot episode scripts via content analysis or were inferred/calculated using information contained therein.

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ISSN 2421-454X

3.2.1 Originality of Concept

A categorical variable entitled "ORIGINALITY" was coded "0" if the series' Wikipedia page and/or *Internet Movie Database* (IMDb) page identified pre-existing source material upon which the series was based, e.g. a film, another TV series, a novel, a comic book, etc. and coded "1" otherwise.

3.2.2 Track Record

A categorical variable entitled "TRACK RECORD" was coded "1" only if one or more of the writers of the pilot episode script had previously written the pilot of one or more series that had been renewed for at least one full season, i.e. 20 or more episodes, and coded "0" otherwise.

3.2.3 Cognitive Complexity

In its continuous form, cognitive complexity was equal to the number of links in the main component of a semantic network constructed from the text of the series' pilot episode script. More specifically, the greater the number of links in the semantic network, the greater the cognitive complexity. Across the sample, the average number of links was 110.2 with a standard deviation of 46.6. The max was 293 links in the semantic network of the pilot episode script of CBS series *SEAL Team* (2017). Other pilot scripts with very large semantic networks included those for *Hawaii 50* (2010) with 272 links and *Scorpion* (2014) with 226 links. The smallest network—with only 8 links and thus the least cognitively complex—was that for the musical *Smash* (2012). Other pilot scripts with fewer than 30 links in their semantic networks included those for *Chicago Fire* (2012), *Harper's Island* (2008), *My Generation* (2010), and *Extant* (2013).

In the regression analyses below, the categorical variable entitled "Complexity" was coded "1" if the number of links was greater than 133, a number which marked the thirtieth percentile of the sample, and "0" otherwise. Detailed information on the processes by which screenplays were converted into text networks can be found in the appendix.

3.3 **Covariates**

Six co-variates not examined in prior research studies were also included in this analysis.

3.3.1 Female Show Creator

A categorical variable entitled "FEMALE" was coded "1" only if one or more of the writers of the pilot episode script were females and code "0" otherwise.

3.3.2 Length of First Act

Following Calvisi (2016), a measure of the length of the first act or "teaser" was created with a categorical variable that was coded "1" only if first act of the screenplay claimed 25% or more of the total pages of the pilot episode script and coded "0" otherwise.

3.3.3 Other Covariates

Five other non-content related variables were used in the statistical analysis that follows. These was one for each of the four major broadcast networks—ABC, CBS, Fox, and NBC. Specifically, a variable "ABC" was Coded "1" only if the series appeared on the *American Broadcasting Company* "ABC" and coded "0" otherwise. A variable named "CBS" was coded "1" only if the series appeared in the *Columbia Broadcasting System* (CBS) and coded "0" otherwise. Another named "FBC" was coded "1" only if the series appeared on the *Fox Broadcasting Company* (FBC) and coded "0" otherwise, and one named "NBC" was coded "1" only if the series appeared on the *National Broadcasting Company* (NBC) and coded "0" otherwise.

Finally, because Nielsen ratings are in a decade-plus long downtrend, I included a two-digit variable named "Season" to represent the year of the television season in which the series debuted, e.g. "16" for shows debuting at any point in the 2016-17 season or "09" for any series debuting at any time in the 2009-10 season, etc.

3.4 **Descriptive Statistics**

Table 1 contains descriptive statistics for the variables included in all subsequent statistical analyses. Bi-variate correlations among the three keys variables—originality, track record, and cognitive complexity—were all less than 4% and none were statistically significant. Specifically, the three bivariate correlations—*Originality-to-Track Record*, *Originality-to-Complexity*, and *Track Record-to-Complexity*—were -3.3% (p= 0.33), 3.8% (p=0.25) and 2.3% (p=0.48), respectively. One notable correlation was the significant and negative one

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TABLE 1. DESCRIPTIVE STATISTICS

Variable	Mean	St. Dev	Min	Max
Log (18-49 demo)	0.140	0.241	-0.699	0.785
SeasonYear	12.85	2.74	8	17
Original	0.653	0.476	0	1
Track Record	0.209	0.407	0	1
Complex	0.283	0.451	0	1
Sum	1.146	0.780	0	3
Female Creator	0.241	0.428	0	1
Long First Act	0.383	0.486	0	1
ABC	0.312	0.464	0	1
CBS	0.230	0.421	0	1
NBC	0.277	0.447	0	1
FBC	0.181	0.386	0	1
Episode #	2.978	1.414	0	1

found between female creators and cognitive complexity ($p<0.001$, two-tailed). In other words, pilot episode scripts including one or more female writers had significantly lower cognitive complexity.

4. **RESULTS**

Two multiple regression models were specified in order to analyze the effect of the above-described variables on the 18-49 demo ratings over the first five episodes of the first season of the183 new dramatic series in our sample. For the panel data we specified a set of generalized least squares (GLS), random-effects regression models. To estimate the effects on individual episodes I specified a set of ordinary least squares (OLS) regression models. Table 2, below, contains results of the former while Table 3, also below, contains results for the latter.

4.1 **Results of Panel Data Regressions**

The first model includes only control variables—the season year, female creator, female lead, the length of the first act, and three network variables—ABC, CBS, and NBC. The model explains almost 35% of the variance *between* series and none of the variance *within* series. That means that these variables explain why some series have higher ratings than others but nothing about decline of ratings across episodes for a given series. Somewhat as expected, there is a strongly negative coefficient associated with the year, indicating thereby that 18-49 demo ratings are declining with each passing year. I also find that series from female creators have significantly lower ratings ($b=-0.071$, $p<0.05$, 1-tailed).

Models 2-4 add the three variables of interest—originality, track record, and cognitive complexity—and/or combinations thereof. In Model 2 we see that each of these variables are statistically significant at the $p<0.05$ level or better. From Model 3 we can see that the sum of these three factors is even more statistically significant, ($b=0.066$, $p<0.0001$). In Model 4 we see that when all three variables were absent—not original, creator had no track record, and script was not cognitively complex—then ratings were again significantly lower ($b=-0.135$, $p<0.0001$).

In Model 5, the episode number and its number squared were added to the regression in Model 4. Both variables are very highly significant ($p<0.001$) and all other variables retain their relative level of significance as shown in Models 1-4. The important difference is that the two episode-related variables explain 54% of the variance *within* series and none of the variance *between* them. Put another way, the episode number is the best predictor of how much ratings of any series will decline over time but tells us nothing about why ratings differ between series.

4.2 **Results of Episode Regressions**

The results of the episode-specific regressions, as shown in Table 3, evidence a similar pattern. Specifically, the year of the series debut is the most statistically significant, and, as before, negatively so. Every control variable that was statistically significant in the panel regressions is also significant here. Notably, the model for the 3rd episode was the strongest both in terms of the percentage of variance explained (39.6% overall, 37.1% adjusted) while the model for the 4th episode is where the statistical significance of the key predictor was the greatest ($b=-0.144$, $p< 0.001$, 1-tailed).

4.3 **Summary**

The above results confirm that series with higher ratings were more likely (a) to be original rather than adapted (b) to be written by creators with strong track records of success and (c) to be more cognitively complex. In addition, combinations of these three factors were associated with even more significant differences in ratings.

The average 18-49 Demo ratings for the third episode of these series was 1.04 versus 1.62 for the rest of the sam-

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TABLE 2. RANDOM-EFFECTS GENERALIZED LEAST SQUARES REGRESSION WHERE DEPENDENT VARIABLE IS THE LOG OF "18-49 DEMO" NIELSEN RATINGS

Variables	**Model 1**	**Model 2**	**Model 3**	**Model 4**	**Model 5**
Season Year	-0.040**** (-7.65)	-0.042**** (-7.83)	-0.041**** (-8.03)	-0.039**** (-7.54)	-0.038**** (-7.52)
Female Creator	-0.071* (-2.16)	-0.054* (-1.65)	-0.059* (-1.83)	-0.065* (-2.02)	-0.062* (-1.92)
Long First Act	-0.074** (-2.49)	-0.070** (-2.40)	-0.069** (-2.40)	-0.050* (-1.69)	-0.056* (-1.88)
Network = ABC	-0.085* (-2.07)	-0.091* (-2.28)	-0.091** (-2.29)	-0.101** (-2.51)	-0.102** (-2.55)
Network = CBS	-0.049 (-1.13)	-0.074* (-1.72)	-0.072* (-1.69)	-0.076* (-1.78)	-0.073* (-1.70)
Network = NBC	-0.086* (-2.04)	-0.095* (-2.32)	-0.095** (-2.33)	-0.094* (-2.29)	-0.093* (-2.27)
Original		0.052* (1.79)			
Track Record		0.071* (2.26)			
Complexity		0.078** (2.61)			
Sum			0.066**** (3.92)		
Sum =0				-0.135**** (-4.15)	-0.126**** (-4.16)
Episode					-0.110**** (-13.13)
Episode*Episode					0.011**** (7.99)
R-squared (within)	0.0%	0.35%	0.40%	1.2%	54.0%
R-squared (between)	34.6%	39.5%	39.3%	38.5%	37.4%
R-squared (overall)	30.1%	34.1%	33.9%	33.4%	40.3%
Wald Chi-squared	92.8****	114.5****	115.3****	115.3****	933.3****
N (observations)	893	893	893	893	893
N (series)	183	183	183	183	183

Note: regression coefficients are unstandardized

ple—a 56% difference. Also, the first seasons of these 37 series were 40% shorter. In addition, not one of them achieved a full first season (measured as 20 or more episodes) and only one went on to a full second season—*Lethal Weapon.* Not surprisingly, many more of these series than average had their cancellation announced before the last episode aired, were rescheduled to another day and/or time slot or were pulled from the altogether after just a few episodes.

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TABLE 3: ORDINARY LEAST SQUARES REGRESSION WHERE DEPENDENT VARIABLE IS LOG OF "18-49 DEMO" NIELSEN RATINGS

Variables	**Episode 1**	**Episode 2**	**Episode 3**	**Episode 4**	**Episode 5**
Season Year	-0.036****	-0.041****	-0.039****	-0.037****	-0.041****
	(-7.18)	(-7.90)	(-7.40)	(-6.65)	(-6.59)
Female Creator	-0.067*	-0.064*	-0.065*	-0.075**	-0.058#
	(-2.11)	(-1.96)	(-1.97)	(-2.14)	(-1.51)
Long First Act	-0.061*	-0.035*	-0.057*	-0.057**	-0.064*
	(-2.08)	(-1.14)	(-1.85)	(-1.73)	(-1.76)
Network = ABC	-0.109**	-0.102**	-0.107**	-0.086*	-0.113*
	(-2.76)	(-2.50)	(-2.56)	(-1.92)	(-2.30)
Network = CBS	-0.106**	-0.071#	-0.085*	-0.058	-0.071#
	(-2.50)	(-1.62)	(-1.91)	(-1.22)	(-1.37)
Network = NBC	-0.094**	-0.078*	-0.107**	-0.108**	-0.104*
	(-2.32)	(-1.87)	(-2.53)	(-2.39)	(-2.09)
Sum = 0	-0.078*	-0.111**	-0.141****	-0.144****	-0.122**
	(-2.26)	(-3.15)	(-3.88)	(-3.72)	(-2.83)
Model R-squared	35.7%	37.8%	39.6%	36.6%	33.2%
Adjusted- R-squared	33.1%	35.3%	37.1%	33.9%	30.4%
Root MSE	17.8%	18.3%	18.3%	19.4%	21.3%
N (observations)	183	183	178	176	175

Note: regression coefficients are standardized

5. **CONCLUSIONS**

The models described in this paper do not explain ratings of all types of American television shows. Rather, they demonstrate only that variance in an important subset of them—new 1-hour dramatic series, which are a mainstay of American prime-time programming—can be predicted with some accuracy from factors contained in or derived from the pilot episode scripts. While that finding generally comports with prior research, to our knowledge, no other research has demonstrated a link between any script-based factors and Nielsen ratings.

Perhaps the most counter-intuitive of our findings concern the originality hypothesis—counter-intuitive because the results in the film industry are exactly the opposite. Specifically, our earlier work on film performance (Hunter, Smith and Singh 2016), as well as that of Basuroy and Chatterjee (2008), hypothesized and reported that sequels, re-makes, and adaptations were associated with significantly *higher* box office returns. However, the results do comport with our prior findings on televisions series which found originality positively associated with the number of viewers per episode (Hunter, Smith and Chinta 2016) and the number of episodes in the first season (Hunter and Breen 2017). That said, it is worth recalling the that results for originality were statistically the least powerful of the three hypothesized variables.

Two new results not reported elsewhere or in our previous work are the negative impacts of longer opening acts and the negative impact associated with female creators. The former result is consistent with predictions of script analysts writing in the professional screenwriting literature, e.g. Calvisi (2016) who argue for short, compelling, opening acts. The latter finding, however, has no precedent of which we are aware. There are many possible explanations for the finding concerning gender and ratings. One possibility concerns the apparent interaction of genre with both gender and ratings. Specifically, in this sample, female creators are significantly under-represented in the action genre ($r = -0.21$, $p < 0.0001$), one which is strongly and positively correlated with both Nielsen ratings ($r = 0.11$, $p < 0.01$) and with cognitive complexity ($r = 0.21$, $p < 0.0001$). In fact, of 37 action series in the sample, only three of them—a mere 8 percent—had one or more female creators—*American Odyssey* (2014,

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NBC), *Chase* (2010, NBC), and *Off the Map* (2010, ABC). The sample contains not a single action series broadcast on either Fox or CBS with one or more female creators credited. In light of the stunning revelations of persistent and pervasive gender discrimination and sexual harassment at the highest levels of Hollywood recently brought to the fore by the Me-Too movement, readers could be forgiven for concluding that female under-representation in this specific area is not accidental.

As noted in the introduction, all players in the TV value chain have economic incentives to increase the accuracy of predictions about the ratings of new series. To the degree that models can predict which series are most likely to fall short ratings-wise, the less need there will be for make-goods and the more optimal media planning will be. Future research will endeavor to improve predictive accuracy by including data from scripts of each episode in the study sample.

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APPENDIX: DESCRIPTION OF THE PROCESS OF CONSTRUCTING A TEXT NETWORK FROM A SCREENPLAY

The purpose of this short appendix is to provide a detailed description of the steps by which screenplays in the sample were converted into text networks. For an understanding of the theoretical underpinnings for these steps, the reader is encouraged to consult Hunter (2014) which is entitled *A Novel Method of Network Text Analysis.*

The example screenplay is that for the political drama *Designated Survivor* (2016). Written by David Guggenheim, the series debuted on ABC and was cancelled after its second season but then picked up by Netflix for a third. The series follows the life of...

> Thomas Kirkman, an American politician named as the designated survivor for the State of the Union address, who suddenly ascends from the Secretary of Housing and Urban Development to the position of President after an explosion kills everyone ranked ahead of him in the line of succession[1].

Step 1: **Convert PDF to Text File**

The screenplay for *Designated Survivor* was downloaded as a machine-readable, PDF from the *TV Writing* website maintained by Lee Thomson[2]. The text of the body of the screenplay file was extracted and copied into Notepad and then saved as a text file.

Step 2: **Identifying Acronyms**

The text file was then uploaded into AutoMap, a network text analysis application developed by Prof. Kathleen Carley, Ph.D. of the *Center for Computational Analysis of Social and Organizational Systems* (CASOS) at Carnegie Mellon University[3]. The next step was to generate a list of potential acronyms. As a practical matter this means that Automap exported to an Excel file all words from the screenplay comprised of two or more letters, all of which were capitalized.

	A	B
1	**Potential Acronyms**	**Characters**
2	EEOC	4
3	SOTU	4
4	CIA	3
5	CSI	3
6	EMS	3
7	FBI	3
8	FHA	3
9	FHS	3
10	LEO	3
11	NSA	3
12	USS	3
13	DC	2
14	GW	2
15	NO	2
16	OR	2
17	PA	2
18	PM	2
19	UN	2
20	US	2
21	COMMUNICATIONS	14
22	TRANSPORTATION	14

Step 3: **Disambiguation of Acronyms**

The list of potential acronyms exported from Automap were then compared to a proprietary database of known acronyms in possession of the author. All acronyms that already appeared in the database were maintained. The remaining ones were evaluated by a human coder for their potential inclusion into the database.

	Disambiguated Acronyms
1	**Disambiguated Acronyms**
2	EEOC (Equal Employment Opportunity Comission)
3	SOTU (State of the Union)
4	CIA (Central Intelligence Agency)
5	CSI (Crime Scene Investigation)
6	EMS (Emergency Medical Services)
7	FBI (Federal Bureau of Investigation)
8	FHA (Federal Housing Administration)
9	FHS (undetermined, possible typo)
10	LEO (Law Enforcement Officer)
11	NSA (National Security Agency)
12	USS (United States Ship)
13	DC (District of Columbia)
14	GW (George Washington)
15	NO (the word "no" caps)
16	OR (the word "or" in caps)
17	PA (Public Address)
18	PM (abbreviation for night time)
19	UN (United Nations)
20	US (United States)

1 https://en.wikipedia.org/wiki/Designated_Survivor_(TV_series)

2 http://www.zen134237.zen.co.uk/Designated_Survivor_1x01_-_Pilot.pdf

3 http://www.casos.cs.cmu.edu/projects/automap/

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Step 3: **Application of Delete List**

The next step inside Automap was to employ the "text refinement" algorithm, specifically the application of a "delete list." That list consists of over 20,000 words which were previously determined not to be of interest in this analysis. After the delete list was applied, the remaining words were exported as an Excel file.

	A	B
1	**concept**	**frequency**
2	government-issued	1
3	forward-thinking	2
4	in-over-his-head	1
5	ambassadorship	1
6	Now-President	1
7	SPEECHWRITERS	2
8	TRANSPORATION	1
9	awe-inspiring	1
10	discriminated	1
11	informercials	1
12	over-stepping	1
13	speechwriting	1
14	three-by-five	1
15	INTERCUTTING	5
16	SPEECHWRITER	12
17	face-to-face	1
18	happenstance	1
19	nevertheless	1
20	notification	1
21	overwhelming	1
22	radiological	1
23	speechwriter	4

Step 4: **Transformation Coding**

The next step was the load the remaining words and acronyms into another proprietary database comprised of words and acronyms and the etymological roots that give rise to their underlying morphemes. Hunter (2014) coined the term "multi-morphemic compound" (MMC) to describe the compound, acronyms, and abbreviations which comprise the bulk of that database. For example, in this database there is an entry for the word *countdown*. In the database this word is transformed into "**pau-2**" which is the Indo-European root from which *count* descends and "**dheue-**" which is the root from which *down* descends (Watkins, 2011). There is also an entry for the acronym *CIA* which stands for *Central Intelligence Agency*. The three words comprising that acronym descend from three different Indo-European roots: *Central* descends from **kent-**; *Intelligence* descends from **leg-1**; and *Agency* descends from **ag-1**. And since both *motorcycle* and *CIA* appear in the screenplay of *Designated Survivor*, their transformation coding was done automatically. However, about 20% of the words and acronyms of interest in the screenplay did not appear the database. These had to be inspected individually and coded accordingly.

	A	B	C	D	E	F	G	H
1	Type	TITLE	CONCEPT	ROOT1	ROOT2	ROOT3	ROOT4	ROOT5
63574	DramaPilot	DesignatedSurvivor	bone-white	BONE	kweit-			
63575	DramaPilot	DesignatedSurvivor	breakfast	bhreg-	past-			
63576	DramaPilot	DesignatedSurvivor	briefcase	mregh-u-	kad-			
63577	DramaPilot	DesignatedSurvivor	broadcasted	BROAD	CAST			
63578	DramaPilot	DesignatedSurvivor	bystanders	ambhi-	sta-			
63579	DramaPilot	DesignatedSurvivor	CHAIRMAN	sed-1	man-1			
63580	DramaPilot	DesignatedSurvivor	Chairman	sed-1	man-1			
63581	DramaPilot	DesignatedSurvivor	CIA	kent-	leg-1	ag-1		
63582	DramaPilot	DesignatedSurvivor	cobblestone	COBBLE	stai-			
63583	DramaPilot	DesignatedSurvivor	comeback	gwa-	BACK			
63584	DramaPilot	DesignatedSurvivor	countdown	pau-2	dheue-			
63585	DramaPilot	DesignatedSurvivor	cross-eyed	crux-	okw-			
63586	DramaPilot	DesignatedSurvivor	cross-talk	crux-	del-2			
63587	DramaPilot	DesignatedSurvivor	CSI (Crime Scene Investigation)	krei-	SCENE	ag-1		
63588	DramaPilot	DesignatedSurvivor	DC	streig-	COLUMBIA			
63589	DramaPilot	DesignatedSurvivor	Defcon	gwhen-	reidh-	deik-		
63590	DramaPilot	DesignatedSurvivor	doorbell	dhwer-	bhel-4			
63591	DramaPilot	DesignatedSurvivor	doorway	dhwer-	wegh-			

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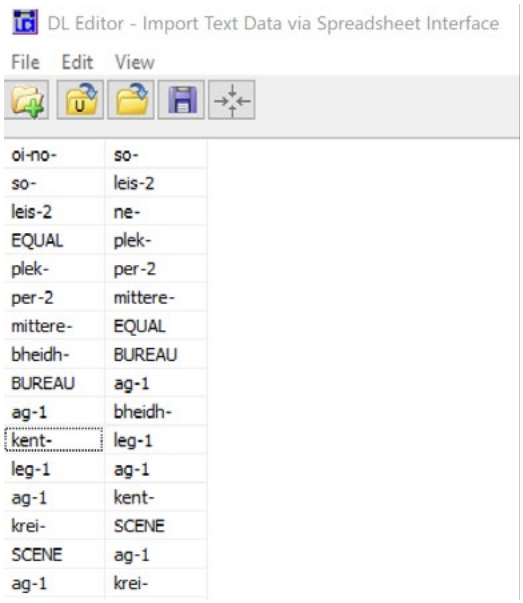
Step 5: **Conversion to Network Format**

Once all etymological roots of all relevant words and acronyms in the screenplay were identified, the next step was to put them in a format that allowed them to be represented as a text network. This step was performed by the "DL Editor" function within the social network analysis program known as UCINet. Specifically, it re-arranged the roots for each word as one or more pairs of roots, also known as an "edge list."

The resulting pairs of roots were exported to a file format that allowed them to be represented as a network graph.



oi-no-	so-
so-	leis-2
leis-2	ne-
EQUAL	plek-
plek-	per-2
per-2	mittere-
mittere-	EQUAL
bheidh-	BUREAU
BUREAU	ag-1
ag-1	bheidh-
kent-	leg-1
leg-1	ag-1
ag-1	kent-
krei-	SCENE
SCENE	ag-1
ag-1	krei-

Step 6: **Graphical Representation as a Network**

A program called NetDraw was used to first represent all pairs of concepts. This "whole" network, which is shown below, was comprised of 222 nodes broken down into 45 network components ranging in size from two (2) nodes to as many as 118 nodes. The largest cluster of nodes is clearly visible on the right-hand side of the diagram. In network parlance it is known as the "main component."

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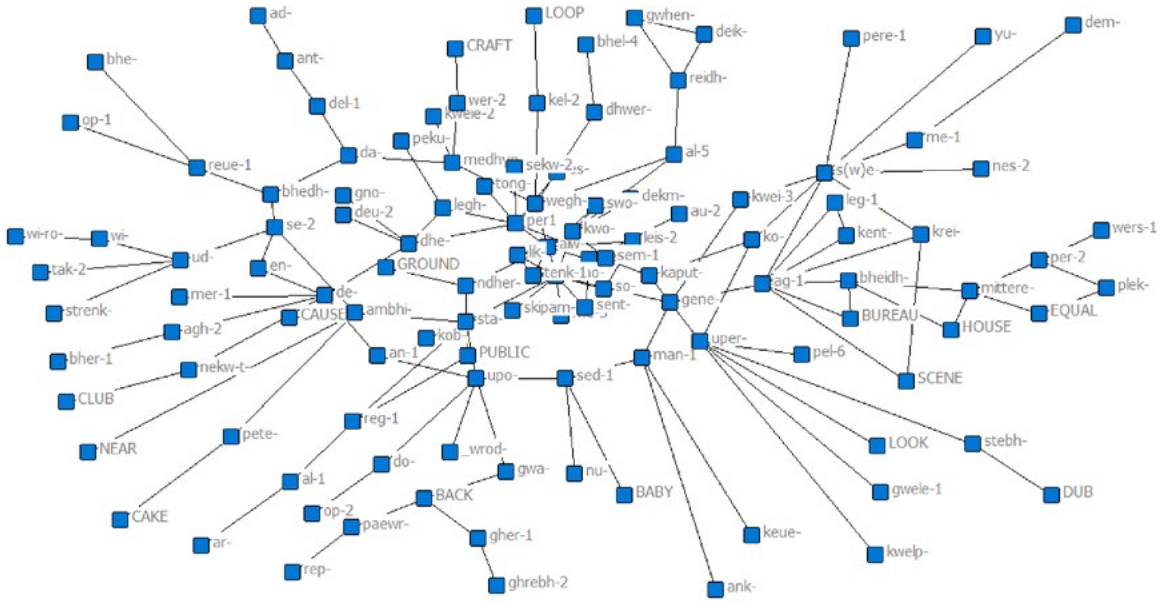
Step 7: **Measurement of the Main Component**

All measures used in the preceding statistical analysis were based on measures derived from the above network's main component which is the largest group of interconnected nodes. As noted above, the main component consisted of 118 nodes. These were interconnected by 160 ties, a number which put *Designated Survivor* in the top 10% of the sample.

Notably, the root **ag-1**, which means "to act," is clearly distinguishable in the center right of the diagram. Words and acronyms descending from that root include the *FBI* (Federal Bureau of *Investigation*), *CIA* (Central Intelligence *Agency*), *NSA* (National Security *Agency*), CSI (Crime Scene *Investigation*)—not an uncommon cluster of terms for contemporary political dramas in the USA. Also, connected to the cluster are the two other government agencies: the *Federal Housing Administration*—a government agency under the direction of Kirkman—and the *Equal Employment Opportunity Commission*—another government agency—as well as the words *Secret Service* and *Secretary of Housing and Urban Development*, the protagonist's position. Harder to discern in this graph is the center of the network where are found two important roots—**sta-** and **oi-no-** which give rise to the following relevant words and acronyms—SOTU (*State of the Union*), the President's annual address to Congress, *United States*, *United States Ship*, and *United Nations*.

One important point concerning the approach outlined above should be emphasized. Unlike all other methods of semantic network analysis of which the author is aware, the method use here places no emphasis or importance on frequency with which a given word appears in the screenplay. Rather, any word whose morphemes are derived from two or more etymological roots, i.e. a multi-morphemic compound, will appear somewhere in the semantic network, either in the main component or in one of the lesser ones.



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INSIGHTS INTO SERIAL NARRATIVES THROUGH QUALITATIVE MODELLING TECHNIQUES

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KEYWORDS
Narrative ecosystem; qualitative modeling; serial narratives.

ABSTRACT
Serial narratives can often be seen as narrative ecosystems with a long lifespan and whose transformation and evolution can be based on external factors (relating to their media, economic and reception contexts) as well as internal ones (narrative aspects, the evolution of characters and of the plot). Considering the paradigm of narrative ecosystems, this work is a preliminary investigation regarding serial narratives, conducted through the application of a qualitative modeling technique (loop analysis), developed within the ecological domain.

Loop analysis is proposed as an innovative method for the analysis of narrative ecosystems, and its aim is to reconstruct their evolutionary dynamics by implementing models able to consider the heterogeneity of all possible variables (narrative, text, productive, economic spheres etc.). This paper presents two goals: (i) highlighting, through a step-by-step methodological process, the systemic approach of loop analysis, which could help to identify successful trends by modeling them in an evaluative/predictive perspective, and (ii) preliminarily applying said method to the TV series *Game of Thrones* (HBO, 2011-2019).

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Very often, TV series become fully fledged narrative ecosystems (Innocenti and Pescatore 2012a, 2018, Pescatore et al. 2014, Pescatore 2018) that are durable, inspire public debate and productive practices in fandoms, and prolong narratives, transforming them from season to season. Within the study of contemporary serial productions emerges a need to determine and evaluate the multiple relations existing among all elements involved (text, narrative, economic spheres and aspects related to production, circulation, audience and social discourse). The interconnection among the various aspects allows serial products to change and evolve, due to both internal perturbations and restrictions (related to the narrative material) and external factors (related to the media context) (Innocenti and Pescatore 2012a, 2018, Ruffino and Brembilla 2015, Pescatore and Rocchi 2018).

Within this systemic approach, it is fundamental to adopt methods that are able to capture the system in its entire complexity and, at the same time, to consider heterogeneous variables. Nevertheless, considering the system of serial narratives, we find that some components are often difficult to quantify in terms of variables (how does one measure, for instance, a variable that takes into account the level of pathos in a narrative?) and of the links between them (how does one estimate the effect of audience on narrative aspects?).

This paper is a preliminary study aimed at applying a qualitative modeling technique (loop analysis) to investigate serial narratives. Qualitative modeling, different from quantitative modeling, favours generality and realism to precision (Levins 1966, Bodini et al. 2007).

In the first part of the paper we will tackle the method by schematically identifying the steps that are necessary to its application; subsequently, we will refer to the TV series *Game of Thrones* (HBO, 2011-2019) as case study.

METHOD: LOOP ANALYSIS

Loop analysis is a qualitative modeling method that has developed within the ecological and environmental domain thanks to Levins (1974, 1975) and Puccia (Puccia and Levins 1985), and allows to predict the evolution of equilibrium values of system variables following perturbations (inputs) that happen by changing one or more parameters in the growth rate of the variables. Inputs can be positive, negative, and be caused by external agents, or by endogenous modifications. Because of the connections that functionally link the components of the whole system, inputs may propagate beyond their direct targets to all the variables under exam. Loop analysis identifies these connections and allows to understand if the equilibrium value of system variables is expected to increase, decrease or remain the same following the perturbation. The algorithm that allows this kind of prediction uses the properties of the graph created on the basis of the knowledge of the system under analysis.

Investigation through qualitative models of loop analysis on TV series is in its preliminary phase and it is composed of various steps, organized as follows.

STEP 1. Identification of the variables of interest, named system *nodes*. Loop analysis allows us to build models composed of both homogeneous (considering, for instance, narrative-only variables) and heterogeneous variables, which makes it possible to track and integrate relevant aspects of serial narratives (e.g. aspects related to languages, production, economics and consumption).

STEP 2. Creation of qualitative *links* between variables and graph making. Qualitative models only use the sign of the interactions among variables and represent them as a graph with nodes and oriented links (Figure 1a). To indicate that linkages possess a magnitude, they are associated with coefficients (e.g. +/- a_{12}), where the sign is consistent with the type of link. Referring to the graph in Figure 1a, links represented by an arrow identify the positive effect that a variable (e.g. X_1) have on the other one (e.g. X_2), and they are associated with a positive coefficient (a_{21}); on the other hand, the links representing the inhibition of a certain variable (e.g. X_2) on the other one (e.g. X_1) are associated with a negative coefficient ($-a_{12}$). The first subscript of the coefficient identifies the variable subjected to the effect, the second subscript indicates the variable producing the effect. For instance, if we consider the ecological domain - where this method was first developed - we can see the graph of Figure 1a as a representation of a prey-predator system, where the two nodes are linked by an arrow that identifies the positive effect the prey (X_1) has on its predator (X_2), and by a link with a bullet at its extremity indicating the inhibitory effect of the predator on the prey. When dealing with natural ecosystems, building qualitative models is relatively easy thanks to the fact that interactions can be observed in the natural environment (Pescatore and Rocchi 2018: 243-4). When considering serial narratives, recognising objective links that can be identified and reported among

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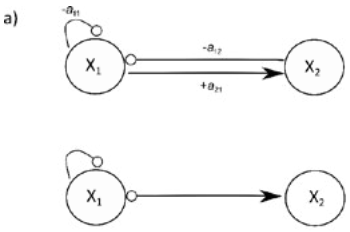

b)

"Community matrix"

	X_1	X_2
X_1	-1	1
X_2	-1	0

c)

"Table of predictions"

	X_1	X_2
X_1	0	+
X_2	-	+

FIGURE 1. LOOP ANALYSIS

(a) graphs showing the interaction between prey (X1) and predator (X2), the second graph refers to the synthetic notation used in this work; (b) community matrix; (c) table of predictions.

the model variables is not an easy task and it is currently under investigation. The reported links are hence due to an abstraction operated by the analyst on the basis of in-depth research concerning the analysed system (bibliography, interviews, data, etc.)

STEP 3. Building the community matrix. Coefficients associated with links identified during STEP2 are entered into an NxN matrix (where N is the number of variables), also called community matrix (Figure 1b). Each graph is therefore associated with a community matrix where the rows stand for the variables starting the effect, while the columns are the variables that undergoing the effect. Therefore, X_1 has a negative effect (-1) on itself because of negative autoregulation, while it has a positive effect (+1) on X_2, as established by the links. The zero (0) indicates the absence of effect of the row variable on the column variable.

STEP 4. Defining the inputs. In biological systems, an input is defined as the alteration of one or more parameters that determines the variation of a variable's growth rate. When applying loop analysis to serial narratives, we need to find a parameter that can be considered equal to the growth rate in biological systems. In this work we will explore different types of inputs (real and hypothetical).

STEP 5. Building tables of predictions. Any system variable can be the target of perturbations, and when an input (positive or negative) acts on a variable there can be consequences, both on the target variable and on the variables that directly or indirectly interact with it. It strongly depends on the structure of the interactions between the components of the system under analysis. The effect can be evaluated by identifying paths[1], circuits[2] and feedbacks[3], in terms of qualitative variations and in the levels of variables abundance (growth, reduction, no variation). For each variable, these modifications can be calculated by the prediction algorithm of loop analysis[4] and are organized in tables called tables of predictions (Figure 1c). The entries of any table of predictions denote variations expected in the level (e.g. biomass) of all column variables in response to positive parameter inputs affecting any

1 A path is a combination of edges that start from one node and arrive at another node without crossing intermediate nodes more than once (Puccia and Levins 1985). In a system there are paths of different lengths, and their identification is of fundamental importance as these are ways of propagation of impacts.

2 Circuits are closed paths that start from a node and, following the direction of interaction links, return to the same node without crossing intermediate nodes more than once (Puccia and Levins 1985).

3 Each circuit is always associated with a feedback, that phenomenon that tends to inhibit (negative feedback) or amplify (positive feedback) the consequences of initial perturbations. If we define stability as the ability of a system to maintain a lasting asset despite the occurrence of perturbative events, negative feedbacks perform a stabilizing action, while positive ones tend to make the system unstable. The nature of the feedbacks represented in the graph determines the stability or instability of the equilibrium of the system. To establish whether the system is stable or not, it is therefore necessary to calculate the sign of the feedbacks associated with the circuits that compose it. For an in-depth dissertation on the sign calculation and on stability criteria of a graph refer to Levins 1974, Puccia and Levins 1985, Bodini et al. 2007.

4 For each variable the modifications are calculated using the loop formula: $\frac{\delta x_j}{\delta c} = \frac{\sum_{i,k}\left[\frac{\delta f_i}{\delta c}\right]\times\left[p_{ji}^{(k)}\right]\times\left[F_{n-k}^{(comp)}\right]}{F_n}$ In addition to the input sign, indicated by the term [∂fi / ∂c], the loop analysis formula uses structural elements that can be identified in every graph: circuit, maximum feedback, path and complementary feedback. The latter is the maximum feedback of the complementary system, which includes all the nodes that are not part of the path that connects the variable subject to input - called the entry variable - with the variable on which we want to make a prediction of the impact - effect variable. In the above equation [∂fi / ∂c] indicates the sign of the input (positive or negative) acting on the growth function of the input variable *i*; $\left[p_{ij}^{(k)}\right]$ is the sign of the path linking the variable subject to the input (entry ariable) with variable j on which the impact prediction is to be made (effect variable), and which crosses *k* variables. The last factor in the numerator is the complementary feedback $F_{n-k}^{(comp)}$, which amplifies or reverses the effect of the path. The signs of these factors must be multiplied between them and, finally, everything must be divided by the sign of the maximum feedback of the F_n system, which measures the inertia of the entire system to changes. For an in-depth dissertation on the algorithm and examples, see the specific literature (Puccia and Levins 1985, Bodini et al. 2007: 46-56).

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row variable. Conventionally, the calculation considers positive inputs; consequences of negative inputs can be obtained by simply reversing the signs in the table. Tables of predictions are useful to provide a complete picture of the expected changes in the level of all the system variables under the effect of press perturbations on target variables. In Figure 1, we can see how a positive input acting on X_1 (for example, within the ecologic domain, an increase in the growth rate of the population of preys) is expected to increase the level of X_2 (indicating the population of predators), but doesn't modify the abundance of the entry variable; a positive input on X_2 (increase in the growth rate of the population of predators) is expected to decrease the abundance of X_1 (population of preys), but is estimated to increase the level of X_2. It is possible that the tables contain some question marks, which indicate that it is not possible to define the sign of the direction of the variable change following an input, because of multiple paths between the entry variable and the effect variable, which bear an opposite sign (effect). Ambiguity can be resolved through a numeric simulation based on assigning random numerical values to the coefficients of the community matrix[5] (linkages coefficients of the graph) and the definition of threshold values for the final prediction to be included in the prediction table[6] (Rocchi 2017: 81-2).

STEP 6. Model validation. The final step is important to check the reliability of the modeling process and can be achieved by building a database able to compare real data with expected variables changes found in prediction tables. Within the ecological domain, this step is considered to be particularly critical as history series concerning all biological populations considered in the model are not always available, and considering serial narratives, it can be challenging because of scarcity of data.

GAME OF THRONES: A CASE STUDY

The TV series *Game of Thrones* debuted in April 2011 on HBO with an episode entitled "Winter is Coming" (1.01), a motto that ended up representing the whole production, winner of a Golden Globe (Picone 2014: 27) and 47 Emmy Awards. *Game of Thrones* has since then gained international success, being distributed in more than 170 countries and having become a cult product on a global scale: the series managed to achieve more than television success, as demonstrated by the increase in tourism in Northern Ireland – where much of the filming took place – or by new trends in female baby names, emerged a year after the debut of the series in the United States, like Khaleesi and Arya (Poli 2015: 20-2). *Game of Thrones* is a *high concept tv series* (Innocenti and Pescatore 2012b: 30), a *fantasy drama* characterised by strong realistic elements (Brembilla 2018: 93, Poli 2015: 31-2).

The *Game of Thrones* phenomenon has fascinated and intrigued many researchers and enthusiasts and it also pushed them to analyse this narrative ecosystem through a variety of different methodological approaches. There are studies related to the reception of micronarratives of teasers and trailers released before the series (Pérez 2013), the relationships among characters through network analysis (Beveridge and Shan 2016), the architecture of information and the design of the narrative (Casoli 2017), celestial mechanics (Freistetter and Grützbauch 2018), the risk factors associated with mortality according to the different Houses (Angraal et al. 2018), the geopolitics and the issue of power in TV series (Picone 2014), the cultural debate about rape culture and media representation of sexual violence (Ferreday 2015), feminism (Frankel 2014), and the philosophical issues behind the series (Irwin and Jacoby 2012). This work will analyse the narrative ecosystem of *Game of Thrones* through loop analysis, taking into consideration the way relationships among narrative and economic aspects meet so as to evaluate the possible narrative developments predicted for the eighth and final season, which will be released in April 2019[7]. How will the production invest the 15 million dollars per episode envisaged for the final season and what will be the consequences from the point of view of the narration?

The first step of the modeling process consists in the identification of the variables of interest, which in this context means economic and narrative variables. The first refer to one of the most important practical issues regarding the

5 This procedure is performed N x 1000 times, where N is the number of variables of the model. The generated community matrixes are accepted and inverted if and only if they meet certain stability criteria. For an in-depth dissertation on the simulation process refer to Rocchi 2017: 81-2.

6 For each simulated and accepted matrix a prediction table is produced, where responses of the variables are given without ambiguity. Subsequently, a global prediction table is produced by combining the prediction tables obtained from the simulation based on the percentage of signs. For each prediction, if all the matrixes (100% of the cases) bear the same sign (+ or -), the direction of the change (that is the prediction) is easily assigned (+). However, there are cases in which for the same prediction some matrixes provide a sign (+) and another part returns an opposite sign (-). The final decision on the prediction, to be included in the global prediction table, is made on the basis of the percentages following the threshold values (Rocchi 2017: 81-2).

7 At the time of writing of this paper the eighth season is not yet released.

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cinema or TV transposition of *Game of Thrones:* budget. The initial investment for the project was of about 6 million dollars per episode, with an estimated cost of between 5 and 10 million dollars for the pilot. The first season (ten episodes of about 60 minutes) cost approximately between 50 and 60 million dollars (Picone 2014: 29). After the series gained international success, the budget kept on rising and reached 10 million dollars per episode for the seventh season. It is believed that production costs for the eighth and last season reached 15 million dollars per episode (Ryan and Littleton 2017), with six 80 minutes-long episodes. Within the complex contemporary serial narratives, the diegetic component is influenced by external variables like production costs (for example settings and special graphic effects), actors and fandom. As for the economic aspects, we decided to consider only one variable, that is the economic resources invested in special effects (E), which proved to be a strong pillar of the series thanks to CGI (Computer-Generated Imagery), essential to create the dragons.

As far as narrative variables are concerned, the series has tried to follow George R.R. Martin's *A song of ice and fire* until the fifth season, then from the sixth season it has opened to a broaden range of narrative possibilities. By following the indications Martin himself provided during various interviews, it is possible to outline three main plots: the war plot (WP), the fantasy plot (FP) and the soap plot (SP). The war plot (WP) refers to events related to battles, duels and wars, regardless of the characters involved, being them humans or fantastic creatures[8]. An example of a duel can be found in the episode "The wolf and the lion" (1.05), where Ser Loras Tyrell fights against Gregor "The Mountain" Clegane during the Tourney of the Hand. During the series, many other duels take place, like the one that sees again "The Mountain" battling Oberyn Martell in "The Mountain and the Viper" (4.08). War is about to start, and the episode "Blackwater" (2.09) gives the audience a clear idea of how spectacular battles in *Game of Thrones* can be, when Stannis Baratheon's fleet tries to conquer the city of King's Landing during the Battle of Blackwater. As for the fantasy plot (FP), it refers to events involving fantastic creatures (dragons, dire wolves, giants, Children of the Forest, etc.) and "magical" elements in general. In the first episode "Winter is coming" (1.01) the audience is already introduced to a fantasy world by hinting to the Others, but it is with the birth of the dragons in the final episode of the first season "Fire and blood" (1.10) that the fantastic element blossoms. Magic arrives in Westeros with Melisandre giving birth to a Shadow in "Garden of bones" (2.04), while Bran Stark starts having visions of a raven with three eyes in "Cripples, Bastards, and Broken Things" (1.04). Other fantastic creatures will soon arrive, like giants accompanied by mammoths in "The watchers on the wall" (4.09). The seventh season closes with an enormous army of Others approaching the Barrier, followed by Viserion, the undead dragon, in "The dragon and the wolf" (7.07). Lastly, the soap plot (SP) can be identified in all major situations where we find romantic relationships, tactics, intrigues and fights for power that do not present elements of magic of fantasy, but rather play on social hierarchies and chivalrous values[9]. It is clear from the beginning that the issue of power is a central one in *Game of Thrones*, and in "Winter is coming" (1.01) the scene showing lord Eddard Stark accepting the title of Hand of the King proves it: other events follow, for example the moment when Eddard himself has to write down King Robert's will and eventually modifies it, following the discovery of the incestuous relationships occurring within the Lannister household in "You win or you die" (1.07). Another crucial moment for the series is the death of King Joffrey in "The lion and the rose" (4.02). The story of Westeros is also full of intrigues to get to the control of the Seven Kingdoms. Counsellors themselves are not immune from the "game of thrones", and Varys himself will sail towards Essos with Tyrion Lannister in "The Children" (4.10), finding there both the counsellors of Daenerys, "mother of dragons". The war plot (WP), the fantasy plot (FP) and the soap plot (SP) do not exhaust the narrative potential of the series, instead they represent three intertwining plots that revolve around the running plot of the battle among Households for the supremacy and the conquest of the Iron Throne.

After having identified the variables (WP, FP, SP, E), we proceed with building the model and explicating the relations through the graph (Figure 2a) and the community matrix (Figure 2b, 2d).

As already seen for the identification of the variables, also the choice of links took the words of George R.R. Martin into consideration, by considering the genre of the series and its characteristics. The author defined his *A song of ice and fire* as an epic fantasy that includes the historic novel inspired by

8 If we consider fantasy creatures as part of the war plot, we have to picture an overlap between the two plots (WP and FP), as it happens for example with the war with White Walkers.

9 We did not contemplate to split power intrigues and romantic relationships into two plots, as the latter result as part of the first ones: there is not an autonomous "romance" dimension not related to power. When we talk about "soap plot" we mean to synthetize the substantial merging of the two.

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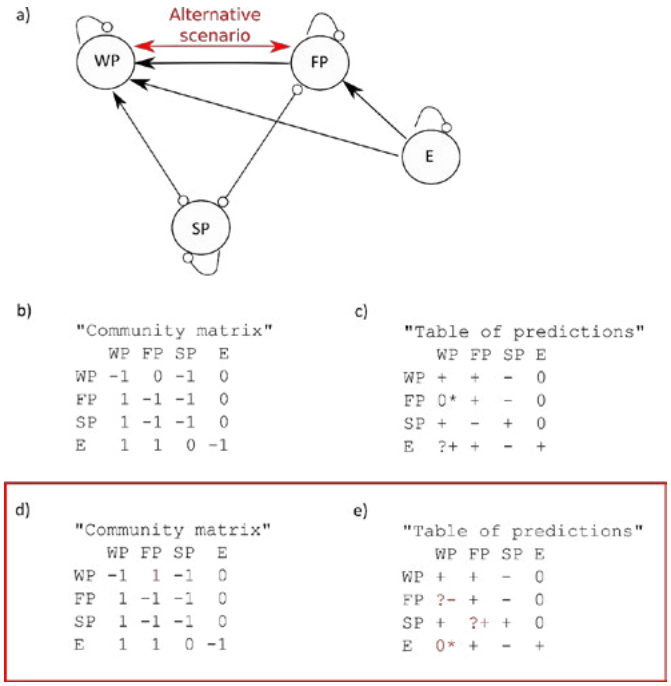

FIGURE 2

a) *Game of Thrones* graph with four identified nodes – special effects (E), war plot (WP), fantasy plot (FP) and soap plot (SP) – connected by oriented linkages. In red are underlined the differences between scenario1 and scenario2: b) and c) show the community matrix and the table of predictions for scenario1, while d) and e) show community matrix and table of predictions for scenario2 (the differences with the first one are depicted in red).

Medieval times (with the aim of making the plot more realistic) and the typical elements of fantasy:

> It's definitely a fantasy novel. It has dragons and so forth in it. It does have the feel of historical fiction. I love history. [...] Most epic fantasy or high fantasy has a quasi-medieval setting. Ever since Tolkien and The Lord of the Rings. So, in that sense, it's squarely in the tradition of many of the writers that have gone before. What I try to do is give it a little more of the feel of historical fiction than some of those other books had before it which have, I suppose, a more fantasy or fantastic feel. My take on the genre has somewhat less magic and sorcery onstage and more emphasis on swordplay and battles and political intrigue and the characters. [...][10].

10 January Magazine, http://januarymagazine.com/profiles/grrmartin.html

It seems plausible to consider a relationship of mutual inhibition between the fantasy plot (FP) and the soap plot (SP), as these variables compete for narrative space. As for the soap plot (SP), one could consider the political and sentimental contrapositions as resources, that is as narrative material able to feed the war plot (WP). The soap plot (SP) and the war plot (WP) find themselves in a predation relationship, where SP has a positive effect on WP, while WP has a negative effect of SP because it diminishes SP's narrative space. As far as the relationships between WP and FP are concerned, it seems reasonable to hypothesize two possible scenarios (Figure 2a). Scenario1 (defined by the black links in Figure 2a) sees a positive effect of FP on WP, and not vice versa, which underlines the fact that part of the fantasy plot creates the basis on which to install the war plot it overlaps with (considering, for example, the battles involving fantastic creatures). Considering *Game of Thrones* as an epic fantasy, scenario2 (the same as scenario1 except for red elements in Figure 2a, 2d, 2e) contemplates – besides the positive effect of FP on WP – also a positive effect of WP on FP, so as to underline a cooperation relationship where both elements get benefits (in terms of narrative space). The necessary assumption to understand this orientation of linkages is that of thinking of *Game of Thrones* as the mixture of more genres, where the epic fantasy builds up around the war plot (WP) and the fantasy plot (FP).

In an interview (Cogman 2012: 5), Martin explains the difficulties of TV transpositions because of the elevated costs. *Game of Thrones* has seen an increase in budgets after the first season, where the fantasy element is not as present (Marino and Gotti 2016: 350-1) when we compare it to the subsequent seasons, where the fantasy plot is enhanced. Special effects (E) have a positive effect both on the fantasy plot (FP), which benefits most from graphics – dragons, says David Benioff, "were the most important special effect in the whole of the first season" (Cogman 2012: 177) even though they only make an appearance in the final episode – and on the war plot (WP). As pointed out by director Neil Marshall when talking about the creation of the Battle of Blackwater, which cost 8 million dollars (Poli 2015: 145), "you have to fight against the clock and use all the funds as best as possible to tell the story using all the possible cinematographic tricks" (Cogman 2012: 113). In graph shown in Figure 2a, each variable negatively auto-regulates because it is characterised by time limits dictated by the format (narrative variables) and by economic limits (no more resources for special effects).

Considering the tables of predictions (Figure 2c, 2e) the objective is understanding if and how an increase in budget,

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or an increase in the economic resources dedicated to special effects (positive input on variable E) could expand within the narrative ecosystem under study, and in particular as for the narrative material. Following a positive input on E, both in scenario1 and scenario2 we expect an increase (+) in the fantasy plot (FP) and a decrease (-) in the soap plot (SP), while the war plot (WP) tends to increase (?+[11]) for scenario1 and not to change (0*) in scenario2. If we assume positive inputs on the three plots both in scenario1 and in scenario2, special effects (E) are obviously not affected. When analyzing the table of predictions along the columns (where it possible to understand which inputs affect the nodes of the model in terms of changes), it is interesting to note how the variable of the soap plot (SP) is expected to decrease following positive inputs acting on all variables (WP, FP, E) both in scenario1 and scenario2. Considering impacts on the fantasy plot (FP), it is possible to see how the predictions always consider an increase when taking into account positive inputs on WP and E both in scenario1 and scenario2, while there are different predictions between the two scenarios if we consider a positive input on SP (FP is expected to decrease in scenario 1 and generally to increase in scenario 2). The variable of the war plot (WP) is the one that presents the greatest differences between the two scenarios: WP is expected to increase for positive inputs on SP in both scenarios, while considering positive inputs on FP it is expected not to change in scenario1 and generally to decrease in the scenario2. Differences pointed out in the table of predictions are interesting, and the relationships established between the war plot (WP) and the fantasy plot (FP) will have to be analysed in depth and verified through further investigations.

On the basis of the developed model and considering the predicted increase in economic resources destined to special effects, an increase in the narrative biomass regarding the fantasy plot and a reduction in the soap plot is expected for last season of *Game of Thrones*, while the war plot presents non-homogeneous predictions that will be subject to further investigations. All we have to do is wait for the release of the eighth season in order for us to evaluate the predictive results of the loop analysis model and assess which scenario best describes the narrative ecosystem of *Game of Thrones*.

11 The positive input on E yields a plus sign with a question mark for WP. This result comes from the simulations, see note 5 and 6.

CONCLUSIONS

Loop analysis was successfully applied to different ecological systems (Ortiz and Wolff 2002, Bodini et al. 2007, Martone et al. 2017, Bodini et al. 2017, Rocchi 2017) and recently proposed also for the study of serial products within the paradigm of narrative ecosystems (Pescatore and Rocchi 2018). Through the preliminary investigation of the narrative ecosystem of *Game of Thrones*, we have experienced a first application of the loop analysis methodology, taking into account heterogeneous variables. Through a broader investigation of the presented case study and of other cases, this methodology would allow to investigate the complex relationships existing between heterogeneous variables (narrative, productive, consumption, etc.) and to evaluate the propagation of direct and indirect effects following both internal and external perturbations and constraints, that act on one or more variables of the system. Therefore, an innovative methodology for media studies was proposed, which, based on the knowledge deriving from traditional studies, is able to systematically grasp potentially interesting aspects and that can be further investigated (for example, in the case study regarding *Game of Thrones*, there emerged the need to analyze more in depth the relationships established between war plot and fantasy plot). In this perspective, we hope that thanks to further studies, through the use of modeling tools, it will be possible to describe a serial product in its complexity, by investigating, delineating and hypothesizing, both at the level of the single product and of the trends related to the media context, the functioning and response in relation (I) to narrative changes, (II) to reception and consumption practices and (III) to the production and distribution strategies of the media industry. This approach could allow the identification of emerging trends and patterns, both within the individual cases analysed and in the context of the contemporary media industry.

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'I'VE BEEN NOWHERE AND DONE NOTHING'. THE CHARACTERIZATION OF DAISY MASON IN THE BRITISH DRAMA DOWNTON ABBEY

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KEYWORDS
Characterization; television series; *Downton Abbey*; corpus linguistics; identity; language.

ABSTRACT
The article investigates the characterization of Daisy Mason in the British television drama *Downton Abbey* (2010 – 2015) and is based on episode transcripts from Series One, Two and Three. The relevant background of the study is represented by Culpeper's and Bednarek's studies on characterization in drama and fictional television. Drawing upon a combined methodology, in line with the Corpus Assisted Discourse Studies tradition, the analysis puts in relation the most relevant aspects of the personality of Daisy – the character traits obtained by applying Culpeper's framework on textual cues – with typical features of her speech revealed by corpus linguistics methodologies. Corpus evidence shows a relevant presence of negatives in Daisy's speech: *I don't know* is the most frequent three-word cluster around the pronoun *I*. Her sentences are shorter than the average of other characters and are often self-interrupted. Moreover, she asks a question every fourth sentence, while the average of other characters is one every fifth. Results point to a frustrated character, a silent rebellious who has difficulties in expressing her thoughts and does not accept to play a minor role in the story.

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1. **INTRODUCTION**

The present study deals with the language used in the shooting scripts of a popular British television drama, *Downton Abbey* (2010 – 2015). More specifically, it explores how language is used in the series to build or reinforce the identity of characters. Conceived as a work in progress, in its initial phase the analysis takes into account the characterization of a female character: Daisy Mason, the kitchen maid.

Created by Oscar-winning writer Julian Fellowes, *Downton Abbey* is set in a grand manor house during the first decades of the 20th century and follows the lives of the Crawley family and of their servants downstairs. In the background of private events involving the Downton's inhabitants are some major events in history: among them, for instance, the sinking of the Titanic, the First World War, the Spanish flu pandemic, and the formation of the Irish Free State. The first season of the series aired in the United Kingdom in 2010. At the time we are writing, six seasons have been made and a film adaptation has been announced (Clarke 2017)[1].

The popularity of *Downton Abbey* has been put in relation with the evocation of feelings of nostalgia for a constructed, idealized and mythic world, "a form of Englishness epitomized by the country estate" (Baena and Byker 2015:259), not differently from its predecessor *Upstairs, Downstairs* (1971-1975), which aired in the 1970s and also gratified an intense English nostalgia. A sumptuous, big-budget production, *Downton Abbey* indeed owes its success to the accurate representation of life on an English estate in the Victorian era, to ravishing sets and costumes, but also to indelible characters, such as Lady Mary, Anna, Matthew, Daisy, Carson, O'Brien, Lady Edith and Lady Violet.

Language plays a very important role in shaping Downton's characters and has been used to depict them, no less than with costumes and sceneries, in a very powerful way. This would also explain why characters are so strictly associated with some of their most captivating quotes, which stick in the memory of audiences. For instance, any true admirer of the series would recognize that "I'm a woman, Mary. I can be as contrary as I choose" is part of Lady Violet's speech, while "It's better to know the truth than to live in a cloud of mystery and despair" belongs to Lord Grantham.

FIG. 1.1 - ENACTING ENGAGEMENT OF FANS ONLINE: AN EXAMPLE ON TWITTER

FIG. 1.2 - ENACTING ENGAGEMENT OF FANS ONLINE: AN EXAMPLE ON FACEBOOK

1 Clarke, Steven (2017). *"Downton Abbey* Movie Aims for Production in 2018". http://variety.com/2017/film/global/downton-abbey-movie-for-2018-1202475729/ (last accessed: 20-10-17)

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As it is often the case for successful television series, the Downton phenomenon is associated with a massive presence of resources available on the web for the enjoyment of fans worldwide: official and non-official sites, dedicated social media accounts, blogs, wiki-pages, episode guides, news, trailers, and many more (Tralli 2012). A common trait of these digital resources is the great emphasis placed on the lines spoken by characters. Not only are quotes from the series often reported below the images of related characters or frames from the show[2], but also the script in its entirety is cherished by fans as a piece of literature, to the point that a group of Downton lovers have manually transcribed each episode, on the basis of their personal listening. The so-obtained lines are made available for anyone on a blog[3].

The drama's popularity has spread in part due to social media buzz. Campaigns running on Downton's official social media deeply exploit the tendency of fans to memorize quotes from the show, even the ordinary and less salient ones. A typical strategy pursued by social media managers is to engage users through quizzes, putting the knowledge of fans to the test, as in figures 1.1 and 1.2.

The authors of *Downton Abbey* seem to be well aware of the paramount role played by the words spoken by characters in the series, as the official complete scripts have already been collected in a series of publications and merchandized as well. The first three volumes published (Fellowes 2012, 2013, and 2014) were also the primary source for the analysis carried out in this paper (see section 3).

The popularity gained by the spoken lines of *Downton Abbey* encourages to explore the reasons for this phenomenon from a linguistic perspective: what makes lines so special in the ear and memory of audiences? To what extent are characters constructed on the basis of what they say? And, lastly, is it possible to identify a prototypical quality in characters, based on their words and independent from the actor performances? In order to bring about some relevant insights into the questions outlined above, the shooting script has been analysed focusing on one, less exposed character of the series, Daisy Mason, thus adopting a very narrowed perspective, which is expected to produce very specific outputs.

It has to be made clear from the outset that the observation of performances is excluded from the present analysis. Such methodological approach has been followed being aware that restricting the observation to dialogue could be limiting the analysis and its conclusions (Bednarek 2010: 18-9). As a matter of fact, television dialogue contrasts to prose fiction, where characters are described by means of words only, because of its inherent multimodality: television dialogue is the outcome of multimodal performance given by actors in a specific setting. For instance, it has been argued that "the dramatic discourse of television drama is heavily dependent upon the close-up shot of the face and the thoughts, emotions and reactions conveyed by that face" (Durham 2002: 87). Moreover, according to Bednarek (2010), scriptwriting for television does not reflect a unique author or writer expressing themselves 'artistically' as in the case of prose fiction, but rather a commercial multi-authorship, comprised of different writers having different roles. It is however likely that a script by Julian Fellows, who, beside a screenwriter, is also a novelist[4], might belong to those cases where the writer's voice come through to a certain extent (Selby and Cowdery 1995). We are therefore convinced that keeping a focus exclusively on language and intentionally avoiding multimodal performance features might reveal the inner specificity of characters as in the original idea of writers, beyond the interpretation given by actors: given their fixedness, words in the script could bring to the surface the prototypical quality of characters, which is independent from the adaptation that different actors might display at different times and in different ways, and that is what we are most interested in discovering.

2. THEORETICAL BACKGROUND

The theoretical background of the study draws principally on Culpeper's (2001) model of characterization in fictional texts. According to this model, characters are constructed in the mind of viewers through explicit and implicit "textual cues that give rise to information about character" (Culpeper 2001: 163). On the one hand, explicit cues include those parts of speech where self-presentation and other-presentation are conveyed: for instance, in the case of Daisy, what she says about herself (DAISY: I know I'm a dogsbody), but also information given by other characters when they are speaking about her (ANNA: Daisy, don't be so daft!). On the

2 See, for instance, http://www.tvfanatic.com/quotes/shows/downton-abbey/;www.imdb.com/title/tt1608844/quotes and the Twitter account https://twitter.com/dabbeyquotes.

3 http://scriptline.livejournal.com/

4 Among Julian Fellowes' books are *Snobs* (2004), *Past Imperfect* (2012) and *Belgravia* (2017).

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other hand, implicit cues "have to be derived by inference" (Culpeper 2001: 172), for example, by taking into account the structure of dialogues, lexical, syntactic and other paralinguistic features.

In the light of the focus on televisual characterization, Bednarek's work (2010, 2011a, 2011b, 2011c, 2012a, 2012b) is an essential premise for the underlying study. In particular, Bednarek has put forward the notion of expressive character identity (2011c), i.e. "those character traits that concern emotions, attitudes, values and ideologies, which [...] have a strong element of subjectivity [...]" (2011c: 9-10). Expressive character identity, she claims, is only one of the many different aspects to consider when investigating characterization. Pointing back at Culpeper (2001), she mentions other components, such as social role and group membership categories (2011c: 10). Of particular interest is that characters are often, at various levels, described and understood in terms of their expressive features - e.g. 'exuberant', 'smiling tense person' (2011c: 10); in addition, characters are often representative of a particular ideology (or attitude, or set of values) and are thus contrasted in narrative on the basis of what they stand for (2011c: 10).

Let us consider two main characters in *Downton Abbey*, for example: Lady Violet Crawley and Mrs. Isobel Crawley. Even though they share the surname, having married into different branches of the same family, they have a very different social status and are both extremely proud of it. While the Dowager Countess enjoys her privileged position as an aristocratic and stands for all that is traditional and conservative, Mrs. Crawley despises the worthless life of the aristocracy and campaigns for equality and social fairness. Their conversations and interactions are frequently comical as a result of the two opposite ideological extremes they stand for. This example is also useful to illustrate the last point made by Bednarek in clarifying the importance of investigating expressive character identity, i.e. that "expressive aspects are important in character impression formation" (2011c: 10). In describing the Dowager Countess, we said that she "enjoys her privileged position as an aristocratic". This is not part of any script of official description, but it is rather the result of a long-term impression that the character made on us, as members of the audience. This impression is the result of our perception, but also and more importantly of the words she uses and attitudes she displays.

It is thus interesting, for a linguist, to explore how expressive character identity is constructed in televisual narratives by means of corpus linguistics tools, as they allow for the isolation of the idiomatic specificity of each character. Mostly classics have been explored from this perspective (see for instance Fischer-Starke 2006, 2009; Mahlberg 2007a, 2007b; Stubbs 2005), but there are also some studies on popular fiction, such as Mahlberg and McIntyre 2011. In Mahlberg and McIntyre's words "a corpus analysis can provide insights into characterization, the creation of particular stylistics effects and the construction of the fictional world of the text" (2011: 205). Applying a corpus stylistics approach to the study of a TV script implies that we can focus on phraseology as an aspect of characterization (Fischer-Starke 2006, 2009) and consider language as a primary component for the creation of the show's atmosphere (Fischer-Starke 2006).

3. MATERIALS AND METHODS

The study is based on the following corpora:

a. DA CORPUS: transcripts for all the episodes in seasons One, Two and Three of *Downton Abbey*. The dialogues were taken from the original scripts published by the authors of the series (Fellowes 2012; 2013; 2014).
b. DAISY CORPUS: a corpus of Daisy's lines only, also derived from the wider corpus by means of simple tags (</DAISY>), identifying all her lines across the seasons.
c. OTHERS-D CORPUS: a corpus of dialogue by all other speakers, excluding Daisy, also extracted by the wider corpus. This sub-corpus was created to be contrasted with the DAISYCORPUS.
d. MARY CORPUS: a corpus of Lady Mary's lines only, also derived from the wider corpus by means of simple tags (</MARY>), identifying all her lines across the seasons, as further term of comparison for DAISY CORPUS.

TABLE 3.1. THE DA CORPUS AND ITS SUBCORPORA – MAIN FEATURES

Corpus	Types	Tokens	Sentences	Mean Sentence Lenght
DA CORPUS	8,122	212,751	26,191	8.12
DAISY CORPUS	806	4,087	656	6.23
OTHERS-D CORPUS	8,075	208,664	25,536	8.17
MARY CORPUS	2,052	14,965	2,318	6.46

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The main features of the corpora are outlined in table 3.1. Collected texts include dialogues and characters' names introducing each spoken line; scenes descriptions and comments by the author present in the original scripts were excluded.

The analysis followed a combined methodology, based on both qualitative discourse analysis and quantitative corpus methodologies, in line with the Corpus Assisted Discourse Studies tradition (Partington, Duguid and Taylor 2013). To analyse the scripts, a corpus stylistics perspective was adopted (see Semino and Short 2004). Such perspective concerns the study of mainly – but not exclusively – literary texts and brings together two empirical approaches to linguistic description, i.e. stylistics and corpus linguistics (Wynne 2005: 1). By entailing a combination of qualitative and quantitative analytical techniques, corpus stylistics offers solutions to issues such as: (a) the selection of the examples to analyze (see Leech and Short 2007:2), and (b) supporting claims by means of quantitative evidence. It therefore allows linguists to focus on details while keeping an eye on the full text.

As a first step in the analysis, Culpeper's framework on textual cues (2001) has been applied. That means applying concordance analysis to the corpora, in order to explore how Daisy defines herself in her direct speech and how she is defined by other characters when they are speaking about her.

Secondly, a closer look has been taken at the linguistic specificity of Daisy's speech, in order to find out how her personality reflects into her language use. Using the linguistic analysis software Wordsmith Tools 6.0 (Scott 2012), a wordlist was created for Daisy's speech and concordances of the most relevant items were derived. Keyword lists were also derived in order to compare the most frequent words used by Daisy against those used by other characters (Gabrielatos 2018).

4. **CHARACTERIZATION OF DAISY**

Following Bednarek (2012a: 208), concordances for *I, I'm* and *me* in the DAISY corpus were extracted in order to highlight explicit cues (Culpeper 2001) about Daisy in her own dialogue. Those most likely to explain Daisy's personality were grouped into several, recurrent character traits, as shown by the following table (Table 4.1).

It is also interesting to look at the way the personality of Daisy comes across through the words of other characters, as their comments are still explicit textual cues, potentially revealing something more about her. The OTHERS-D corpus

TABLE 4.1. EXPLICIT CUES (CULPEPER 2001) ABOUT DAISY: SELF-PRESENTATION

Character Trait	Example dialogue
Daisy is frustrated in her job, although she loves it and is aware of being good at that. She feels exploited and underestimated by her boss, Mrs. Patmore.	I'm fed up... They promised me promotion. She said they'd get a new kitchen maid and I'd be Mrs. Patmore assistant. And I work well, but you wouldn't know it the way I'm treated. It may be wrong to complain with Mr Bates like he is, but it reminds me that life's short and I'm wasting mine. I just feel taken for granted. Sometime I think you don't notice that I'm human at all. No, I don't want to leave unless I have to, but I want to move on. I think I'm more than a kitchen maid now. I want to be a proper assistant cook, I know I can be. I'm running at full strength and always have been with no one to help me, neither.
She has low self-esteem and feels somehow inadequate, as if she did not deserve good things in life	I've never been special to anyone. I were only ever special to William. And why would he be when he's seen and done so much and I've been nowhere and done nothing? Maybe I should be more outspoken and say what I really think — I thought he might like me but I was wrong. I never had that in my childhood. Someone you could always trust. Me? Run this farm? Are you serious? But... I'm a cook. But I'm a woman. Nothing. I mean, I know I'm a dogsbody, but— But I don't deserve it. Not when I were only married to William for a few hours. I don't believe it! I've never won nothing before! 'Course not. He's too good for me, I know that.
She has high moral standards	I can't. It would be dishonest. Almost like cheating. Jane keeps making out I'm a war widow. But I'm not, am I? You all know that. I married William on his deathbed. That don't count. And I wasn't good to him. He thought I loved him, but I didn't. Not like he loved me. I can't lie to him at the end. Don't make me be false to a dying man.
She tries to please others, even against her own needs and has great empathy for others, despite social distance	I'd do anything for you. I led him on. When he was wounded, I let him think that I loved him. I thought it'd cheer him up, give him something to live for. This will be hard for you, but what would you say if I'd met a man I liked? Because the last thing I'd ever do would be to hurt you. Argh, I wish you'd cheer up. Please. I'd do anything to cheer you up. I know it was a while ago, but we knew him. I think of how we laid the fires for Mr Patrick, but he drowned in them icy waters. (Mr. Patrick Grantham) She was ever so nice. I still get sad when I think about her. (Mrs. Lavinia Swires) I only talked to her once, but I thought she was nice. (Mrs. Lavinia Swires) I never thought I'd feel sorry for an earl's daughter. (Lady Sybil) I swear I'd have to run and hide, in a place where no one knew me. (Lady Edith)

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was explored in this regard and the relevant excerpts were transcribed in the following table (Table 4.2).

TABLE 4.2. EXPLICIT CUES (CULPEPER 2001) ABOUT DAISY: OTHER-PRESENTATION

Character Trait	Example dialogue
Although her name and role are barely known upstairs – as a kitchen maid she is the lowest of the low–, Daisy's reliability is recognized by her bosses and masters.	MARY: Daisy posted. The kitchen maid. MISS O'BRIEN: Well, it's Daisy, my lady...the kitchen maid. MR CARSON: And Daisy, we all know the value of your contribution. MARY: I am grateful to you, Daisy. You cannot know how much.
She is not good at expressing her thoughts and feelings verbally. She lacks of experience and can be easily misunderstood.	MASON: This is too modern for me, Daisy. I'd only say this: you have a pure heart, and if he's a proper man, he'll know that. But take your time, prepare what you'll say, make sure your words cannot be misconstrued. MRS PATMORE: Daisy, there's nothing wrong with one-sided loving. You should know that if anyone does... It's not Alfred's fault. It's not your fault. It's not Ivy's fault. ALFRED: Glad to see you speak up for your rights.
She does not get the attention she would from others	ALFRED: Sorry, Daisy. What were you saying? MRS. PATMORE: All in good time, Daisy. All in good time.
She can be sometime unexpectedly aggressive	IVY: [...] But here I'm bossed by Mrs Patmore and bullied by Daisy, and everyone seems to mistake me for a rag to wipe their shoes. DAISY: Him a fancy man? MR BATES: Don't be so nasty, Daisy, it doesn't suit you. MRS. PATMORE: What's happened to you? Have you swapped places with your evil twin?

So far, Daisy's personality has been described on the basis of what she says or what other characters say about her in dialogues. To widen the perspective of the analysis, it is worth looking more closely at Daisy's speech to identify the lexical and syntactic features typical of her character. Such an approach might confirm or reject the portrait of the character depicted so far on the basis of textual cues. More interestingly, language use may highlight hidden aspects in Daisy's personality, which cannot be brought about by a qualitative examination of her lines.

As a very first step, the wordlist of the DAISY corpus was examined and Daisy's language was evaluated in terms of frequency of items. Bearing in mind that a rough wordlist allows only surface-level observations and, consequently, only educated guesses on typicality, the following aspects were noted:

- the pronoun *I* is the most frequent item in the DAISY corpus.
- the presence of negatives is relevant: eight instances within the first top 100 words spoken by Daisy [*don't (49), not (47), no (29), never (13), nothing (13), can't (12), won't (11), didn't (10)]*. Taking into account the entire frequency list and including all the negatives, they represent 5 per cent of her total words. We find only three negatives within the top 100 words spoken by OTHERS-D.
- only two proper names appear within the first top 100 words, *William* and *Patmore*; it looks like Daisy has a limited number of connections and is in relation with only a few characters.

Using Wordsmith (Scott 2012), it is possible to compare the frequencies in one wordlist against another in order to determine which words occur statistically more often in a first wordlist when compared with a second wordlist and vice versa. Using DAISY as node corpus and OTHERS-D as reference corpus, a list of keywords was obtained, i.e. a list of words that Daisy uses more frequently than other characters. Daisy's keyword list gives us only a small number of words (see table 4.3), partially confirming the results already provided by the analysis of most frequent items. The presence of the proper name *William* does not come as a surprise: he is the male character Daisy is most involved with in the first three seasons and they even will be married, although for a very brief time, as he dies soon after the wedding. Most occurrences of the personal pronoun *he*, which is another keyword of Daisy's speech, also refer to William. The personal pronoun *I* also appears as prominent, while the adjective *slow* is not salient, because used by Daisy when teaching the foxtrot to a colleague, Alfred. Its keyness is therefore due to the repetition of the words '*quick, slow'* step after step.

TABLE 4.3 KEYWORDS OF THE DAISY CORPUS

Key word	Frequency	%	Texts	Keyness	P
SLOW	10	0,24	2	64,90	0,0000000000
WILLIAM	28	0,67	12	49,86	0,0000000000
I	224	5,34	23	40,43	0,0000000000
HE	64	1,52	16	36,02	0,0000000001

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Such surface-level observations based on frequency and keyness of items can acquire more depth when compared to another character in the series, Lady Mary, who is in many ways – for her social status and leading role in the drama - opposite to Daisy. The pronoun *you* is the most frequent word in Lady Mary's wordlist and it is possible to identify four different characters within her fist top 100 words (*Papa, Matthew, Mama, Granny*). Negations are five within the first top 100 words (*not, don't, no, can't, won't*). The strongest keyword of Lady Mary's speech is *Papa*, followed by *Granny*, *Mama* and the personal pronoun *you*. These findings apparently suggest that Daisy is self-centred and introvert, while Lady Mary is more prone to interaction with other characters.

TABLE 4.3. TOP THIRTY LEXICAL WORDS IN THE DAISY CORPUS

N	Word	Freq.	%
1	THINK	34	0,83
2	KNOW	33	0,81
3	GO	29	0,71
4	WILLIAM	28	0,69
5	MRS	26	0,64
6	MR	20	0,49
7	WELL	20	0,49
8	PATMORE	18	0,44
9	RIGHT	18	0,44
10	MAKE	15	0,37
11	SAID	13	0,32
12	SAY	12	0,29
13	MEAN	11	0,27
14	THOUGHT	11	0,27
15	BACK	10	0,24
16	SLOW	10	0,24
17	THANK	10	0,24
18	MILADY	9	0,22
19	THOMAS	9	0,22
20	ALFRED	8	0,20
21	CARSON	8	0,20
22	FEEL	8	0,20
23	KITCHEN	8	0,20
24	MAID	8	0,20
25	NICE	8	0,20
26	SEE	8	0,20
27	SORRY	8	0,20
28	WRONG	8	0,20
29	SUPPOSE	7	0,17
30	TELL	7	0,17

Putting aside grammatical words, the thirty most frequent lexical words in the DAISY corpus are those reported in table 4.3. Such a list allows a deeper insight into the 'aboutness' of Daisy's speech and, consequently, a more refined description of her language. A first curious aspect is that Daisy's workplace, the *kitchen*, which plays such an important role in her life, as well as the noun identifying her role in the house, *maid*, come only in the last part of the rank (respectively, as 23rd and 24th items in the list).

Almost half of the top thirty lexical words in Daisy's speech are lexical verbs (13 out of 30). In particular, the presence of many verbs of thinking and feeling in the list, such as *think*, *know*, *mean, feel, suppose*, might suggest that Daisy has more in her head (and in her heart) than she shows. As a term of comparison, only three verbs of thinking and feeling appear among the top thirty lexical words in Lady Mary's speech (*know, think, mean*), while only *know* and *think* feature among the top thirty lexical words of OTHERS-D.

Concordances show that in most occurrences Daisy is the subject of the verb, i.e. she expresses her thoughts directly, commenting on what is happening, for instance in the following way:

1 DAISY: I *know* it's my fault, but I wish I hadn't let him think that we're, like, sweethearts. Because we're not. Not by my reckoning, anyway.

2 DAISY: I *think* I'm more than a kitchen maid now. I want to be a proper assistant cook, I know I can be.

3 DAISY: I *think* Alfred's right. Isn't he first footman, like he says?

4 DAISY: No... I *thought* he might like me, but I were wrong. He's keener on someone else.

5 DAISY: I *thought* it'd cheer him up, give him something to live for.

Despite her apparent tendency to think and feel more than other characters, Daisy's communicative skills are limited: she uses short sentences, syntactically less complex than those of other characters. The mean sentence length of her

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lines is 6.23 words[5], which is almost two words less than the average number of words spoken by other characters of the series in each sentence (8.19). Clearly, this disparity can be explained in the light of the minor role played by Daisy in the drama: her dialogues are about 2 per cent of the entire scripts of the first three seasons of the drama and *Daisy* is the 15th character name we encounter in the frequency list of the DA corpus, after *Mary*, *Robert*, *Carson*, *Matthew* and many others. However, this difficulty in communication could be a hidden feature in the personality of Daisy: a prototypical quality of the character, more or less consciously brought about by the writer when depicting Daisy.

Examining the concordances of two other verb forms in Daisy's top 30 words, *said* and *say*, which rank respectively 11th and 12th in the list, it can be observed that only a few occurrences are used in the first person. More often, Daisy refers to things said by others. More interestingly, the few occurrences of *say* or *said* having Daisy as grammatical subject show that she would like to express things verbally, but is not completely able to do that, or, at least, not in the way she would like. For instance:

6 DAISY: Maybe I should be more outspoken and *say* what I really think...

7 DAISY: I don't know what to *say*.

8 DAISY: In fact, there's something I've been wanting to *say,* but I don't want you to take it in the wrong way...

9 DAISY: I don't know why I *said* those things

10 DAISY: I'in't that what I just *said*?

It might be claimed that Daisy has a problem in expressing her thoughts and feelings verbally. This difficulty is also reflected by a recurrent scheme in her lines, which are often interrupted or end with suspension points (24 total occurrences). Daisy's speech is not interrupted by other characters who intervene in the scene: literally, she does not end sentences and remains speechless, as if she could not find a way to continue.

The following concordances show some relevant instances:

11 DAISY: I don't know. I was thinking, first we had the Titanic–

12 DAISY: Nothing. I mean, I know I'm a dogsbody, but–

13 DAISY: But the way she flirts–

14 DAISY: That's not quite what I meant–

15 DAISY: But I never–

16 DAISY: Are you, Alfred? Because, if you are, I'd really like to say –

17 DAISY: But Miss Shore said –

It might be expected that Daisy completes her sentences in the following lines of the dialogue, or, at least, that she explains her ideas using different words, but, actually, her thoughts remain suspended. These non-fluency features can be considered as indicators of emotionality (Bednarek 2012b) and have been associated with 'impressions of nervousness, lack of confidence, shyness' (Culpeper 2001: 217). It is interesting to notice that three adversative sentences appear in the previous examples (13, 15 and 17); they begin directly with *but*. This adversative construction introduced by *but* is also a common trait in Daisy's speech (20 total occurrences), who often feels the urge to answer back or justify herself, *but*... does not fully clarify her stance, as following examples show:

18 DAISY: *But* he said he'd be here by now and he's not.

19 DAISY: *But* I'm a woman. I can't answer now.

20 DAISY: *But* I've not done it yet.

21 DAISY: *But* all them people freezing to death in midnight icy water.

22 DAISY: *But* that doesn't make it all right.

23 DAISY: *But* it's a lie.

5 This value is based on a count that identifies sentences as a 'full-stop, question-mark or exclamation-mark [...] immediately followed by one or more word separators and then a capital letter in the current language, a number or a currency symbol' (Scott 2012).

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The last two examples (22 and 23) suggest a further trait in Daisy's personality, which also reflects in her language: her strong sense of what is *right* and what is *wrong*. Both adjectives feature in the list of her 30 most frequent lexical words, respectively ranking 9th and 28th. When exploring textual cues relevant to the characterization of Daisy, it had been already pointed out that she has high moral standards. The following extracts from the DA corpus show that Daisy is not afraid of speaking out when something unfair happens around her; corpus evidence shows that in such situations her lines are not interrupted or suspended as elsewhere in the script.

24 MRS. PATMORE: His poor father's staying there with him, spending money he's not got, and travelling miles to do it.
DAISY: It's not *right*.

25 DAISY: But how? They can't talk back.
MARIGOLD SHORE: They can. That's the whole point.
THOMAS: Come on, Daisy.
DAISY: No, I don't' think it's *right*.

26 MRS. HUGHES: Marrying him was a great kindness.
DAISY: No, it wasn't kind. It was *wrong*.

27 DAISY: I told you something that wasn't true.
CARSON: Why would you do that?
DAISY: I did it as a favour for a friend, but I know now he was *wrong* to ask it of me.

Another interesting aspect in Daisy's speech concerns the quality of her sentences. According to corpus statistics there are 656 total sentences spoken by Daisy in the script; 163 (25 per cent) are interrogative sentences, which implies that Daisy asks a question every fourth sentence. All the other characters in the series total together 25,536 sentences and 5,234 questions, with a ratio of one question every fifth. Lady Mary, our reference character, asks a question every fifth sentence too.

If interrogatives are to be interpreted as a specific feature of Daisy's language, it is worth examining more in depth the type of questions Daisy asks: 83 are yes/no interrogatives, eliciting a response which is either affirmative or negative; 80 are wh-interrogatives, introduced by a wh-word and eliciting an open-ended response. Only 12 question-tags, identified as a typical feature of Britishness in movies (Chiaro 2000), can be retrieved in her speech.

When concordances are manually explored, the general impression is that Daisy asks questions naively, as a child would; still, her questions are important, because they help us understand what is happening in the drama and mark the difference between upstairs and downstairs life. For instance, in extract 28, Daisy asks for an explanation that audience members not familiar with the traditions of British aristocracy would ask themselves, if they were in the scene. Similarly, in extract 31, after asking why Matthew's job cannot be accepted by the family, Daisy receives a very sharp reply, actually addressed to anyone in the audience who doesn't understand how unbearable it is for a British gentleman to work.

Different from the previous examples, but strategic for the plot, are questions raised by Daisy in examples 29, 30 and 32: these do not stress the social distance among characters but serve as a comment on crucial developments in the story, providing further explanation to the audience. They refer respectively to the police chase after Tom Branson, who had been involved in the political protests against land owners in Ireland; the birth of Lady Mary's son, which took place, significantly, at a hospital and not at home, after Sybil's death from preeclampsia, and the Spanish Flu pandemic that almost killed Lady Cora. The questions raised by Daisy, albeit candid, drive the story and offer the opportunity for a further recap of what has happened on screen.

28 DAISY: *Why are the papers ironed?*
MRS PATMORE: What's it to you?
MISS O'BRIEN: To dry the ink, silly. We won't want His Lordship's hands as black as yours.

29 DAISY: *Do you think he's on the run from the police?*
ANNA: Don't be so daft.
THOMAS: Well, he hadn't got the money for a taxicab from the station.
MRS. HUGHES: Maybe he fancied the walk
O'BRIEN: Yes, that's it. I should think he loves a night walk in the pouring rain without a coat.

30 DAISY: *Is it because Lady Mary's in the hospital?*
CARSON: It is.
DAISY: *Does that mean she's in danger?*
CARSON: No, it doesn't mean any such thing!
MRS. HUGHES: Lady Mary will be perfectly fine, but we have to make allowances.

31 DAISY: *Why shouldn't he be a lawyer?*

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O'BRIEN: Gentlemen don't work, silly. Not real gentlemen.

32 DAISY: *What do you mean, 'she might die'?*
O'BRIEN: What do you think happens with a fatal illness? The fairies come?

5. **FINAL REMARKS**

At this point of the analysis it is possible to put in relation the most relevant aspects of the personality of Daisy – the character traits obtained by applying Culpeper's (2001) framework on textual cues – with some typical features of her speech revealed by corpus linguistics methodologies.

The following table (table 4.5) aims to combine these two complementary perspectives.

TABLE 4.5. DAISY'S LANGUAGE TRAITS VS. DAISY'S CHARACTER TRAITS

Daisy's Language Traits	**Daisy's Character Traits**
— The pronoun *I* is the most frequent item in the DAISY wordlist — Only two proper names identifying other characters in the series appear within the top 100 words of the DAISY corpus — *William* is the only proper name in her keywords	Daisy is a self-centred character with little involvement to other characters in the drama
— More interrogative sentences than the average of other characters	As a character less involved in the plot, Daisy needs to ask questions in order to better understand what happens around her.
— Sentences shorter than the average of other characters — Interrupted sentences — BUT-sentences	Daisy has difficulties in expressing her thoughts, she suffers from low self-esteem and feelings of inadequateness.
— Eight negatives within the top 100 words in the DAISY corpus — *I don't know* is the most frequent three-word cluster around the pronoun *I*	Daisy is insecure and frustrated, as a consequence of feeling exploited at work and unrequited in love
— Quantitative relevance of verbs of thinking and feeling in the first person — Lexical opposition *right / wrong*	Daisy is capable of great empathy towards others and displays a variety of emotions. Her moral standards are high.

By combining language features and personality features, the character of Daisy comes across as multi-faceted and more complex than expected. It cannot be objected that she plays a minor role in the series, but, interestingly, she does not seem to accept this minority unconditionally. On the contrary, she truly suffers from being put on the background and strives to express herself as other more active characters do. Unfortunately, her feelings do not find full expression in speech: despite the quantitative relevance of verbs of thinking and feeling in first-person, Daisy's sentences are shorter than the average of other characters. The presence of BUT-sentences or even self-interrupted sentences contributes to shaping the portrait of a fragile, insecure, almost stuttering, kitchen maid. Her frustrated side is also reflected by a relevant use of negatives.

Despite lights and shadows in her personality, Daisy is a positive character, showing high moral values and capable of great empathy for others, be they servants or masters: the relevant frequency of verbs of thinking and feeling can be interpreted in these terms, so as the lexical opposition between adjectives *right/wrong* recurring in her speech.

As a character less involved in the plot, with only two proper names identifying other characters in the series in her top 100 words and just one proper name among her keywords – *William* -, Daisy often needs to ask questions in order to understand what is happening around her. Her curiosity is however useful, as it keeps the plot developing and allows audience members to be refreshed with a quick recap once in a while.

Moving back to the research questions which were initially raised, it can be affirmed that the analysis has made it possible to depict an in-depth portrait of the character of Daisy Mason, revealing aspects beyond those that appear on screen. It has been pointed out that Daisy embodies the typical post-Edwardian servant femininity, which was socially and spatially shaped by domestic work (see Miller 2018). *Downton Abbey* has been criticised for providing a romanticised stereotype of cross-class relations and for using working women to render the past benign (Luckett 2017). Yet, an in-depth analysis of her speech has shown that Daisy is much more than a cliché: she is a silent rebel, who cannot accept not to have her say in the story and strives for improvement. Her rebellion will not remain silent for long, as major developments await her character in the last series of *Downton Abbey*. The most important begins with an interest in education, first mentioned in Season Five (Suhren 2018). At that point of the story, Daisy realizes that she needs to grow up and take on responsibility for her own life. The impact of this realization will be remarkable: she will discover her talent and her ability to learn, "a perspective that is diametrically opposed to the assessment of her competence that she voiced at the beginning" (Suhren 2018: 199) and that can be summarized by the line 'I've been nowhere and done nothing'.

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Among the aims of this article was to offer a preliminary observation of characterization in *Downton Abbey* and to explore the prototypical identity of characters. More research, extended to a wider range of characters, would be certainly needed in order to make definite claims about that. For the time being and for the space of an analysis addressed to a single character, it can be concluded that the method proved valuable, as it contributed to highlighting the key-role played by language in building a character that stands out and can overcome stereotypes: by an in-depth examination of what Daisy says, profound and hidden aspects of character have been brought about, such as a rebellious trait that is at odds with the character of a timid and reserved young kitchen maid that audience members have learned to know. In this perspective, her incomplete sentences, her naïve questions and even her silences are important, because they let us sense her most authentic nature and foresee the unexpected developments that were already traced in her character from the very beginning.

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AN INTRODUCTION TO NETWORK VISUALIZATION FOR TELEVISION STUDIES: MODELS AND PRACTICAL APPLICATIONS

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Digital Humanities; Television Studies; Network Analysis; Visual Models; Wikidata.

ABSTRACT
With the advent of open-source digital tools, abstract models have been consistently adopted in humanistic research and they have proven to be useful for many purposes: for predictive and descriptive analysis using quantitative or qualitative models, for database management, as in the case of relational models, and for modeling cultural dynamics (Gabora 2008). Among others, television scholars embraced such a trend in cultural analytics and digital humanities, by notably adopting modeling practices for assessing viewers' behaviors (Wonneberger 2009) or for measuring qualitative variations in narrative ecosystems (Pescatore and Rocchi 2018). Drawing upon this digital turn, the following paper aims to discuss the advantages, challenges and limits of adopting visual models for the analysis of large corpora in television studies. Examples of data visualization will be shown here, in application to a sample database of anthology TV series extracted through the Wikidata Query Service. A visual model available on the platform RAWGraph will be proposed as a means to identify flows of production and distribution, by looking at the country of origin and at the industrial players involved in the formation of such a network. I will therefore focus less on actual modeling, and more on model usage for academic research.

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1. **INTRODUCTION**

With the advent of open-source digital tools, abstract models have been consistently adopted in humanities computing and they have proven to be useful for many purposes: for predictive and descriptive analysis using quantitative or qualitative models, for database management, as in the case of relational models, and for modeling cultural dynamics (Gabora 2008). Among others, television scholars embraced such a trend in cultural analytics and digital humanities, by notably adopting modeling practices for assessing viewer behaviors (Wonneberger 2009) or for measuring qualitative variations in narrative ecosystems (Pescatore and Rocchi 2018). Drawing upon this digital turn, the following paper aims to discuss the advantages, challenges and limits of adopting visual models for the analysis of large corpora in television studies. Network visualizations created using the open-source tool *Palladio*, developed at Stanford University, will be initially generated to evaluate the effectiveness of looking at single serial products as networks. Moreover, examples of data visualization will be shown in application to a larger sample database of anthology TV series extracted from Wikidata through the Wikidata Query Service via a SPARQL API. A visual model available on the platform RAWGraph will be proposed as a means to identify flows of production and distribution, by looking at the country of origin and at the industrial players involved in the formation of such a network. Finally, the dataset will be displayed into a matrix-like design thanks to Polestar, to demonstrate further possibilities for the visualization of networks. Data visualization tools will be additionally considered as ways to track historical changes in the evolution of television series over time, determine the emergence of a genre, or simply explore the data available. The ultimate aim of this paper is to explore the use of network visualizations as models for humanistic research.

2. **VISUAL MODELS AND DISTANT READING**

Visual models differ from other types of models in the way they make visible a set of relationships, rather than offering simulations, running tests or undertaking computational analysis. In this sense, they can be useful for examining networks, understanding relational models, or verifying the completeness of the information and the presence of errors through data discovery processes. Developing an interrelated structure, made of assembled bits of information, implies a cognitive load that risks being demanding. This barrier can be overcome by creating an accessible visual form through knowledge design (Schnapp 2014). In other words, a structural design is often needed to access a given database's "information architecture" (Morville and Rosenfeld 2008). This means that visual models are ultimately necessary not only to process information, but also to externalize it by means of infographic tools that, through color coding and dimension rendering, are able to highlight nodes and links in a network, directional paths, level of connectedness and proximity, degrees of variations and differences. Visualization can therefore lead to meaningful learning – that is to say, the production of a deeper form of knowledge based on understanding the net of connections behind actors or concepts.

While, on the one hand, close textual analysis can be often performed easily without the need for digital tools, on the other hand analyzing cultural production and circulation on a macro-level notably poses problems related to the size and the scale of the corpus, as well as to the distance of the analytical perspective from the text, or texts, taken into consideration. To clarify the different scopes of an analytical reading in digital humanities, in 1999, Franco Moretti proposed to differentiate between a "close reading" and a "distant reading" approach to the study of literature and textual data. In opposition to traditional close reading, he outlines an "abstract model for literary history" (Moretti 2005: 8), to put objects in perspective and create a form of knowledge based on distance.

> It allows you to focus on units that are much smaller or much larger than the text: devices, themes, tropes - or genres and systems. [...] If we want to understand the system in its entirety, we must accept losing something. We always pay a price for theoretical knowledge: reality is infinitely rich; concepts are abstract, are poor. But it's precisely this 'poverty' that makes it possible to handle them, and therefore to know. (Moretti 2000: 57-8)

The level of abstraction, as Moretti himself notes, is directly proportional to the ambition of the analysis, and it comes with losses. However, if the aim is to account for macroscopic dynamics in television studies, losses will be minimized by the ability to marginalize biases and detect large-scale patterns in a more objective way, thanks to the level of abstraction granted by a distant reading. The knowledge produced by visual models ultimately results in a less biased analysis, by enabling a macroscopic and inclusive perspective.

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In a first formulation of his theory, Moretti begins from an examination of graphs, a tool imported from quantitative analysis, among other data visualizations. When talking about a study of over twenty-thousand novels, he argues precisely that

> a field this large cannot be understood by stitching together separate bits of knowledge about individual cases, because it isn't a sum of individual cases: it's a collective system, that should be grasped as such, as a whole – and the graphs [...] are one way to begin doing this (Moretti 1999: 4)

More recently, Moretti considered complex types of graphs in the form of networks: he analyses networks found within narrative forms (e.g. a network of characters, Moretti 2011). This model for quantifying the plot by observing it as a network can be used in television studies for analyzing complex narrative ecosystems. Patrick Jagoda (2016), for example, made the case of the HBO's series *The Wire*. Following Moretti's view, I will examine television series as non-discrete objects that are part of a complex network in constant evolution.

In the original business structure of linear television, a centripetal circulation of serial narratives was mainly influenced by hierarchic and oligopolistic structures in the industrial pyramid. In the contemporary scenario, however, where linear and non-linear television coexist, this centripetal movement is less evident and often has to deal with a web of peripheral economic mechanisms and coexisting socio-cultural systems. Network visualization therefore seems to be the key for observing the institutional, industrial, and cultural relations that television series foster today. Combined with more traditional forms of analysis, abstract visual models can be successfully implemented in Television Studies as a response to a much more complex transnational media environment. In this global exchange, where many players intervene, a network-based visualization can be performed with great advantages for a more accurate evaluation of the relations that television content establishes at the intersection between different media environments.

3. **MEDIA ECOSYSTEMS AND NETWORK THEORY**

The concept of network exists in close relationship with that of media as environments, or else ecosystems, a cross-disciplinary metaphor derived from biology. In media ecology this framework found several research outputs, thanks to the work of Marshall McLuhan and Neil Postman, and to more recent publications by Felix Guattari, Gilles Deleuze, Manuel DeLanda and Bruno Latour. Postman, as cited by Niall Stephens, originally suggested that "if in biology a 'medium' is something in which a bacterial culture grows [...], in media ecology, the medium is 'a technology within which a [human] culture grows'" (Stephens 2014: 2035). Similarly, Christine Nostrum had proposed to look at "complex communication systems as environments" (Nystrom 1972: 3). Building on media ecology, I embrace an ecosystemic approach to analyze televisual products at the nexus between different forces (i.e. cultural, industrial, technological dynamics) and players (i.e. production and distribution companies, policy-makers). Much like a business ecosystem, a model first introduced by James F. Moore (1993), a media ecosystem, as I define it here, constitutes a rhizomatic system made of several components and networks of relationships between them. In this sense, media are seen not as mere technological environments acting in the background, but as systems that generate networks between diverse entities.

In more practical terms, a media ecosystem framework is intended to favor a socio-economical perspective on the study of media, with consequent implementation of network theory and data-driven approaches. Within such a network framework, television series are therefore observed as parts of a "cultural forum" (Newcomb and Hirsch 1983), influenced by economic and social norms, among others. The problem of the cultural impact of ever-changing ecosystems represents indeed a fundamental question to understand regularities and tendencies in the creation and diffusion of serialized narrative forms. In key moments of media mutation and assessment on a large scale, such as the transition we are experiencing now between linear and non-linear media or the increasing hybridization of televisual forms, traditional qualitative research might encounter some challenges. How can the evolution of serial narratives be studied in relation to underlying structures and mutating processes in the television industry, which ultimately influence the circulation of content?

What I propose here is to blur the methodological boundaries and set the premises for integrating into Television Studies a quantitative approach centered on network theory, a polysemic concept that needs to be clarified. The necessity of discussing networks in cultural studies notably responds to the emergence of a global society that is increasingly connected. The rise of a "networked society" is widely discussed

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by Manuel Castells (1996), who addresses topics as varied as technological revolution, dynamics of globalization, new economy, informational flows and virtual culture, to account for a radical shift in the level of interconnectedness between contemporary human communities and systems. A network is notably defined as a set of points, symbolizing actors (individuals, groups, institutions, texts, etc.), and a set of lines, symbolizing the relations between these actors (Beauguitte 2016: 2-3). Laurent Beauguitte (2016) gives a relatively precise description of what constitutes this branch, by defining network theory as the body of methods, notions and concepts used for studying a given relational phenomenon. As he also points out, "analyzing a network does not necessarily involve using network analysis methods, and conversely network analysis methods can be used to study literary works, ecological systems, and so on" (Beauguitte 2016: 1-2, my translation).

For this reason, I suggest here to start exploring networks of serial products through network visualization as a preliminary step to then proceed with further network analysis. Both network analysis and visualization have been discussed as theoretical and methodological tools in human sciences: from sociometry (Moreno 1951) and social network analysis (Wasserman and Faust 1994), to the study of cultural dynamics, with historical (Schich et al. 2014) or industrial perspectives (Yucesoy et al. 2018). The question of a complex structure, in the form of an ecosystem or a network, and of complexity in general, emerges as a central problem also in cultural studies. For instance, building upon network science (Barabási, 2003; Newman, Barabási and Watts, 2006), Caroline Levine (2015), in her neo-formalist approach to the study of narratives, proposes to analyze networks in works of fiction. Before Levine, Franco Moretti (1999) was proposing to use abstract models and artificial constructs, such as graphs, maps and trees, for literary studies.

Following Levine's theorization, and drawing upon Moretti's modeling applications, I suggest the use of network visualization to understand contemporary television seriality, without necessarily opting exclusively for a plot analysis. As demonstrated by many research groups – Stanford University's *Literary Lab* and McGill University's *TXTLAB*, just to name a few – by using notions and visual models traditionally found in network science, scholars in the humanities can pursue a large-scale analysis of cultural phenomena, by systematically observing causalities and links between nodes. Notions borrowed from network theory – like path length, network centrality, hubs, and hinges – can therefore be effectively integrated into an interdisciplinary vocabulary for conducting small- and large-scale analysis in television studies. In the following section, I will give practical examples of how network visualization can be applied to understand intertextual references, transmedia connections, as well as patterns of production and distribution related to television series. A diversity of visual models will be considered as an introduction for media scholars who want to approach a study of networks without necessarily using more complex network analysis.

4. ANALYZING TELEVISION SERIES THROUGH NETWORK VISUALIZATION: PRACTICAL APPLICATIONS

Net-work, much like the textile metaphor of a narrative text, refers to a web of interwoven elements. The concept of plot itself serves as an interdisciplinary term, transitioning between narrative theory and more practical applications in graphic design. Used for defining a graphing technique for presenting some kind of relation between two variables, the term plot was adopted in narratology with regards for the causal and temporal patterns arranged in a story (Kukkonen 2014), in order to stress the global structure of narrative design and its inner connections. Texts and plots can therefore be studied as systems of relations, or else as networks. The metaphor of text as network – or plot – as network is the premise for one of the possible applications of visual models to television studies, where the series *is* the network – that is, the series itself established a narrative network of intertextual references between episodes. Another option is to consider television series as nodes connected to other products orbiting in the same franchise. Finally, television series can be observed as links between different media technologies and environments (e.g. broadcast television-online platforms), media industries (e.g. television-video games) or media markets (e.g. U.S. television-U.K. television).

To give a more detailed description of the applications that follow, one option when doing network visualization is to look at the information architecture and structure of each series. A second option, if the series-network expands through the addition of new nodes, as in the Barabási–Albert model (1999), is to determine dynamics of growth and preferential attachment within the network - i.e. which season, episode or element of the series is more likely to generate a franchise-effect. Otherwise, we could also find ourselves in front of a static model, where the number of

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nodes, *N*, is fixed and time invariant, such as theorized by the Erdos-Renyi model (1959). Depending on the case study and the main question, one could then use network visualization as a basis for pursuing a more complex network analysis, by evaluating degree dynamics, degree distribution, clustering coefficient. Here I will mainly address visual models in network theory, leaving network analysis for future investigations. I will notably focus more closely on the third paradigm to analyze the circulation of content across television industries and markets on a large scale. In order to examine television series as links using a visual model, a database is needed, since I am working on a corpus of several "texts" with contextual information attached, and not on a single textual unit.

For further clarifications, I will start by saying that networks can be of different types, which I will list here and then refer to with the aim of classifying the visualizations generated from this model: networks can be directed (with directions assigned to the links) or undirected (with no specific direction assigned), bipartite (between two separate sets of nodes), multigraph (multiple edges between two nodes), temporal (for each node/edge, information on the time when it appeared in the network), or labeled (containing labels like weights or attributes on nodes and/or edges). No matter which typology of network we are observing, in order to begin with a network-based methodology, and be able to proceed in the visualization with a clearer scope, we need to ask the following questions:

— What are the nodes and links?
— How can the data be collected?
— What is the size of the network (number of nodes and links)?
— What are the questions asked?
— Why is this network relevant?

To facilitate the understanding of visual models as a starting point for consequent network analysis, I will briefly evaluate the three applications mentioned above by using the visualization tool Palladio, developed at Stanford University, and then by using RAWGraph. The three case studies examined will be: television series as networks (case A); television series as nodes (case B); television series as links (case C). I notably focus on the case of the anthology series in the wake of a larger research project which I carried out as part of my Doctorate. The specific examples I give here (*Black Mirror* and *The Twilight Zone*) are therefore a selection from the limited corpus I used for my dissertation. However, each case is meant to serve as an overview on possible applications of network visualizations for all corpora in Television and Media Studies.

> Case A. **Television series as networks**

This first application considers network visualization for plot analysis of television series. The case study for this visualization will be the series *Black Mirror* (Channel 4, 2011–2014; Netflix 2016-). The case of *Black Mirror* is particularly rel-

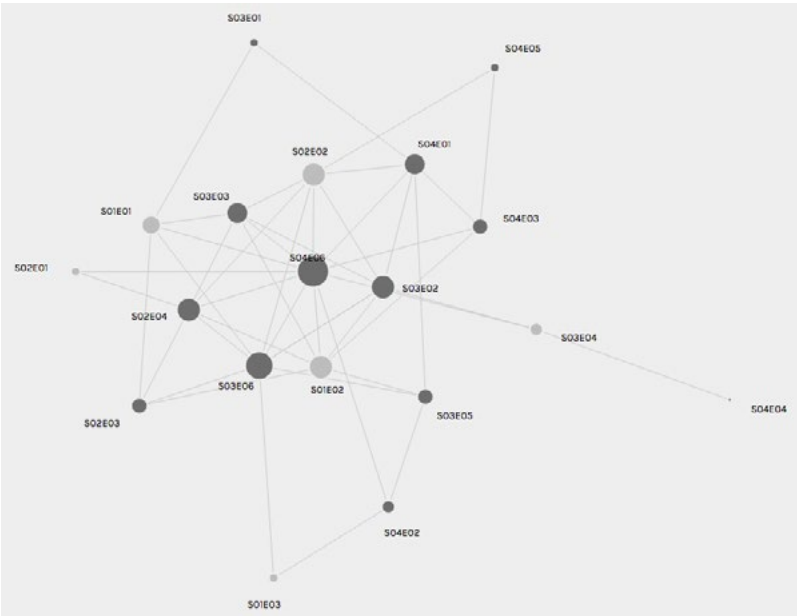

FIG.1. DIRECTED NETWORK OF BLACK MIRROR'S INTERTEXTUAL REFERENCES WITH LABELED NODES
(size of the dots= number of references; dark grey dots = referencing episodes; light grey dots = referenced episodes)

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evant because some episodes contain allusions to one or more other episodes, thus challenging a rigid definition of television anthology. Despite them being nothing more than subtextual references at the very margin of the main plot, they helped nourish a debate on whether *Black Mirror* is a shared universe or not. The list of answers in response to the questions previously listed is as it follows:

— Nodes: episodes; links: intertextual references;
— Data can be collected directly from the series;
— The size of the network is 19 nodes and 47 links;
— How many intertextual references can be found in the series *Black Mirror*?

This network is relevant for assessing the level of interconnectedness and serialization in the plot.

I traced each intertextual reference manually, with the aid of information found online[1]. Here I use the definition "intertextual references" with regard to effects of intertextual dialogism between episodes through allusions and the repetition of specific elements of the plot in more than one episode. Based on the structure of the network visualization generated thanks to Palladio *(Fig. 1)*, *Black Mirror*, compared to other examples of anthology series, might appear at a first glance as an interconnected universe. Moreover, some episodes contain a greater density of connections to other episodes, as it can be seen from the size of the dots in the graphs. In a platform perspective, given that *Black Mirror* is part of the Netflix library, this visualization might suggest a better indexing of such episodes in the platform ecosystem. This visual model also uses dots' colors, other than their size, to give information. Darker colors mark episodes that reference and lighter colors mark those that are referenced.

Such a distinction is useful to show how some episodes function as hubs that strengthen the anthology principle, which does imply some sort of connection to justify the creation of a whole collection. What we can observe from this visualization, however, is that, compared to early anthology series, today's anthologies are more fluid as far as the intertextual dialogism between episodes. Fig. 1 also shows that contemporary anthology series might foster processes in which certain episodes (or seasons) emerge over more peripheral ones. It could be interesting to check if this phenomenon has an effect on actual reception: is "Black Museum" (4.06), for one example, more watched than other episodes or it simply works, from a production standpoint, to reinforce the whole anthology-network, without necessarily causing imbalances in consumption? With this question I want to point out that using the lenses of network theory through a visual model for plot analysis does not necessarily help us to noticing microscopic dynamics inside the text, which might be easier to grasp with a textual analysis, but solicits the adoption of a macroscopic perspective of the dynamics outside the text. It creates the necessary bridge between textual, narrative analysis, and cultural, social, economic analysis by pointing at the patterns of emergence, convergence or divergence that we should investigate further. I will demonstrate this point again in case B and C.

> Case B. **Television series as nodes**

A second application can be envisaged when observing television series as nodes in a network. This approach turns out to be useful in the case of macro-anthologies, as well as with television series that entail a "transmedia storytelling" (Jenkins 2006) effect, or else other televisual forms that contain a system of references to other products, such as media franchises. In this case, nodes would be television series or other textual occurrences (films, videogames, books, radio programs), whereas links would be traced by transmedia connections via franchise agreements, but one could also define a larger network of intertextuality (Kristeva 1980) via citations, shared themes or genres and assign a value, or else assign a "weight" to each tie, thus creating a weighted network and measuring the overall network strength (Barrat et al. 2004). The case study for this application will be *The Twilight Zone* (Original series: CBS, 1959-1964; First revival: CBS, 1985-1989; Second revival: UPN network, 2002-2003; Third revival: CBS All Access, 2019), which I define as a macro-anthology subjected to franchising dynamics.

— Nodes: *The Twilight Zone* "franchise"; links: license or franchise agreement;
— Data can be collected through archival and historical research, when references cross different time-frames, or through mapping different licensing agreements from reliable online sources. In this case, I used both forms of data collection;
— The size of the network is 16 nodes and 21 links;
— How far does the macro-anthology extend as a fran-

1 Bradley, Laura (2018). "All the Easter Eggs You Might Have Missed in Black Mirror Season 4." *Vanity Fair*, January 2, 2018. https://www.vanityfair.com/hollywood/2018/01/black-mirror-easter-eggs-cameos-callbacks (last accessed 18-06-19).

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chise, in terms of trans-historical and trans-media evolutions?

This network is relevant to evaluate the limits of the contemporary anthology form, which is often thought to be a relatively rigid product because of its production norms that seem to marginalize transmedia proliferations. This original assumption might not be true for cult anthology series that survived several television eras, such as *The Twilight Zone*.

In the following visualization (*Fig.2*), as I showed in case A, darker dots represent products that reference to other products, while lighter dots are the products that are being referenced. The size of the dots indicates the number of references: the higher the number, the bigger the dot. Dots are disposed accordingly to what seems to be the structure of the network, which in this case is highly centralized around the first product of the franchise in a chronological order.

This is what *The Twilight Zone* franchise's network looks like:

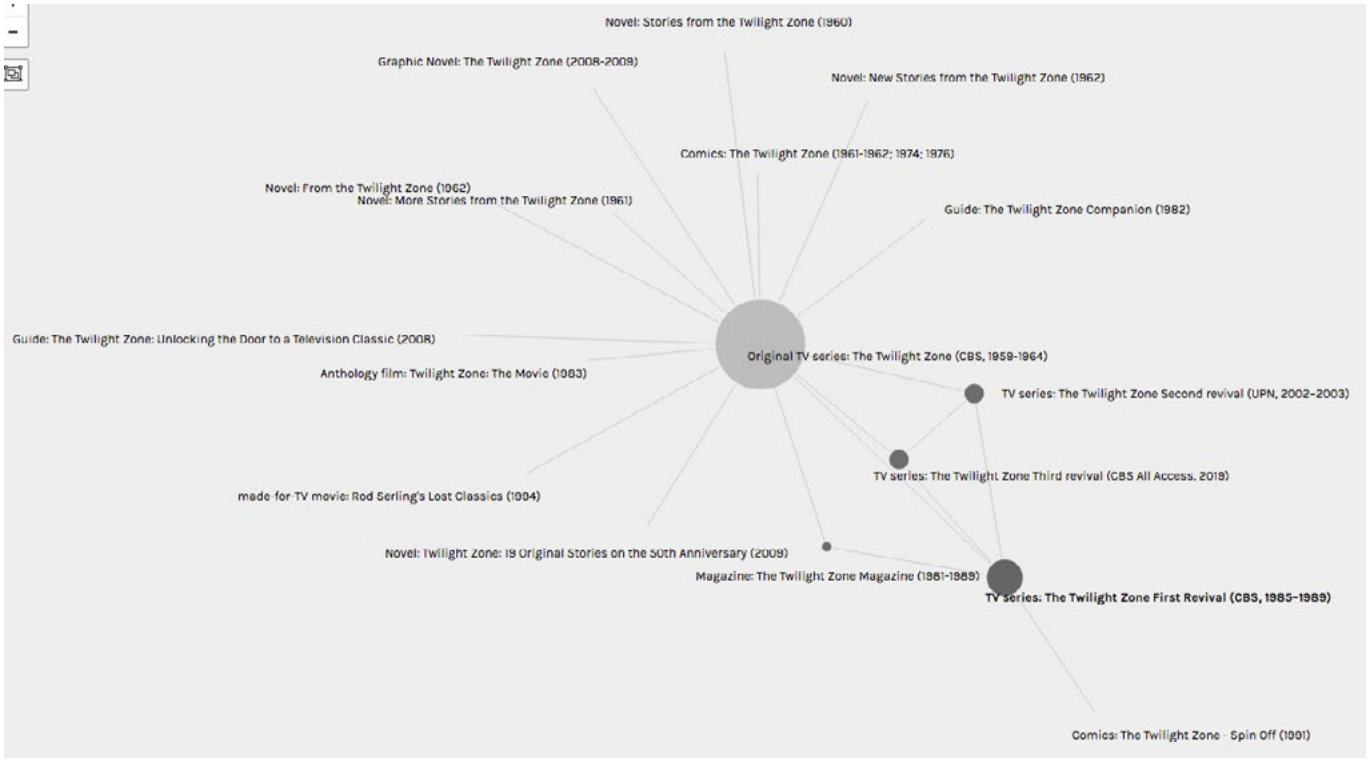

FIG.2. DIRECTED NETWORK OF THE TWILIGHT ZONE FRANCHISE'S INTERTEXTUAL AND INTERMEDIAL REFERENCES WITH LABELED NODES
(size of the dots= number of references; dark grey dots = referencing episodes; light grey dots = referenced episodes)

This visualization gives a comprehensive view of the way anthology series can generate a trans-historical and trans-media conversation creating a network. For instance, this visual model underlines the importance of revivals not only for enhancing an intergenerational dialogue, but also for expanding the discursive space of the original series. Revivals tend to generate connections. Unfortunately, the actual outcomes of the last revival cannot be collected, as it has not yet been released. Furthermore, transmedia operations in this case do not seem necessarily linked to a narrative strategy for broadening the text. Here, transmedia storytelling mainly responds to an industrial strategy: it creates a micro-economy, a small-scale market, the economy of *The Twilight Zone*.

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With their intrinsic cultural and commercial value, transmedia occurrences of this anthology series serve the purpose of moving the economy of storytelling from one media to another. As shown in the graph, *The Twilight Zone* franchise, despite finding its roots in a traditional, episodic anthology form, created a web of connections between different media, industries, platforms. In this sense, case B could be also represented with other properties associated to the nodes. In such a network, the television industry connects with the film and publishing industry, as much as CBS connects to UPN (showing the presence of a commercial deal). Reflecting on television series as objects that can connect industries, platforms, or even countries and cultures broadens the spectrum of the analysis to interesting observations about the cultural capital of television series as popular products. Case C represents a preliminary study of such an industrial network, designed to be expanded in application to bigger datasets.

> Case C. **Television series as links**

One of the most interesting applications of network theory and visual models for the analysis of television series can be tested with regard to the cultural interactions they foster. Let us imagine a network of institutional entities where television series are the links. This application can be adopted for the analysis of a single case study or for the analysis of a much bigger corpus. In the event of a large enough corpus, the network is the database itself made of links and nodes and following a relational model which I will discuss in the next paragraph. Beneath a platform like the IMDb, for example, lies the structure of a network. Here I will provide a small-scale example of a network visualization model where television series are links.

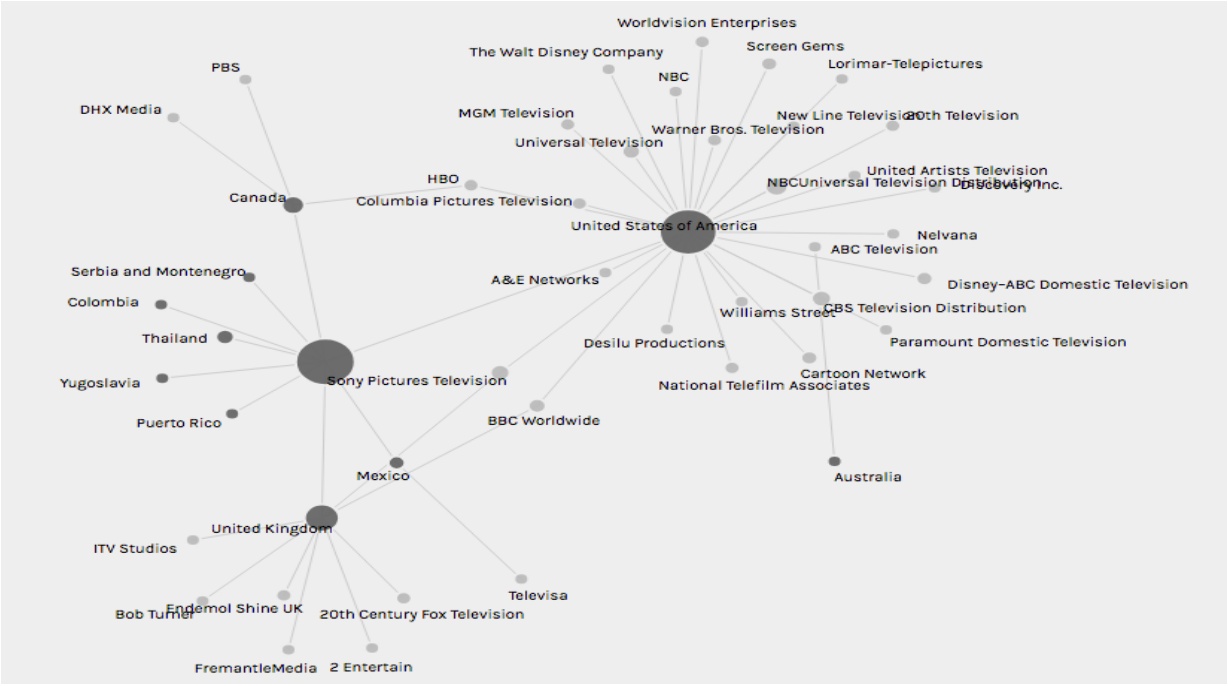

FIG.3. DISTRIBUTION NETWORK OF *THE TWILIGHT ZONE*'S SERIES (ORIGINAL AND REVIVALS) WITH LABELED NODE
(size of the dots = number of industrial connections; dark grey dots = original series and revivals; light grey dots = distribution companies/institutions)[2]

- Nodes: countries, institutions, television channels or platforms; links: anthology series (*The Twilight Zone*);
- Data can be collected from Wikipedia, IMDb, Television Archives;
- The size of the network is 41 nodes and 45 links;
- How many institutional entities were involved in the production and distribution of *The Twilight Zone*?

2 This image is a screenshot from a dynamic visualization made on Palladio's platform. A better visualiza-tion of the image is possible through the platform itself and using a large screen.

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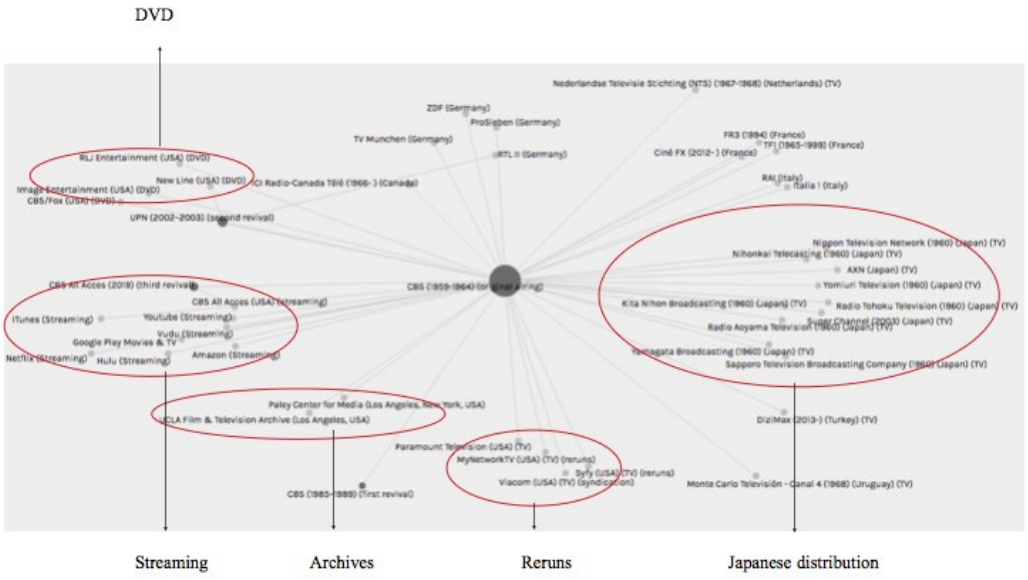

FIG.4. DISTRIBUTION NETWORK (DIRECTED AND LABELED) OF A CORPUS OF ANTHOLOGY SERIES
(size of the dots = number of connections; dark grey dots = country of origin; light grey dots = distribution companies)[3]

3 This image is a screenshot from a dynamic visualization made on Palladio's platform. A better visualiza-tion of the image is possible through the platform itself and using a large screen.

This network is relevant for evaluating how the lineage of the series *The Twilight Zone* colonized the industrial and cultural space.

Fig. 3 gives a glimpse of how the network might look, with clusters based on the country in which the content is distributed (e.g. Japan) and the way it is accessed by the audience (public broadcasting, cable TV, streaming services, Archives, DVD and so on).

The visualization above (fig.3) expands radially from the original producer (CBS), which represents the source-hub. Such a centric structure was already detected in case B, where the original series appears to be the main product in the franchise generating transmedia dynamics of preferential attachment towards other products. Not much else can be said about this temporary visualization at the current stage, except that it gives interesting hints on how to use visual models for detecting institutional networks. To better explain this third approach, I extracted a larger database from Wikipedia thanks to the Wikidata Query Service.

5. **WORKING WITH WIKIDATA AND RAWGRAPH**

The Wikidata Query Service allows to automatically extract linked open data from the Wikipedia platform. The data extracted contain information on a sample database of over three hundred anthology series (title, country of origin, production company, distribution company). Using Palladio, a network visualization of Wikipedia data about both early and contemporary anthology series takes the shape shown in Fig. 4.

This graph helps define the main production "hubs" of anthology series, which turn out to be the United States, United Kingdom, Canada (without counting the big unlabeled node that puts together several small markets like Serbia or Puerto Rico). However, it is evident that this dataset contains anomalies and it needs to be filtered and combined with a more complete list. To detect errors (e.g. blank columns) one could initially opt for a different visual model that is more efficient in delivering the information needed.

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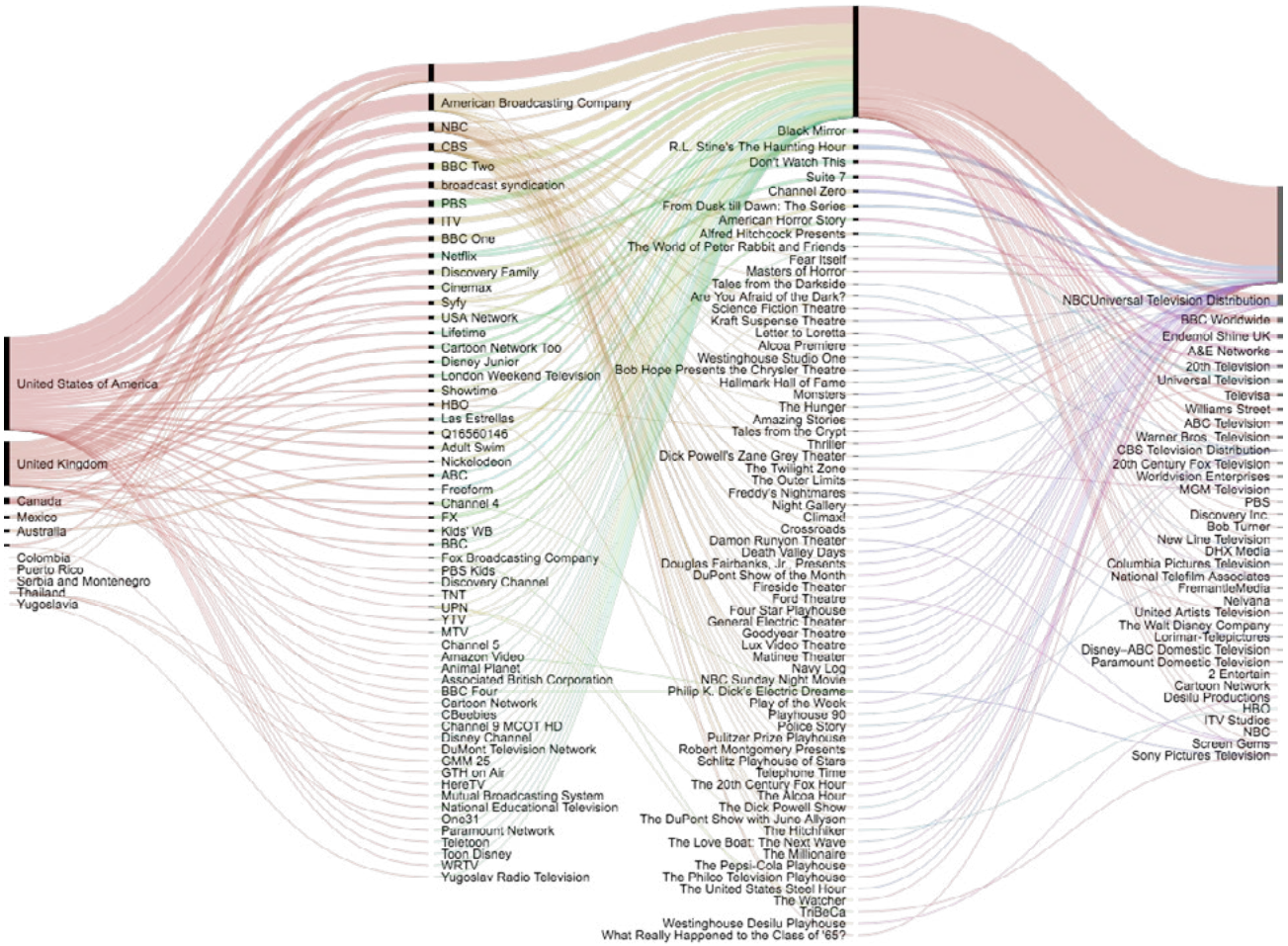

FIG.5. ALLUVIAL DIAGRAM (RAWGRAPH) OF ANTHOLOGY SERIES FROM A WIKIPEDIA SAMPLE DATABASE

The same data concerning institutional networks can be visualized using other visual models and opting for matrices or alluvial diagrams. Thanks to the open source data visualization tool *RawGraphs*, I was able to visualize clusters: in *fig. 3*, I found clusters in the circulation of content, grouped by type as platforms, archives, DVD distribution and others. Additionally, I underlined flows from a sample database of anthology series, by following their paths from production to distribution and by detecting tendencies or major data-filtering errors. For this visualization, I used the alluvial diagram model. "Alluvial diagrams [...] represents weighted flows among nodes. [...] We will call 'nodes' the black rectangles. We will call 'flows' the colored areas linking nodes. We will call 'steps' the vertical groups of nodes."[4]

A visual model in the form of an alluvial diagram turns out to be particularly useful, even before data analysis, for data discovery, since it connects otherwise scattered information into a series of common itineraries traced by the circulation of content from the country of origin (first column), to the producer (second column), the title of the content produced (third column) and the distributor (fourth column). In the data-discovery process that this visual model allows for, we clearly see that null values and missing information are causing problems in the analysis of the dataset, generating ambiguity. Data discovery is therefore fundamental, and other visual models can be associated to this alluvial diagram to make sure the undefined section is properly signaled.

In fact, since data analysis is often introduced in Cultural Studies to minimize potential biases derived from an individual perspective, it is important to make sure that the database available is accurate, or at least to be aware of its gaps.

4 https://rawgraphs.io/learning/how-to-make-an-alluvial-diagram/

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When a database is extracted through the Wikidata Query Service, it comes as a relational model, where tabular data are stored in a *.csv* file. While a relational model, which takes the shape of a table and describes a series of relations, can be used for data storing and processing, a visual model contributes to a better understanding of the database. It facilitates the observation of the links between objects and helps detect issues or anomalies. At this stage, further research was required in order to clean data extracted from Wikidata through the Wikidata Query Service and merge them with data from IMDb. For this purpose, I used Python and the fuzzy matching algorithm. The merged datasets can be visualized using the graphical user interface Polestar (fig. 6) accessible directly from the Wikidata Query Service, in order to verify the number of undefined elements in a separate and labeled row. Here, I present, in the form of a matrix microscope (Schich 2010), a visualization of a corpus of anthology series, listing the country of origin on the y axis and the genre on the x axis.. Additional information can be visualized in this graph as we proceed into further cleaning of the data with Python, such as the production company (color of the dots) or the number of seasons (size of the dots).

CONCLUSION

In this paper, I considered networks that are bipartite, directed and labeled (fig. 1, fig. 2, fig. 3, fig. 4). By doing so, I showed that visualizing television series as networks, nodes, or links through visual models can offer a guidance not only for putting the text into context, but also for learning about our data. Cleaning data, solving anomalies and introducing information from peripheral television markets – or at least acknowledging what is missing – opens up for new perspectives on media industries. In an oligopolistic market, subjected to dynamics of media imperialism, it was quite intuitive to guess which television company was the most powerful and influential. As the old oligarchic industrial structure increasingly loses its power and dynamics of "asymmetric interdependence" (Straubhaar 1991) prevail to a binary model, detecting overlapping networks on a transnational level is not quite obvious, and we risk focusing only on content already "exposed" in television markets. With the global trade in television, it now seems obsolete to discuss a simplistic friction between dominant *versus* dominated industrial players. Furthermore, in a "long tail economy" (Anderson 2006), even

FIG.6. MATRIX VISUALIZATION OF ANTHOLOGY SERIES FROM A WIKIPEDIA/IMDB'S DATASET USING POLESTAR[5]

5 This image is a screenshot of the Polestar's work environment in order to show the process that eventually leads to meaningful visualization. Here, I opted for a screenshot that can be better integrated within an article in compliance with editing needs. However, the full final visualization can be exported directly from the platform and visualized on a larger screen space.

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less popular products can make a difference in niche markets. Both large and small networks are important.

The cases described above can contribute to reach interesting conclusions, by adopting a methodological framework that overcomes the biases of looking mostly at commercially successful content. Working on a subgroup of anthology series, but still admitting the possibility of working on a larger corpus, facilitated this introductory application of visual models for understanding television products and industries. In case A, I observed that contemporary anthology television series can incorporate internal references without necessarily creating a whole, interconnected narrative world. Case B further demonstrated that contemporary anthology series can generate transmedia effects as part of the same universe, even without expanding the same world, by generating parallel worlds instead, in a sort of "parallel world-building". Finally, case C inserts anthology series in the surrounding media ecosystem, showing how they can be part of a global trade through cross-cultural, cross-historical, cross-country, cross-platform movements. By tracking dynamics of cultural exchange, researchers can isolate the hubs that export the most and have a higher impact, or those nodes that help to connect several countries.

Each entity from the tabular form was mapped using several visual models: graphs made of vertices and edges, alluvial diagrams made of directional flows and matrices. To this point, it is interesting to note that nodes and links as self-existent, unconnected units do not tell us much when it comes to the plot of anthology series or to their cultural and industrial value. On the contrary, they do assume a meaning when visualized as networks on a macroscopic level, showing that "network" is not simply a metaphor, but a full methodology for data visualization, manipulation, discovery and analysis. With their ability to trace and make visible cultural transactions, network visualizations improve our understanding of major industrial dynamics and can be scaled-up or down depending on the type of reading one needs to perform (distant or close). Combining visual models of networks represents an interesting interdisciplinary strategy through which researchers can acquire a more objective perspective on ongoing industrial, economical and socio-cultural dynamics related to the circulation of televisual content. Even more concrete results are expected as media scholars gain access to larger and more complete digital archives and databases, which allow to perfect these visual models and create useful information.

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VIDEO SCENE SEGMENTATION OF TV SERIES USING MULTI-MODAL NEURAL FEATURES

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KEYWORDS
Scene segmentation; TV series; Neural features; Multimodal fusion; Unsupervised.

ABSTRACT
Scene segmentation of a video, a book or TV series allows them to be organized into logical story units (LSU) and is an essential step for representing, extracting and understanding their narrative structures. We propose an automatic scene segmentation method for TV series based on the grouping of adjacent shots and relying on a combination of multimodal neural features: visual features and textual features, further augmented with the temporal information which may improve the clustering of adjacent shots. Reported experiments compare the combination of different features, video frames sub-sampling and various shot clustering algorithms. The proposed method achieved good results, using different metrics, when tested on several seasons of two popular TV series.

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1. INTRODUCTION

We witness narrative structures everywhere in our daily lives. Movies, books or TV series are major sources of narrative structures. They help us to interpret our actions and give meaning to our lives. Understanding the narrative structure of TV series through automatic processing is thus a very interesting problem despite its complexity, and researchers on computational narratives believe that it may become a new area of artificial intelligence.

Extracting the narrative structure of a TV series can be addressed by dividing it into simple and specific modules that perform part of the task. One of the basic modules is the segmentation of a TV series into scenes. Having a solid scene segmentation system will have a vital role for performing scene analysis and understanding the narrative structure.

Our work focuses on an automatic scene segmentation system of TV series, using multimodal features extracted through deep neural networks. The multimodal nature of the video makes scene segmentation tasks difficult. On top of that, the definition of a scene can differ based on the TV series we are dealing with and depending on the people analyzing the problem.

Many papers define a scene differently according to the problem they are dealing with. We compose our definition from Bost (2016) and Kumar, Rai, Pulla, & Jawahar (2011) who defined a scene as a set of contiguous shots which are connected by a central concept or theme or coherent subject.

Even if some works rely on speaker diarization (i.e. characters occurrences within a scene) for scene segmentation Ercolessi, Bredin, Sénac, & Joly (2011), scene definition cannot be based on the set of characters. In most TV series, like *Game of Thrones* (2011-2019), when several new characters appear while others disappear, it is usually a serious hint of a scene change. However, there is a lot of counterexamples -- where the topic changes while the set of characters stay the same or where the topic stays the same even if some characters have left. Besides, some sitcoms include some characters that appear in almost all of the scenes of the TV series, like *The Big Bang Theory* (2007-2019).

Del Fabro and Böszörmenyi (2013) believed that "finding scenes in TV series and sitcoms is simpler than finding scenes in movies". But we believe this may not always be the case. Some TV series are very complex and can, in fact, be more complicated than a standalone movie. TV series and sitcoms are typically characterized not only by a fixed group of actors and a limited set of locations where the plot takes place, as explained by Del Fabro and Böszörmenyi (2013), but they also present a different range of stories and different parallel stories within each episode. Their characteristics, especially the protagonists, may remain the same across all episodes even as they evolve through the episodes, whether mentally, behaviorally and physically.

The segmented scenes will have an important role for extracting and understanding the narrative structure of a TV series. Furthermore, it will be used to create links between different scenes and connect the intertwined stories. If a scene segmentation method achieves good results for one episode it is likely that it will work well with the rest of the episodes.

The main contribution of our paper includes the following core points.

1. We propose a method for automatically segmenting a video into scenes using multimodal features.
2. We propose to use well-known, pre-trained deep neural network models to extract features from the frames of the video and we combine them with the word embedding of video's subtitles based on a shot. We also use each shot's temporal information as a feature to group shots that are closer to each other. Using all the features makes it possible to use the multimodal nature of a video.
3. We design a sequence-splitting algorithm to group together shots from the clustering step. This results in sequences of shots belonging to each scene and makes it possible to perform further processing at the scene level.

Our paper is organized as follows. In Section 2, we will cover prior work on video scene segmentation. Next, we will discuss our methods in Section 3. In Section 4, we will present the dataset used and introduce our results. Finally, the conclusion and future work are presented in Section 5.

2. RELATED WORK

Del Fabro and Böszörmenyi (2013) surveyed 20 years of video scene segmentation, discussing the methods investigated by many researchers using different algorithms. They categorized the approaches based on the combination of three classes of low-level features – visual, audio and textual – resulting in seven categories.

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Deep learning recently gained popularity for visual features extraction (Baraldi, Grana and Cucchiara 2015, Protasov et al. 2018). For example, Protasov et al. (2018) compute deep convolutional features using the Places205-AlexNet image classification network, motivated by the idea that the shots of a scene share a common surrounding. We want to extend this visual surrounding with the verbal context of a scene. Bost (2016) developed a video scene segmentation framework that segments the video content into story units. Bost's (2016) framework is formulated in a statistical fashion and uses the Markov Chain Monte Carlo (MCMC) technique to determine the boundaries between video scenes. He tried to use visual content and speech content of the video.

It is also possible to transform the scene segmentation problem into a graph problem, as did Yeung, Yeo and Liu (1998), Sidiropoulos et al. (2009), and Ercolessi et al. (2011). They used minimum edge detection for grouping adjacent shots into scenes. Kumar et al. (2011) propose bag of visual words of a shot and a post clustering based on a graph. They used a color histogram with a threshold to detect the shot boundaries, then picked key frames and did clustering based on their histogram and finally computed the similarity of shots with their neighbors. But we believe that the colors do not carry all the information needed for scene segmentation.

On the other hand, the segmentation problem can be considered based on text only, the most famous text topic segmentation algorithms being Texttiling and C99. Texttiling (Hearst 1997), which mainly subdivide texts into multi-paragraph units that represent subtopics, makes use of patterns of lexical co-occurrence and distribution, and C99 (Choi 2000) used ranking scheme and the cosine similarity measure as their main step for text segmentation. Utiyama and Isahara (2001) have used a statistical approach that tries to find the maximum probability of a text's segmentation. Their method does not require training data and they claim it be applied to any text. Guinaudeau, Gravier, and Sébillot (2012) proposed modifications of the computation of the lexical cohesion to make the algorithm proposed by Utiyama and Isahara more robust to TV programs automatic transcripts peculiarities (compared to written text). Scaiano et al. (2010) perform scene segmentation in a movie using the text of the subtitles. They used a vector of Synsets instead of a vector of words with the cosine similarity.

Various metrics can be used for the evaluation of scene segmentation. Purity and coverage, for example, which are borrowed from clustering evaluation metrics, are used by Ercolessi et al. (2011) and Del Fabro and Böszörmenyi (2013). Recall and Precision, from Information Retrieval evaluation, are also used to evaluate segmentation algorithm, by Baraldi et al. (2015) and Chasanis, Likas and Galatsanos (2009), for example. Recall and precision are used in order to estimate how accurate the detected boundaries are. There is an argument that these metrics are not quite appropriate for segmentation systems. WindowDiff (Pevzner and Hearst, 2002) and Pk (Beeferman et al., 1997) measures were defined especially for topic segmentation evaluation. Beeferman et al. (1997) defined Pk as the probability that two sentences drawn randomly from the corpus are correctly identified as belonging to the same document or not. Pevzner and Hearst (2002) define WindowDiff that counts the number of boundaries between the two ends of a fixed-length window and compare this number with the number of boundaries found in the same window of text in the reference segmentation. Pk and WindowDiff values increase in case of over- or under-segmentation, and decrease for improved segmentation. The evaluation metrics will be discussed in Section 4.2.

3. METHOD

Recently, features extracted through deep neural networks have gained widespread interest thanks to their very competitive performance in a large range of applications, especially in image processing and natural language processing. So we intend to use well-performing pre-trained models for video frames feature extraction and textual feature representation.

Our processing workflow is organized as follows. First, the video is analyzed into frames and split into shots thanks to a shot boundary detection method. Frame-level visual features are then computed and aggregated for each detected shot. At the same time, the textual features are generated from the subtitles for each shot. The temporal information of each shot, both the starting and ending time are also considered to help the clustering method consider the closeness of the shots. The features from each modality are combined in different ways. An inter-shots similarity matrix is computed, based on the resulting features, and allows for a shot-based threading algorithm to assign a cluster to each shot. Like C99 segmentation technique by Choi (2000), we also apply a ranking to the similarity matrix, where the rank is the number of neighbouring elements having a lower similarity value within a neighbourhood window of 5. Finally, adjacent shots are grouped into scenes using Algorithm 1. The whole general method is depicted in Fig. 1. The steps are discussed in detail in the following subsections.

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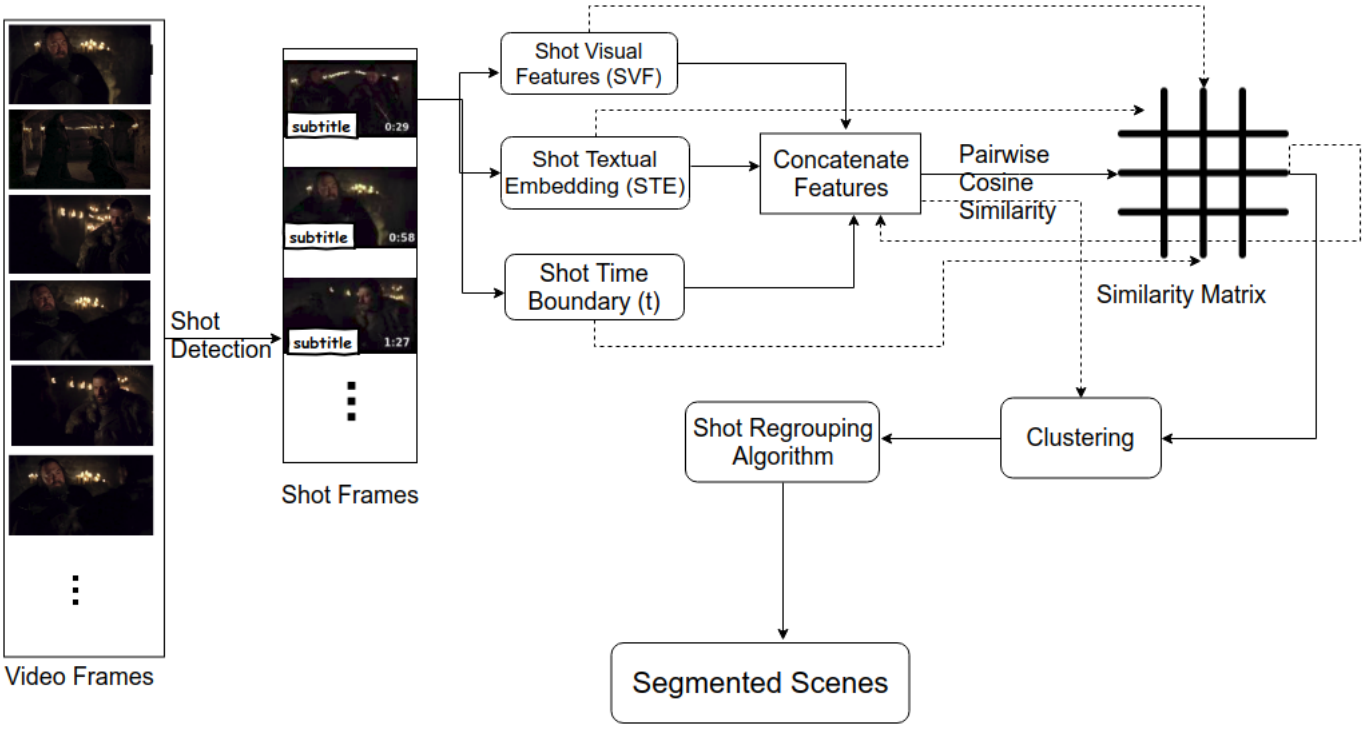

FIG. 1. SCENE SEGMENTATION METHOD

The broken lines show the late fusion of the features, where similarity matrices are computed for each feature set and then combined to be fed into the clustering module. The straight lines show early fusion of features, meaning that the similarity matrix is computed using the combination of the features.

3.1 **Shot detection**

We use a shot boundary detection (SBD) algorithm implemented in the open-source Pyannote-Video toolkit (Bredin 2015), which is based on displaced frame differences (DFF) and uses landmark features of the frames. It depends on some hyper parameters like the frame height, the duration of context window and a threshold on the similarity measures between shots.

We use a manually annotated TV series corpus described in Bost (2016) to optimize the above parameters. Bost (2016) provided manually annotated shots of the first seasons from each of the TV series reported in Table 1. The shot detection technique had an average shift of 0.04 seconds for the correctly detected shot boundaries, which is equivalent to one frame per shot. The accuracy of the optimized automatic SBD is 85% and 81% for *Breaking Bad* (2008-2013) and *Game of Thrones* (2011-2019), respectively.

3.2 **Features Extraction and Shot Representation**

The visual stream of a video V, is a sequence of frames, which can be further processed into a stream of visual features. In our experiments, we use the VGG16 pre-trained model provided by Simonyan and Zisserman (2014) to extract deep visual features for each frame and VGG16-places365 by Zhou et al. (2017) to extract scene's features of a frame. Thus, for the set of frames belonging to each shot, visual features are extracted following the above method; we refer to them as Shots Visual Features (SVF)[1].

The subtitles of the audio stream of a video also carry important semantic information. Therefore, we built a word2vec model for the word representation of each

1 SVF is the shot visual features, we have used CFF which is the central frame shot features. SVF and CFF can be used interchangeably in this document.

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word in the subtitle using the well-known Gensim word-2vec model from Řehůřek and Sojka (2010). We compute the textual features of a shot, in the same way as the visual feature, and refer to it as Shot Text Embedding (STE), using a word-embedding model built using all the subtitles of the respective TV series. In the case of *Game of Thrones* (2011-2019), we also use the text of the books and the pre-trained Gensim word2vec model to build our own word embedding model.

Furthermore, we add the temporal information of the shots for closeness by taking the start and end time of a shot. Consecutive shots that have short duration may have less time difference, therefore the temporal information will help to capture that and in return helps the clustering part. The temporal feature is normalized with regard to the total length of the video in order to present values between 0 and 1.

3.3 **Feature Selection and Augmentation**

While the length of each shot is variable, shot-level features have a fixed dimension. In our experiments, the dimensions for a video are as follows: Nx25088 for the SVF, Nx300 for the STE and Nx1 for the temporal feature, where N is the number of shots detected from the video. Given the variable number of frames within a shot, we test two aggregation methods for combining the frame-level visual features into fixed-size shot-level features, but taking the central frame of a shot performs better. Then we flatten the frame features and get the dimension of Nx25088. Next, we augment all the shot features as depicted in equation 1.

$$F(S) = [f(Fi)] \oplus E(S) \oplus time(S) \quad (1)$$

Where n is the total number of frames in shot S, i refers to a frame in the shot S, the $[f(Fi)]$ refers to the selected shot features and f is a function representing the deep features (features extracted from VGG16 or VGG16-places365 pre-trained model) of shot i and E is the text embedding (features) of shot S, the $\oplus$ operation represents the concatenation operation of the features. We have tried averaging the SVF and taking the average of the frame features inside a shot, by replacing $[f(Fi)] as \left[\frac{1}{n}\sum_{i=1}^{n} f(Fi)\right]$ in equation 1. The features subsampling is performed by selecting M frames within a shot. We test both random and uniform sub-sampling; in the latter case we use a step value S where S = N/M. Though, we perform the above combination of features, taking the central frame of a shot and extracting its features performed better and computed faster than averaging and subsampling of the frames of a shot.

3.4 **Shot threading**

Shot threading is important because a scene typically consists of an intertwining of shots, with alternate points of view on the characters and on the set. Thus, shot threading is a meaningful intermediate step between the shot segmentation and the scene segmentation, rather than directly clustering the shots into scenes.

With the concatenated shot features F(S) obtained so far, which is a late fusion of shot features, we compute a similarity measure between each pair of shots using the cosine distance and build the inter-shots similarity matrix. On the other hand, we also perform early fusion of features and then compute the similarity matrix of the shots. We compare three different clustering algorithms, i.e., K-Means, Spectral clustering and Affinity propagation. We report the results using these algorithms on Tables 2 and 3.

3.5 **Shot Grouping**

We propose the following, Algorithm 1 to group the shots labeled after the shot threading together into scenes. The motivation behind it is the fact that the result of shot threading is a sequence of labeled shots and at this stage, we can consider the scene segmentation problem as a problem of grouping sequence of adjacent shots together (Vendrig and Worring 2002), with the objective of maximizing the coherence of the resulting segment.

The algorithm performs the grouping of a sequence of shot threads based on the parameters K and C (where K is the sliding window size which is used to slide through the sequence of shot threads and C is the number of different shot threads) into a set of similar threads which are the scene or logical story unit. To our knowledge this algorithm is original, even if sequence grouping algorithms were proposed for other tasks like Vendrig & Worring (2002), which was motivated by biological sequence alignment of proteins, but ours presents a lower complexity.

Figure 2 depicts an example of sequence grouping into scenes, to illustrate algorithm 1. In this example, we have 6 clusters (c1 – c6) for the 15 shots. The K and C values are set to 3. The window slides until the end and the algorithm checks the number of different clusters (C) inside

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ALGORITHM 1. SHOTS SEQUENCE GROUPING

```
procedure SCENE_SEGMENTATION (S, K, C)
S: sequence of labels,. K: window size,.
C: number of different speakers
tempList ← S[0 : 2] . initialize tempList
by the first 2 labels from S
sepPos ← [] detected scene boundaries
count ← 0
if len(S) <= 2 then
return sequence too short
else
for i in range(2,len(S)) do
        if S[i] = tempList[–1] then
                continue
        else if S[i] in tempList then
                tempList.pop(0)
                tempList.append(S[i])
        else
                count ← count + 1
                if len(tempList) < K then
                        tempList.append(S[i])
                end if
        if count = C then
                sepPos.append(i – C)
                count ← 0
        end if
    end if
  end for
end if
return sepPos
end procedure
```

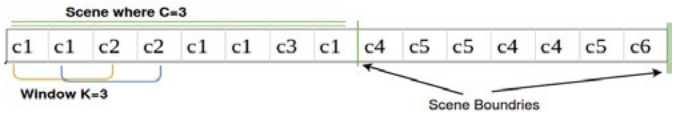

FIG. 2. EXAMPLE OF SHOTS GROUPING INTO SCENE

the window (size K). Therefore, according to the algorithm, the shots are segmented into two scenes as can be seen on Fig. 2.

4. EXPERIMENTS

We perform weakly supervised video scene segmentation of TV series using the techniques discussed in Section 3, comparing various clustering algorithms and different features as it will be discussed in Section 4.3. First, we present the dataset and the experimental setup.

4.1 Dataset and experiment setup

The dataset consists of 2 TV series – *Game of Thrones* and *Breaking Bad* – which we believe have complex and intertwined scenes and stories. We use the first 5 seasons of *Game of Thrones* and the first 3 seasons of *Breaking Bad*. For both series, we evaluate our systems using the manual annotation into shots for the first season and the manual annotation into scenes for all the dataset provided by Bost (2016)[2].

The data is split into a development and a test subset, as shown in Table 1. The first 3 seasons of *Game of Thrones* and the first 2 seasons of *Breaking Bad* are used as development set and the rest of the data for each series is used as test data[3]. We use the shot detection method discussed in Section 3.1 and evaluate its performance on the manual shot annotation provided by Bost (2016). This resulted in an accuracy above 85% and 81% for *Breaking Bad* and *Game of Thrones* respectively, which we found reliable enough for further processing.

TABLE 1. CONTENT OF THE DEVELOPMENT AND TEST DATASETS

Development Dataset

	Game of Thrones		*Breaking Bad*	
	Quantity	Average Time (h/m/s)	Quantity	Average Time (h/m/s)
Season	3	7.1h	2	7.6h
Episode	27	46.07m	18	45.7m
Scene	753	126.9s	459	120s
Shots	27396	3.4s	10814	5.1s

Test Dataset

	Game of Thrones		*Breaking Bad*	
	Quantity	Average Time (h/m/s)	Quantity	Average Time (h/m/s)
Season	2	7.9h	1	9.8h
Episode	20	46.07m	13	45.7m
Scene	460	140s	270	131s
Shots	17913	3.5s	5875	6s

2 Dataset: https://ndownloader.figshare.com/articles/3471839/versions/3

3 There are some missing episodes. In *Game of* Thrones, Season 02 Episodes 03 and 09, and Season 04 Episode 01; in *Breaking Bad* Season 01 Episode 05.

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4.2 **Evaluation Metrics**

As many papers have used the coverage and purity clustering evaluation metrics, we have reported purity and coverage measures in our tables.

We also use the frequently used topic segmentation metrics, WindowDiff and Pk. Both WindowDiff and Pk use a sliding window over the segmentation; each window is evaluated as correct or incorrect or as true or false. Equation 2 and Equation 3 show how the Pk and WindowDiff are computed, respectively.

$$P_k = \frac{1}{N-k}\sum_{i=1}^{N-k} f\big(f(ref_i, ref_{i+k}), f(hyp_i, hyp_{i+k})\big) \quad (2)$$

where ref and hyp are the manual segmentation (ground truth) and automatic segmentation, respectively. N is the total number of shots of an episode. k is the window size which is set to half of the average true segment size, according to Beeferman et al. (1997). In our case, we have set to 20 for *Game of Thrones* and 11 for *Breaking Bad*. The function f is 1 if the arguments are equal and a 0 if not.

Pevzner & Hearst (2002) claimed that Pk is unintuitive and come up with WindowDiff. WindowDiff is an amended metric of P_k, as can be seen in Equation 3.

$$WindowDiff(ref, hyp) = \frac{1}{N-k}\sum_{i=1}^{N-k}(|b(ref_i, ref_{i+k}) - b(hyp_i, hyp_{i+k})| > 0) \quad (3)$$

where b(i,j) represents the number of boundaries between positions i and j. The remaining symbols are the same with the above P_k symbols.

We compute recall and precision measures at shot level[4] of the scene segmentation of the video. Recall is the fraction of correctly grouped shots over the total amount of correct shot levels. Precision is the fraction of correct shots among all correctly grouped shots. Both are combined into the F1-score, defined as the harmonic average of precision and recall.

$$Recall = \frac{\#correctlydetectedshotsofhyp}{|ref|} \quad (4)$$

$$Precision = \frac{\#correctlydetectedshotsofhyp}{|hyp|} \quad (5)$$

where $|ref|$ is the total number of shots inside a boundary of the reference (ground truth boundaries) and $|hyp|$ is hypothesis (automatically segmented boundaries).

The shot level recall and precision may not indicate how good the scene segmentation is. Since a single frame (0.4s) or a single shot shift from the ground truth may cause an incorrect boundary at the scene level. As Baraldi, Grana and Cucchiara (2015) stated, "precision and recall fail to convey the true perception of an error". Therefore, we have introduced tolerance to the recall and precision measurements at a scene level. We set a tolerance of 3 shots[5] to the left or to the right of the boundary. In this shot tolerance, the boundary of a scene automatically generated will be considered as correct, if its boundary is 3 shots away from the ground truth.

4.3 **Results**

We compare the different shot features and their multimodal fusion. The results presented in Table 2 are based on central frame features (CFF) of a shot considering late fusion (combining the features after we compute the similarity matrix) and Table 3 shows the comparison of segmentation results with Bost (2016) work using the same data. The features show good performance with all metrics and for all clustering algorithms. The Kmeans and spectral clustering give the best results. In case of affinity propagation, the number of clusters is set by the algorithm itself and it may result in a large number of clusters. Thus the result of affinity propagation varies from episode to episode, whereas the spectral and Kmeans clustering are set to 40 clusters as optimized using the development dataset and its result is stable.

TABLE 2: RESULTS OF SCENE SEGMENTATION

using CFF, TSE and temporal information (t) based on early fusion, with the similarity matrix computed from the combined features

Game of Thrones

Clustering	WinDiff	Pk	Coverage	Purity	Recall	Precision	F1
Spectral	**0.03**	**0.01**	0.49	**0.91**	0.53	0.29	0.39
Kmeans	0.03	0.01	**0.61**	0.86	0.55	**0.47**	**0.51**
Affinity	0.03	0.01	0.43	0.91	0.50	0.23	0.31

Breaking Bad

Clustering	WinDiff	Pk	Coverage	Purity	Recall	Precision	F1
Spectral	0.07	0.04	0.61	**0.82**	0.59	0.51	0.54
Kmeans	**0.05**	**0.03**	0.63	0.80	**0.61**	**0.53**	**0.57**
Affinity	0.07	0.05	**0.65**	0.78	0.51	0.48	0.49

4 Shot level precision and recall around 0.95 are very high values but they don't guarantee that a scene boundary is correctly detected.

5 Using this 3 shot tolerance, the average distance between automatically generated boundaries and ground truth equal 16.5 and 15.4 seconds (with our best system), for *Game of Thrones* and *Breaking Bad*, respectively.

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The results on Table 3 shows that the method we use, CFF frames of VGG 16 and Kmeans clustering, performs better than Bost (2016). We have also compared our method with C99[6] by Choi (2000), one of the famous segmentation techniques, and still our method performs better.

TABLE 3. COMPARISON OF RESULT OF SCENE SEGMENTATION BETWEEN BOST (2016) AND OUR METHOD ON THE SAME DATA

	Bost (2016)			**Our Method**		
Game of Thrones	Recall	Precision	F1	Recall	Precision	F1
S01E01	0.47	0.20	0.28	0.41	0.30	0.35
S01E02	0.64	0.23	0.34	0.59	0.34	0.43
S01E03	0.72	0.27	0.39	0.73	0.32	0.45
Breaking Bad	Recall	Precision	F1	Recall	Precision	F1
S01E01	0.76	0.24	0.36	0.53	0.37	0.44
S01E02	0.56	0.14	0.22	0.53	0.29	0.38
S01E03	0.55	0.01	0.17	0.50	0.15	0.25

We compare all the features and their impact on the segmentation of a video into scenes. Table 4 compares the results of different features using the Kmeans clustering method, which show consistently good results for most of the features. CFF is the central frame features of a shot, STE is the text embedding of the shot and t is the timing of the shot in the video. The "VGG-CFF_Rank" are the features after ranking has been performed on the similarity matrix of the central frame features of the shot extracted from VGG16 deep pretrained model and we use VGG16-places365[7] features in our experiments. We also investigate the results of our method with and without augmentation with the temporal information. Table 4 shows the results using the features.

The method performs a little bit better in *Breaking Bad*, though we have used more data for *Game of Thrones*. In *Breaking Bad*, the combination of CFF and STF increases the results but the augmentation of temporal information did not show any significant improvement. In *Game of Thrones*, the combination of CFF, STF and temporal information (t) gives the best result. However, CFF alone performs better than combined with textual features. This can be explained by the fact that in *Game of Thrones* many shots do not contain any speech and are therefore associated with 0 subtitles and 0 STF values[8].

Similarly to C99 (Choi, 2000), we compute the rank of the similarity matrices. Ranking seems to improve the coverage in *Game of Thrones* and coverage and purity in *Breaking Bad*. But it does not improve the other measures.

TABLE 4. RESULTS USING DIFFERENT FEATURES AND THEIR COMBINATIONS BASED ON SPECTRAL CLUSTERING

Game of Thrones

Features	WinDiff	Pk	Coverage	Purity	Recall	Precision	F1
VGG-CFF	**0.03**	**0.01**	0.57	**0.86**	**0.59**	0.44	0.50
VGG-CFF_Rank	0.03	0.01	0.60	0.86	0.55	0.41	0.47
VGG-CFF $\oplus$ STE	0.03	0.01	**0.64**	0.84	0.52	0.44	0.48
VGG-CFF_ Rank $\oplus$ STE	0.03	0.01	0.63	0.85	0.45	0.37	0.40
VGG-CFF $\oplus$ STE $\oplus$ t	0.03	0.01	0.61	0.86	0.55	**0.47**	**0.51**
VGG-CFF_ Rank $\oplus$ STE $\oplus$ t	0.03	0.01	0.63	0.85	0.52	0.43	0.47

Breaking Bad

Features	WinDiff	Pk	Coverage	Purity	Recall	Precision	F1
VGG-CFF	**0.05**	**0.03**	0.6	0.79	0.57	0.49	0.54
VGG-CFF_Rank	0.05	0.03	**0.64**	**0.81**	0.51	0.46	0.48
VGG-CFF $\oplus$ STE	0.05	0.03	0.63	0.80	**0.61**	**0.53**	**0.57**
VGG-CFF_ Rank $\oplus$ STE	0.05	0.03	0.63	0.79	0.54	0.47	0.50
VGG-CFF $\oplus$ STE $\oplus$ t	0.05	0.03	0.64	0.79	0.59	0.52	0.55
VGG-CFF_ Rank $\oplus$ STE $\oplus$ t	0.05	0.03	0.63	0.80	0.44	0.40	0.41

5. CONCLUSIONS

Using the multimodal features of an episode from a TV series, we have designed a method for automatic scene segmentation. Our method shows detecting the shots and using shot

6 C99 generates highly over segmented results, which make the recall very high and the precision very low and, in consequence, a very low F1 measure. The average recall and precision computed using C99 are 0.13 and 0.05 respectively and the F1 measure is 0.08 for season 01 episode 01 of *Game of Thrones*.

7 Features extracted using VGG16-places have quite similar results with VGG16 features which are reported on Table 4.

8 The percentage of shots without subtitles in the test data is equal to 57% in *Breaking Bad* and 66% in *Game of Thrones*.

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level features are helpful for this purpose. In this work we have used shot visual features (SVF) and shot textual embedding (STE), which are both deep features. Since our method is based on shots, and the shots are based on visual features, the SVF performs better when used alone or in combination of other modalities.

We have tried to show the quality of our work using different metrics discussed in Section 4.3. Our method shows a good WindowDiff and Pk which shows the segmentation performs well. It also shows good purity values which can be interpreted as the grouping of shots into a scene is quite pure.

These preliminary results leave space for improvement. The textual features can be represented in a way comfortable for segmentation and in more suitable ways rather than just shot-based textual embeddings. Second, we believe that including audio features like music or prosodic information can improve the segmentation of a video into scenes. Speaker diarization can divide the audio of the video into segments according to the character's identity in a scene. Thus results from speaker diarization may also help improve the results of the scene segmentation by including each character in the sequence.

Scene segmentation is a fundamental task for many jobs that try to analyse and understand a video. In the near future, we plan to use our scene segmentation method for creating a meaningful link between scenes of the same episode and with scenes of other episodes of the same TV series. The link created between scenes will help to extract the parallel and intertwined stories of a TV series. There are different kinds of relationships between scenes that try to convey a message or tell a story to the audience. Our method is good enough to be used as scene segmentation whenever we want to do some scene-based analysis of a video.

In our future work we will be dealing with the extraction and the description of the narrative structure from TV series. The scene linking that will be created using our segmentation method will be helpful to understand the main theme of a scene and then can lead us to extract and describe the narrative structure of TV series. In the case of TV series, the narrative elements follow the same sequence in almost all series. Most episodes have a similar structure and each narrative element is located within a scene. A scene can have one or more of the basic acts of a narrative structure which will capture the important elements of narratives in TV series.

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DIALOGUE

"ALL IS CHANGING": INTERVIEW WITH JOACHIM KOSACK ON *DEUTSCHLAND83* AND TRANSFORMATIONS OF THE GERMAN TV SERIES INDUSTRY

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Since 2018, Joachim Kosack has been one of the Managing Directors of the UFA Group, which includes UFA Show & Factual as well as UFA Fiction and UFA Serial Drama, both central production companies for television series and films in Germany. Kosack worked as managing director and as a producer in both production houses. Together with Markus Brunnemann, he continues to run UFA Serial Drama, which specialises in daily soaps (now officially titled "Daily Drama"). Since 2005, he has also led the Series Producing / Series Dramaturgy department at the Ludwigsburg Film Academy. From 2007 to 2011, he was chief editor of original fiction for Sat.1, one of the biggest commercial, advertiser-funded broadcasters in Germany, and eventually became the channel's managing director. From 1996, Kosack was already working as head writer, director and producer at several UFA production companies, like teamWorx, which has since become part of UFA Fiction. teamWorx was particularly well-known for its historical event mini-series, like the two-part drama *Die Flucht* (*March of Millions*, 2007, ARD), produced by Kosack. They discussed National Socialism in the setting of a "historical-political melodrama" (Dörner 2008, see also Cooke 2016) and have been repeatedly criticised for this approach (see e.g. Ebbrecht-Hartmann 2011, Saryusz-Wolska and Piorun 2014). These period dramas by teamWorx became widespread outside of the German-speaking television market, too. The recent UFA production *Deutschland83* (2015-, RTL/Amazon Prime) carries on this tradition, but also moves away from it in a way, with its 80's setting, popular culture references, and lighter tone. With its popularity in English-speaking countries and some similarities to US series in terms of production methods, the show marks an increasing transnationalisation of TV series production in Germany. This interview discusses this particular example, as well as German television fiction in general, and the current changes regarding texts and production methods both in and outside of UFA.

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ISSN 2421-454X

I *Mr Kosack, how did you end up working in TV series production?*

K In the mid-1990s I chose to stop working in theatre and made the move to television. At the time, the market was booming in a similar way to today, but not with something that you would now call "quality series", but with daily series. People that were already established in the television industry didn't want to produce such series at that time. That's why lots of new people like me, from the theatre, from journalism, etc., were "flushed out" into this area. I spent the first five years of my television career working on industrial series like *Gute Zeiten, schlechte Zeiten* [*English: Good Times, Bad Times, 1992-, RTL, the longest-running and most popular daily soap in Germany]* or *Hinter Gittern – Der Frauenknast* [*English: Behind bars – The Women's Prison, 1997-2007, RTL, a weekly soap opera about a women's prison*]. And I then went on to work in various roles on local series like *Danni Lowinski* [*2010-2014, a legal dramedy for Sat.1*], and on high-end projects.

I *You've just mentioned some terms: industrial and local series and high-end series. How do these fields of German TV series production differ from one another?*

K Industrial series are especially "Daily Drama" productions, which have 250 episodes a year. However, this category also includes "Weeklies", which consist of 26 episodes, or in some cases 50 episodes a year which are broadcast each week. The method of production in this field features a systemised division of labour. Large parts of the team, including the writers and supervising or executive producers, heads of production, etc., only work on this series. Local series that have fixed prime time broadcasting slots, mainly in the prime time, are less industrialised in terms of their production methods as they usually only consist of ten to thirteen episodes, but they are clearly geared towards having several seasons. The budget for each episode is between 500,000 and 750,000 euros. The costs are even higher and the number of episodes is usually lower with high-end productions. These series have developed from the traditions of the so-called "event films". Through streaming platforms and pay TV, there are now more customers in this area. See *Deutschland86* for example, the follow-up to *Deutschland83*, which is produced for Amazon Prime Video, or, if you look outside of UFA, *Babylon Berlin [2017-, a historical series from Sky Deutschland and ARD]* and *4 Blocks [2017-, a mafia-drama series about Lebanese gangsters in Berlin Neukölln produced for the pay TV broadcaster TNT Serie]*. Corresponding high-end programmes differ from traditionally broadcast series in terms of plannability and regularity, and the creative development process is completely different.

I *How exactly do high-end series differ from local series in terms of plannability and development?*

K Local series are produced season by season and so with a certain degree of regularity. This allows [the producer] to make more precise financial calculations which isn't possible with a show like *Deutschland83*, for example, as it wasn't certain that it would lead to *Deutschland86* afterwards. With local series, the aim is to keep it on the [*German-speaking*] market for as long as possible, to continue to develop and evolve it, but also to ensure that it has some stability. With high-end segments, that are more substance-focused and less broadcasting-spot-dependent, innovation is central and there is less pressure on developing a very long-running format as a project is often completed after two or three seasons. This means that there is also a higher risk for the producer. In order to minimise this risk, the mixed calculation of the stability and innovation of large and small projects is central for UFA.

I *Is series production at UFA clearly divided according to the three types of series that you have just mentioned?*

K Until few months ago, Markus Brunnemann and I were joint Managing Directors of UFA Fiction. We are still working at this position at UFA Serial Drama, which specialises in industrial series. At both companies we structured the fictional productions into so-called "divisions" which go beyond the three previously mentioned main areas: One group deals with Daily Drama programmes for the daytime and access prime time, another deals with the long-term production of local series and sitcoms and another with "Reihen" *[90 minute long loosely-connected television films, often in the crime genre; these programmes are a series and TV film hybrid and are a particular feature of German public-service television fiction]*. A new label within UFA Fiction has also been created for new films and series. It's named after Freder Fredersen, the protagonist from Fritz Lang's *Metropolis* (1927). Then there is also another group that deals with high-end drama and cinema. These two have been combined due to the similarly high budgets, and the fact that the people involved in making the programme have to stay in close contact with the distribution partners to discuss and clarify whether funding may be needed. *[Film and media funding, which is primarily federally-structured in Germany, is increasingly opening up for series, particularly in the high-end segment.]* These divisions are looser groups that each have at least one or two manag-

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ing directors as strategic leads. We, the managing directors, regularly exchange ideas and opinions. It's not always the case that everyone can do everything, so it's crucial that we communicate with each other and see where there are overlaps.

I *Alongside these "loose groups", a subsidiary of UFA Fiction has also been created and is now under the leadership of Jörg Winger, the producer and creator of Deutschland83. Does this mean that there is a move away from centralisation in the UFA group and that the group is orienting itself more towards high-end series?*

K The consolidation of former subsidiaries into three central productions units – UFA Fiction, UFA Serial Drama and UFA Show & Factual, for non-fiction programmes, six years ago – was certainly important and it was definitely the right thing to do in order to bring the subsidiaries closer together. The downside to centralisations such as this is that they can often be a little confusing. Care must be taken to ensure that specific processes and energy flows are not brought into line and made equal, but instead that they keep their independent forces, just like Jörg Winger has kept his own personality in a very particular international series. His subsidiary should allow him to position himself differently in the market. That is somewhat of a balancing act for a large company like UFA, networking different areas and people on the one hand, while making sure that creative people who are more solitary and who want work alone, have sufficient space to do so, on the other. Incidentally, *Deutschland83* is a result of structures within UFA being torn down and different energies coming together in new combinations.

I *What new combinations was it exactly that led to the creation of Deutschland83?*

K In particular, unusual combinations of energies from long-standing, local series and high-end event television. Jörg Winger was a successful producer of *SOKO-Leipzig [2001-, ZDF]*, a primetime crime series broadcast by ZDF with the budget of an early evening production, and wanted to try his hand at producing something in another field. Nico Hofmann led teamWorx and had little to do with Jörg Winger. As teamWorx and other subsidiaries worked together producing fiction television shows, new discussions suddenly came about. It was also a question of timing: For example, Anna Winger, Jörg Winger's wife, who was also one of the masterminds behind *Deutschland83,* wrote numerous other scripts at the same time *[including a 90-minute episode of SOKO Leipzig]*. As the new head of RTL, Frank Hoffmann wanted to repeat the success of the ZDF mini-series *Unsere Mütter, unsere Väter [Generation War, 2013]*, in the belief that it made no difference where projects like this are broadcast.

I *In retrospect, would you agree with this assessment, that today it doesn't really matter where a series like Deutschland83 is broadcast?*

K No, I would not. This was exactly the problem with the RTL broadcast. [*After selling the programme to other countries and following positive reviews in the USA, the numbers that watched the first German broadcast on RTL was below expectations*.] Everyone knew that *Deutschland83* wasn't a perfect match for RTL's programming and regular viewers. The idea was to reach other viewers that wouldn't normally watch this channel. Unfortunately it didn't work in this particular case. But I suspect that the similar objective is rather successful with *Babylon Berlin* in the analysis by public-service ARD. [*Babylon Berlin was initially broadcast on Sky Deutschland and was then shown almost a year later on the public-service broadcaster ARD, where it was also available online for a limited period of time*.] Of course it really matters where a series is broadcast, at least with the private advertising-financed broadcasters. Their actual problem is that the number of regular viewers is continuously decreasing. Viewers simply don't expect to see high-end formats on regular broadcasting channels or they want to watch the episodes all in one go and without being interrupted by ad breaks. This is precisely why RTL is currently intensifying its online distribution with the platform *TV Now. [2019 TV Now released its first original production, the German-Austrian adaptation of the Fritz Lang classic M – Eine Stadt sucht einen Mörder, M – A City Hunts a Murderer; The Austrian public-service broadcaster ORF is the coproducer.]*

I *Deutschland83 was broadcast in other countries, including English-speaking countries. To what extent was the international distribution planned?*

K That *Deutschland83* would be broadcast as the first German series on a network in the US, namely the pay TV broadcaster Sundance TV, was not planned from the beginning. *Deutschland83* started almost four years ago, and since then, the market for TV series in Germany has changed significantly. During the development of the programme a greater interest in German TV series developed in foreign countries due to the success of the three-part event film *Generation War*, that could have actually also been broadcast as a series. As a result, distributing *Deutschland83* in other

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countries started to become more part of the strategy. With earlier event films and multi-part programmes, like *Dresden [2006, ZDF]*, global sales and distribution had already begun to play a significant role in the overall financing.

I *But are the often relatively small sums earned from overseas sales economically relevant*?

K It's an important part of the overall picture, even if the individual sums are perhaps not so large. It's these sales that we can then use as investments in new developments. There are currently new financing models that have arisen in connection with international distribution and which still need to be refined further. Classic providers, like public-service broadcasters, have a new openness for joining forces with platforms like Netflix, Amazon and Sky – see *Babylon Berlin*.

I *With mixed financing like this, there has been a clear move away from 100% financing from a broadcaster, as has mostly been the case in Germany for a long time. Has this also changed the role of production companies like UFA?*

K As a production company, we must invest in the high-end sector and put more money into script development. One may try to take this money from the production budget later. But that's not easy as the quality of the production is fundamentally the most important thing. This is currently the subject of a big discussion between producers in Germany, led by the producers' alliance [*Allianz Deutscher Produzenten – Film & Fernsehen, the largest alliance of German film and television producers*] with the question: How can producers make better investments so that they can benefit financially from the success of formats later on? The debate is about issues like rights shares, geo-blocking and so on. Right now, there is a *Kulturkampf*, a cultural battle regarding this, with the producers on one side and the broadcasters and platforms, including the established public-service and advertising-financed ones, on the other. They often tend towards the assumption that: "The productions are completely commissioned by us. Thus, ultimately they belong to us. It's us that bear the financial risk". I think that the producers, large and small, should be in a better position to invest more money in script development as broadcasters often do not do this themselves. [*Commissioning editors from broadcasters, with whom the author has carried out further interviews, paint a somewhat different picture of this issue.*] As such, it's really important that we get away from this "buy-out" way of thinking or just pure commissioned productions. The producers' alliance has negotiated the first models for this with public-service broadcasters [*like the key issues paper with the public-service broadcaster ARD, according to which an increasing number of part-financed productions, alongside purely commissioned productions, should be possible*].

I *To what extent is the move away from pure commissioned productions and revenue models relevant for authors too?*

K For an author it's less secure and usually also less lucrative to work on a concept for a new series for months or years, than writing a number of scripts for an ongoing local series like *SOKO [1978-, a German crime procedural with various local versions, ZDF]*. As a producer, I can only really win an author over by saying: If it's a hit, you get to be a part of it. This now changes their job description and value.

I *Scriptwriters in Germany are increasingly complaining about their supposedly bad position, like last year in the public pamphlet and voluntary commitment Kontrakt 18 [contract 18), in which they called, amongst other things, for the right to co-determine the director and to see and comment on rough cuts. Are writers' activities and their value now changing?*

K Traditionally, the power of the commissioning editors and the power of the directors in Germany has been very great, also because the key role of the single TV film that has often been associated with a particular director. But this is all changing because, amongst other things, streaming platforms have brought about a completely different view of script development. It's absolutely not true that the streaming platforms, as many people have claimed, barely exert influence on the script, but they have a more strategic view of the overall picture than individual editors. Writers and collaborative methods of screenwriting are becoming more important due to the current popularity of serial narration. In these cases, the writer, showrunner or creative producer is at least just as important as the director. For people working in the high-end segment and for younger authors, it's much more normal to work in a team. If you work on a crime series that has one case per episode then it is still more common for the writers to work alone, but even here more often they are in creative teams in one place. But every series with an ongoing dramatic continuity is nowadays developed in any way in a writers' room.

I *But in my impression a variety of fairly similar processes ultimately all are referred to with the term writers' room.*

K There you're completely right, "writers' room" is simply a generic term. There are some writers' rooms that have a

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central head writer and other members operating for him/her. Other teams all work together at the same level. In other cases, there is someone who has the role of a "Player-coach", to use a term from football, who structures and guides the work. In other writers' rooms there may be someone that gives out tasks or someone that also remains on set during the shooting. In UFA, there are various different writers' room approaches used, and we are still very much at the beginning. However, in terms of the division of labour for the Daily Drama production process, all story editors have worked on storylines together since the 1990s.

I *Another term that you used is one that has already been circulating in the German television industry for several years – the term showrunner. How would you summarise the role of showrunner from your point of view and with regards to the production of series in Germany?*

K As the centre of a creative vision. In a construction as big as the production of a TV series, the showrunner is the one that pulls all the different components together. As someone that gives and supervises ideas. The term is still quite vague in terms of meaning, particularly in Germany. The showrunner could be the head writer that is really involved in the production. Or the producer, who again heavily takes part in working on the story. That showrunner can sometimes consist of two people. I would generalise the role of the showrunner by asking: Who's *in the driving seat*? This can change, especially with projects that are developed over long periods of time. Although here at UFA, we believe that the person that came up with the original idea should be part of the process for as long as possible. Even if they get stuck with a project and it is then continued by other colleagues after a long time, the work that they did before was not for nothing. The further developments were only possible because of the work that had already been done. The original vision – whether it be fully-formed or just a rough initial idea – must already be in existence for this to happen. The visionary primordial cell has therefore to exist, in whatever intensity.

This interview was conducted as part of a series of surveys carried out for the research project *"Quality TV Series" as Discourse and Practice: Self-Theorizing in the German TV Series Industry"* commissioned by the *Deutschen Forschungsgemeinschaft* [German Research Foundation]. For a discussion about the initial results of the research, see, amongst others, Krauß, Florian (2018). "'Quality Series' and their Production Cultures: Transnational Discourses within the German Television Industry." *SERIES - International Journal of TV Serial Narratives* 4(2): 47-59. https://doi.org/10.6092/issn.2421-454X/8282.

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Deutschland 83/86 (2015-present)
Dresden (2006)
Die Flucht (*March of Millions*, 2007)
Gute Zeiten, schlechte Zeiten (English: *Good Times, Bad Times*, 1992-present)
Hinter Gittern – Der Frauenknast (*Behind bars – The Women's Prison*, 1997-2007)
M – Eine Stadt sucht einen Mörder (*M*, 1931)
M – Eine Stadt sucht einen Mörder (English: *M – A City Hunts a Murderer*, 2019)
Metropolis (1927)
SOKO (*SOKO 5113*/*SOKO München*, 1978-present)
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WHY EVERY SHOW NEEDS TO BE MORE LIKE *THE WIRE* ("NOT JUST THE FACTS, MA'AM")

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The Wire (HBO, 2002-2008) upends the traditional police procedural by moving past basic plot points and "twists" in the case, diving deep into the lives of both the cops and the criminals they pursue. It comments on today's America, employing characters who defy stereotype. In the words of creator David Simon:

> The grand theme here is nothing less than a national existentialism: It is a police story set amid the dysfunction and indifference of an urban department—one that has failed to come to terms with the permanent nature of urban drug culture, one in which thinking cops, and thinking street players, must make their way independent of simple explanations (Simon 2000: 2).

Given the current political climate in the US and internationally, it is timely to revisit the *The Wire* and how it expanded the cop-drama universe. It was a pioneering season-long procedural. Here are my top 10 reasons why Every Show Needs to Be More Like *The Wire.*

—

1. **"THIS AMERICA, MAN"**

As David Simon explains:

> In the first story arc, the episodes begin what would seem to be the straightforward, albeit protracted, pursuit of a violent drug crew that controls a high-rise housing project. But within a brief span of time, the officers who undertake the pursuit are forced to acknowledge truths about their department, their role, the drug war and the city as a whole. In the end, the cost to all sides begins to

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> suggest not so much the dogged police pursuit of the bad guys, but rather a Greek tragedy. At the end of 13 episodes, the reward for the viewer—who has been lured all this way by a well-constructed police show—is not the simple gratification of hearing handcuffs click. Instead, the conclusion is something that Euripides or O'Neill might recognize: an America, at every level at war with itself (Simon 2000: 3).

"Each wiretap ultimately proves as discomfiting to the authorities as it does to those targeted. This is world in which knowledge is always a double-edged sword" (Ganz 2016: 109-10). We see this immediately in the teaser of the pilot. Detective Jimmy McNulty (Dominic West) is at the scene of a shooting, questioning a Witness (Kamal Bostic-Smith) on the murder of a boy from "round the way" nicknamed "Snot Boogie". McNulty and the Witness go back and forth on the origin of "Snot Boogie's" nickname at first. Until the Witness explains what happened:

MCNULTY
So who shot Snot?

WITNESS
I ain't going to no court. Motherfucker ain't have to put no cap in him though.

MCNULTY
Definitely not.

WITNESS
He could've just whipped his ass, like we always whip his ass.

MCNULTY
I agree with you.

WITNESS
He gonna kill Snot. Snot been doing the same shit since I don't know how long. Kill a man over some bullshit. I'm saying, every Friday night in the alley behind the cut-rate, we rolling bones, you know? All the boys from around the way, we roll till late.

MCNULTY
Alley crap game, right?

WITNESS
And like every time, Snot, he'd fade a few shooters. Play it out till the pot's deep. Then he'd snatch and run.

MCNULTY
—Every time?

WITNESS
—Couldn't help hisself.

MCNULTY
Let me understand you. Every Friday night, you and your boys would shoot crap, right? And every Friday night, your pal Snotboogie he'd wait till there was cash on the ground, then grab the money and run away?--You let him do that?

WITNESS
—We catch him and beat his ass. But ain't nobody ever go past that.

MCNULTY
I gotta ask you. If every time Snotboogie would grab the money and run away why'd you even let him in the game?

WITNESS
What?

MCNULTY
If Snotboogie always stole the money, why'd you let him play?

WITNESS
Got to. This America, man.

We're not given any good cop, bad cop back and forth. There's no steel table with a single bulb dangling above it, no surprise evidence being slammed on the table (although *The Wire* is not opposed to that). Our first scene of the series shows McNulty questioning the Witness by understanding the culture of their environment and the connection between these boys, who play craps every Friday night. It also shows the criminal in a different light, sensitive and moral. You can beat up "Snot Boogie" for stealing the money, but shooting him isn't right.

The Wire exists in a post-9/11 and to some extent, a post-war-on-drugs world (it's unwinnable). No longer are large resources being spent on taking down drug dealers and inner

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city gangs. The money is funneled towards counter-terrorism. This is shown in an exchange between McNulty and his friend in the FBI, Special Agent Terrance 'Fitz' Fitzhugh (Doug Olear) in the Pilot.

[McNulty and Fitzhugh watch a live video of a stash house on Homer Ave.]

FITZHUGH
That's about $3,000 of raw on the table today. We followed it all the way from New York.

MCNULTY
You're up in New York on this?

FITZHUGH
We could be. We're backing into some Dominicans up there. We could have a Title III on them right now if we wanted.

McNulty gives Fitzhugh a confused look.

FITZHUGH
Wrong war, brother. Most of the squad's been transferred to counterterrorism. This thing's the last drug case we got pending and I gotta shut it down by the end of the month.

MCNULTY
You guys are getting out of drugs?

FITZHUGH
Yeah, for a while. We just don't have the manpower to stay on anything big. Not since those towers fell.

MCNULTY
What, we don't have enough love in our hearts for two wars? Joke's on us, huh?

FITZHUGH
I guess so. Still, you give great case, brother. I wish you could've worked it with us.

We have another example of the impact of the shift towards counter-terrorism in Season 1, Episode 3: "The Buy":

[Fitzhugh, McNulty, and Detective Kima Greggs (Sonja Sohn) watch the video of a stash house being busted.]

FITZHUGH
This little thing is the smile of the week. Watch this.

[Plays video of a FBI bust on a crack cocaine operation.]

FITZHUGH
Career case. Not that my boss would give a damn at this point.

GREGGS
Why not?

FITZHUGH
Why not?
[Jimmy and Fitz exchange a look.]

FITZHUGH
All of those mopes in bracelets, not one of the named Osama.

This America, man. *The Wire*'s sharp observations remain relevant today.

2. PLAYING AGAINST STEREOTYPES

As David Simon foresaw in his early series bible—

> Structurally, each season of *The Wire*—be it nine or thirteen episodes—exists as a standalone journey. Some characters may progress to the following season for continuity; most others will have their stories resolved in a single season (a design that allows for greater latitude in casting) [...] Nothing should happen on screen that hasn't in some fashion happened on the streets, and the show will utilize a series of veteran detectives and Baltimore street figures for story lines and technical assistance. As [HBO miniseries] *The Corner* is to every other inner city melodrama, so should *The Wire* be to any other presentation of police work (Simon 2000: 2-3).

The characters may simply be the vehicles through which we understand police work, the war on drugs and today's America, but none of them conform to stereotypes. Here's are some of the key figures from the course of the series:

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Omar Little (Michael K. Williams). It's ironic that the most fear and damage is wreaked upon our intimidating drug dealers by a gay, shotgun-toting stick-up boy. The added irony that even though everyone in Baltimore is trying to kill Omar Little, it's an eight-year old child who ends up succeeding.

Detective Shakima "Kima" Greggs (Sonya Sohn). Kima is a key player on the cop side of the investigations. Shown as the first other cop in the detail McNulty has any respect for as "natural poh-lice". Kima is black, female, and lesbian—making her an outsider in the entirely male and majority white Baltimore PD. While undercover as a stripper, Kima is shot towards the end of Season 1 ('The Cost', 1.10). This brings up the subject that black cops are more often sent undercover and thus put into more dangerous situations.

Felicia "Snoop" Pearson (Felicia Pearson). Tough, fearsome female gang lieutenant whose gender is rarely, if ever, mentioned or a point of discussion. (As opposed to Omar's homosexuality, which makes his success in robbing Avon Barksdale (Wood Harris) even tougher for Avon to swallow.)

Russell "Stringer" Bell (Idris Elba). Avon's second in command, who is constantly searching for a way to legitimize their business, taking night classes in economics. This type of "intelligent gangster" character has become more and more common post-*Wire*.

Brother Mouzone (Michael Potts). The deadly assassin sent from New York to protect Avon's interests—who also happens to be a stodgy, bookish brother of Islam.

It's also important to note the show's subtle treatment of race, which transcends stereotypes. As Professor Stephen Shapiro of University College Dublin explains:

> It is an unusual and ambitious urban crime show in the perspectives and layers it brings to characterization and plotting, and in the nuanced portrayal of race conflict, city politics, and the moralities of urban criminality and policing. It references many other urban crime narratives—literary, cinematic and televisual—yet develops its own distinctive sub-genre, the urban procedural, a fabrication of urban spatial relations that intercuts worlds usually unrelated in political and social studies never mind television cop shows. More consistently than any other crime show of its generation, *The Wire* challenges viewers' perceptions of the racialization of urban space and the media conventions which support this.
>
> It reminds us just how remarkably restricted the grammar of race is on American television and related media, and of the normative codings of race—as identity, as landscape—across urban narratives, from documentary to entertainment media. The typical mise-en-scene, of black kids dealing drugs on ghetto corners, is an everyday snapshot of the structural impoverishment and isolation of an underclass whose hypervisibility in other media frames (including gaming) is either manifestly exoticized and pathologized or only momentarily made visible through instances of spectacular disaster, like Katrina, rather than as a long-standing, structural presence (Shapiro 2012).

In today's America, shows such as *The Wire* are invaluable, as they have the ability to dissolve harmful stereotypes, fostering connection instead of divisiveness—and better understanding of one another. *Orange Is the New Black* (2013-) has had similar success in this regard.

3. THE SEASON-TO-SEASON PIVOT

Each season-long procedural faces the challenge of writing themselves out of a corner in new and surprising ways. The British cop drama *Broadchurch*, for example, pivots from murder-mystery in Season 1 to season-long trial in Season 2. Other shows pivot by introducing a new crime or central mystery and staying the course with the same cast, deepening and/or shifting focus to other characters, such as *The Leftovers*, Season 3. *The Wire* pioneered the season-to-season pivot, around five key themes and areas:

SEASON 1: **DRUGS**. The first season introduces two major groups of characters: the Baltimore Police Department and a drug-dealing organization, run by the Barksdale family. The investigation is triggered when detective Jimmy McNulty meets privately with Judge Daniel Phelan (Peter Gerety), following the acquittal of D'Angelo Barksdale (Lawrence Gilliard Jr.) for murder—after a key witness changes her story.

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SEASON 2: **PORTS**. The second season, along with its ongoing examination of the drug problem and its effect on the urban poor, examines the plight of the blue-collar, urban working class as exemplified by stevedores in the city port, as some of them get caught up in smuggling drugs and other contraband inside the shipping containers that pass through the port. In a season-long subplot, the Barksdale organization continues its drug trafficking despite Avon being imprisoned, with Stringer Bell assuming greater power.

SEASON 3: **POLITICS**. In the third season, the focus returns to the street and the Barksdale organization. The scope, however, is expanded to include the city's political scene. A new subplot is introduced to explore the potential positive effects of de facto "legalizing" the illegal drug trade, and incidentally prostitution, within the limited boundaries of a few uninhabited city blocks—referred to as Hamsterdam.

SEASON 4: **SCHOOLS**. The fourth season expands its scope again to include an examination of the school system. We enter this world through formerly loose-cannon cop turned code breaker, Roland "Prez" Pryzbylewski (Jim True-Frost), who is forced to resign after he accidentally shoots another cop. Prez begins teaching middle school math in inner-city Baltimore. Other major plots include the mayoral race that continues the political storyline begun in Season 3, and a closer look at Marlo Stanfield's (Jamie Hector) drug gang, which has grown to control most of western Baltimore's trafficking.

SEASON 5: **MEDIA**. The fifth season focuses on the media, and media consumption. The show features a fictional depiction of the newspaper *The Baltimore Sun*, and in fact elements of the plot are ripped-from-the-headlines events and people who work at the paper. The season deals with which stories get told, which don't and why it is that things stay the same. Issues such as the quest for profit, the decrease in the number of reporters and the end of aspiration for news quality are addressed, alongside the theme of homelessness.

4. PULLING BACK THE CURTAIN: JUGGLING PROFESSIONAL AND PERSONAL LIVES

Predecessors *Hill Street Blues* and *NYPD Blue* both cover work and home to some extent, but use the case-of-the-week structure, versus *The Wire*'s more narrow, slow-burn, deliberative season-long procedural approach—which lends itself best to streaming/binge-viewing.

Over the course of *The Wire,* we watch as our POV character Jimmy McNulty destroys his life, then rebuilds it, only to destroy it once again. In Season 4, McNulty is largely absent from the drama of the professional world. He's been sentenced to a walking beat in West Baltimore and has moved in with Beadie Russell (Amy Ryan) and her two boys. We are led to think the heavy-drinking, drug-busting Jimmy is gone. But it's not long until the lure of a rising drug gang, that appears to be taking over without dropping any bodies, pulls Jimmy from his charming, happy home life and back onto the corners of Baltimore.

5. SETTING AS CHARACTER

From the corners to the courthouse, from the docks and the schools to Hamsterdam, Baltimore is really the main character of *The Wire.* The connection the characters feel for their parts of the city, whether that be "the towers" or city hall, pushes much of the drama and conflict in the series. David Simon, who used to be a crime beat journalist in Baltimore, knows the city and its idiosyncrasies well:

> The city is poor, undereducated and struggling with a huge heroin and cocaine problem. There is a sense that much of the population is gone, fled to the suburbs. Vacant houses often seem to outnumber rowhomes in the worst parts of the city. Factories and warehouses stand empty [...] Winters are cold, summers hot. And despite all the problems inherent, there is a deep if peculiar affection for the city felt, though rarely expressed, by its residents. The past is always present here, unlike the new metropolises of the West. We are in a remnant of old America as it struggles to make itself into part of the new (Simon 2000: 5).

Bodie Broadus (J.D. Williams), who remains one of the last of the Barksdale crew left standing, dies as a result of refusing to back down from his corner during an assault ('Final Grades', 4.13). He's already seen the towers he grew up in demolished by corrupt politicians to make way for fancy developments; he won't be pushed off his corner as well.

Characters are hopelessly tied to their city and their circumstances, just like in real life. Stringer Bell cannot transi-

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tion from gang leader to businessman. His desire to move up gets him pushed out. Often a character's desire to stay in Baltimore leads to their demise; after informing on Stringer to the police, Wallace (Michael B. Jordan) is sent to the country to stay with his grandparents, where he'll be safe. However, Wallace has never been out of Baltimore City and grows restless with the country quiet. Even though he returns at his own peril, Wallace cannot stay away from the life he knows ('Cleaning Up', 1.12). This is even true away from the corners. At the end of Season 2, Nick Sobotka (Pablo Schreiber) enters the Witness Protection Program, but by the series finale, he has left the Program and reappears in Baltimore at the port ('The Dickensian Aspect', 5.06).

6. **TRUE GRIT AND AUTHENTICITY...**

The language and culture of *The Wire* are so authentic and unique to the city of Baltimore, they create a realistic and nuanced portrayal that transcends the usual "urban street" dramas. From the "pit beef sandwiches" and Omar's ominous "Aye Yo!" to the network of pagers, pay phones and whistles the corner boys use to move product, David Simon pulled from his background as a police journalist to build a true-to-life Baltimore in the show.

It's important to note that dialogue is not real speech. Meaning that, even in the most realistic, grounded, gritty series such as *The Wire*, where people do speak in ways that sound very natural and faithful to who they are as characters, the dialogue is still heightened. There's poetry in the words. The writers not only play around with how the more educated, erudite characters speak, but they also give disenfranchised characters a specific slang that's their own private language. Speaking to a class at UCLA recently, David Simon explained how the vernacular used among the "corner boys" was a by-product of his own years sitting out on a West Baltimore corner. He also said that he would not attempt to write *The Wire* set in today's Baltimore because the language on the streets, in his view, has changed completely.

...POETICS, SOLILOQUIES, ARIAS AND THAT SCENE OF ALL FUCKS

The Wire is often compared to Shakespeare. The poetic but straightforward nature that Simon and his team use to tell their story of a Baltimore drug war demonstrates that characters are given respect and intelligence, no matter what part they play in the system. The writing is perceptive, whether it's McNulty and his partner Detective William 'Bunk' Moreland (Wendell Pierce) discovering damning evidence in a scene entirely composed of variations of the word "fuck", or this scene in the pilot where Detectives Greggs, Ellis Carver (Seth Gilliam) and Thomas 'Herc' Hauk (Domenick Lombardozzi) discuss police bureaucracy and end up making a thoughtful point about the war on drugs. Their dialogue leaps from the page.

GREGGS
What's up?

LT. DANIELS
Deputy's throwing some kinda piss-fit.

GREGGS
Major know?

LT. DANIELS
He's up there now.

CARVER
With a mouthful of piss, probably.

HERC
Like our major don't know what that tastes like? It's the chain-of-command, baby, the shit always rolls downhill.

CARVER
Motherfucker, we talking about piss.

HERC
Piss does too, think about it.

CARVER
Shit rolls, piss trickles.

HERC
Downhill, though.

CARVER
You don't know that for sure--

GREGGS
Not to change the subject on you two
charmers but why are there only two ECU numbers?

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HERC
Dope and guns.

GREGGS
—Two guns, right? —That's three.

HERC
Fuck it, Kima. You want a job done right, you gotta do it your own self.

CARVER
He means that we are an effective deterrent on the war on drugs when we are on the street.

HERC
Fucking motherfuckers up, right?

CARVER
Indeed.

HERC
Fuck the paperwork.—Collect bodies, split heads.

CARVER
Split them wide.

HERC
The Western District way.

CARVER
All right.

GREGGS
You heroic motherfuckers kill me. Fighting the war on drugs one brutality case at a time.

CARVER
Girl, you can't even call this shit a war.

HERC
Why not?

CARVER
Wars end.

Some dialogue is written to feel naturalistic; the writers don't want to draw any attention to it. They want us to feel as if we're eavesdropping on realistic situations—such as in the infamous scene of "all fucks" from *The Wire*. As they keep using the word over and over again, it becomes almost like a game between the two detectives. And then they want the only words to be the f-bomb in the scene. So it starts with the writer's agenda; the audience then starts to realize, "Oh, wow, these are the only words that are being spoken in the scene". Then the detectives start to play off each other, and it becomes that game. It's a fun, interesting, unique way to show the relationship between the two detectives, to make it more than a typical, dry procedural that we've seen a million times. Since *The Wire* was an HBO show, the writers had the freedom to use the f-word. And this was fairly early in premium cable. A cable show is not limited by Standards and Practices, which controls what curse words can be said on a network. So it's possible to cut the characters loose and let them talk the way they really would. For good measure, here's the playful scene from episode 'Old Cases' (1.04):

[McNulty and Bunk arrive at an apartment building, to investigate the shooting of one of Avon's girlfriends.]

MCNULTY
Will you explain to me again why I'm about to rework a six-month-old crime scene?

BUNK
Look at this narrow-ass file.
Keeley didn't do shit on this.

MCNULTY
He did the scene, though.

BUNK
This is Keeley we're talking about.

MCNULTY
Fucking Jay and his leaps of logic. This case is nowhere near anything we're doing.

BUNK
So? Give it a shake or two anyhow.
—Make a sergeant happy.

MCNULTY
Whatever. Do you know Lester Freamon?

DOI https://doi.org/10.6092/issn.2421-454X/8703
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BUNK
A little. Why?

MCNULTY
He's with us on this Barksdale thing.

BUNK
I thought you said they gave you humps.

MCNULTY
He looks like a hump, he acts like a hump, sittin' there, playing with his toy furniture.

BUNK
Jimmy, he makes more money off of that shit than you do off of this job.
—Don't let Lester fool you.

MCNULTY
He did already. Today in roll call, he showed something.

BUNK
Hey, he's natural police. He used to be Homicide.

MCNULTY
—Why did he leave?

BUNK
—Ask him.

MCNULTY
—This is the one?

APARTMENT SUPER
—Yup. Hasn't been rented since.

Bunk and McNulty enter the apartment. Bunk looks at the crime scene photos.

BUNK
Ah. Fuck.

MCNULTY
Motherfucker.

Bunk lays out the crime scene photos on the kitchen floor.

BUNK
Fuck fuck. Fucking fuck. Fuck. Fuck. Fuck. Fuck.

McNulty examines the autopsy file.

MCNULTY
The fuck?

BUNK
Fuck.

A tape measure snaps back on McNulty's fingers.

MCNULTY
Fuck!

Bunk places a photo on the window. Circles the spot of the bullet hole. Jimmy stands in the middle of the kitchen trying to measure where the gun would have had to have been held to get the victim's entrance and exit wounds. It doesn't make sense.

BUNK
Fuck.

MCNULTY
Fuck it. Mother fuck.

Bunk looks back to the photo on the window and the bullet hole he's drawn.

BUNK
Mother fuck.

Bunk notices the glass is on the INSIDE of the window, not the outside. The shooter was outside.

MCNULTY
Ah, fuck. Ah fuck.

McNulty leans up to the window to test the theory. Yep.

MCNULTY
Fuckity fuck fuck.

BUNK
Fucker.

DOI https://doi.org/10.6092/issn.2421-454X/8703
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McNulty and Bunk begin to search for the bullet.

MCNULTY
Ah fuck.

BUNK
Fuck fuck fuck fuck fuck fuck.

In the crime scene photos they see some plastic debris by the body.

BUNK
Mother fucker.

McNulty finds a lump in the fridge door.

MCNULTY
Fuckin' A.

McNulty uses some pliers to pick at it.

MCNULTY
Fuuuuuuck.

They find the bullet.

MCNULTY
Mother fucker.

BUNK
Fuck me.

They line up the shot to see where the casing would have landed. They step outside to find it. McNulty taps on the glass as if recreating the shot.

MCNULTY
Pow.

Bunk measures from McNulty's gun to find the casing. They dig in the grass. There it is!

7. THE ON-SCREEN LINE OF DIALOGUE IN EPIGRAPH AS FORESHADOWING

Each episode opens with a meaningful line that's going to occur in the episode, and part of the fun is figuring out how it's going to tie into the story. In 'Alliances' (4.05), the line of dialogue was:

"If you with us, you with us".
—Chris Partlow

Foreshadows: The various factions and alliances built within the episode and the show. Tommy Carcetti's (Aiden Gillen) political connections, as well as Chris Partlow's (Gbenga Akinnagbe) efforts to recruit Michael Lee (Tristan Wilds) into the Stanfield organization. It's really driven home by the later episode when Partlow helps Michael kill his abusive father.

'Mission Accomplished' (4.13):

"...We fight on that lie".
—Slim Charles

Foreshadows: The success of McNulty closing the Avon Barksdale case, as well as Brother Mouzone and Omar's success of finally killing Stringer Bell. David Simon also noted that Season 3 was supposed to be symbolic of the Iraq War.

Thoughtful epigraphs add to the poetry and genius of the show.

8. ANYONE CAN DIE ANY TIME

Viewers have become more sophisticated over time; the intelligent TV viewer knows that characters can die in the penultimate episode or season finale. But early on, *The Wire* set up the expectation that any character could die at any time (a precursor to that other famous HBO show). Though he was one of our main POV characters for the Barksdale organization in Season 1, D'Angelo "D" Barksdale is unceremoniously killed midway through the second season ('All Prologue', 2.06).

The same could be said for the almost unkillable Omar Little, who fans were sure would stick around until the series finale, but is shot down while buying cereal by a young corner boy ('Clarifications', 5.08). *The Wire* never fails to surprise.

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9. **BREAKING DOWN BARRIERS**

The Wire interweaves a myriad of social problems into compelling storylines. The show succeeds in capturing a snapshot of life, which is complicated and messy. It takes the time—the slow burn—over episodes and seasons to break down the challenges for the urban poor. The success of the social/story approach has resulted in esteemed sociologists William Julius Wilson and Anmal Chaddha teaching *The Wire* at Harvard University:

> Our undergraduate students will read rigorous academic studies of the urban job market, education and the drug war. But the HBO series does what these texts can't. More than simply telling a gripping story, *The Wire* shows how the deep inequality in inner-city America results from the web of lost jobs, bad schools, drugs, imprisonment, and how the situation feeds on itself.
>
> Those kinds of connections are very difficult to illustrate in academic works. Though scholars know that deindustrialization, crime and prison, and the education system are deeply intertwined, they must often give focused attention to just one subject in relative isolation, at the expense of others. With the freedom of artistic expression, *The Wire* can be more creative. It can weave together the range of forces that shape the lives of the urban poor.
>
> These storylines draw students into important academic research, such as sociologist Bruce Western's book *Punishment and Inequality in America*. His analysis shows that widespread incarceration of the urban poor aggravates economic inequality, masking the hardship in urban communities and producing a growing population of ex-convicts unable to find stable jobs to support their families (Chadda and Wilson 2010).

The show has broken down barriers in story and its approach to addressing complex social issues. Creator David Simon even won a MacArthur fellowship—a "genius grant" that is normally intended for pioneering scientists and social scientists. *The Wire* "was an opportunity to tell stories about where we are as a society using narrative fiction to make some of the arguments we would have made with journalism", he said.

10. **GRAY AREAS—AND NO EASY ANSWERS**

The Wire gives plenty of characters the "choice between two wrongs", but a father's decision to help his son by informing on some very dangerous people is at the top of the list. In 'Bad Dreams' (2.11), after Ziggy Sobotka (James Ransone) shoots and kills an associate of The Greeks, he faces life in prison. His father Frank (Chris Bauer) feels immense guilt over pulling his son and his nephew Nick into this high risk life of crime. Frank approaches the FBI about informing on The Greeks in exchange for a softer sentence for Ziggy. This choice leaves Frank dead and the FBI no closer to catching The Greeks.

As Harvard's Wilson and Chaddha point out:

> *The Wire* is fiction, but it forces us to confront social realities more effectively than any other media production in the era of so-called reality TV. It does not tie things up neatly; as in real life, the problems remain unsolved, and the cycle repeats itself as disadvantages become more deeply entrenched. Outside the world of television drama, sociologists aim to explain what causes certain social conditions and then assess the merits of competing theories. The solutions, however, are usually less clear. *The Wire* gets that part right, too.

Trying to steer the young Dukie away from the crime and drug trade in his neighborhood, former gang member Cutty tells him that the "world is bigger than that". With a tinge of hope that his life might be different, Dukie asks, "How do you get from here to the rest of the world?" The response: "I wish I knew" (Chadda and Wilson, 2010)

Consistently brilliant during its run and standing the test of time over a decade since the series finale, *The Wire* will continue to be the benchmark to meet, or better, for generations to come.

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