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ABSTRACT

Even if differences between narrative structures in serialized visual narrative and other type of visual or literary media have been widely acknowledged by academia, current quantitative analysis of the specific case of TV series still relies either on instance counting or on general narrative frameworks of analysis. In this paper we try to address this maladjustment by building an interaction-based model tailored for the complexity of these narratives. To test its possibilities,

we coded the first three seasons of HBO series *Game of Thrones* and constructed a numerical indicator that could be used for character analysis beyond traditional methods of interpretation. The results show high correspondence with a traditional textual analysis of the characters, even if the model did not take any dialogue to assess the content.

Keywords: *quantitative analysis, television series, analysis model, interactions, correspondence.*

R E S U M E N

A pesar de que las diferencias entre las estructuras de la narrativa visual serializada y otro tipo de medios visuales o literarios han sido ampliamente reconocidas por la academia, el análisis cuantitativo actual del caso específico de las series de televisión aún se basa en contar instancias o en marcos generales de análisis narrativo. En este artículo intentamos reparar este desajuste mediante la construcción de un modelo basado en las interacciones entre personajes, adaptado a la complejidad de este tipo de narraciones. Para probar sus posibilidades, codificamos las tres primeras temporadas de HBO Game of Thrones y construimos un indicador numérico que puede usarse para el análisis de los personajes más allá de los métodos tradicionales de interpretación. Los resultados muestran una alta correspondencia con un análisis textual tradicional de los personajes, incluso si el modelo no tomó ningún diálogo para evaluar el contenido.

Palabras clave: *análisis cuantitativo, series de televisión, modelo de análisis, interacciones, correspondencia.*

INTRODUCTION

Analysis of serialized visual narrative is still in development (Buonanno, 2019). As recent scholarship has pointed out (Brembilla, et al., 2018; Casoli, 2019) there are many features of serialized visual narrative that are distinctive because of its "high-complexity" and use of time as the main structural device (Mittell, 2015).

In the case of TV series, building new frameworks becomes highly relevant due to the prominent place that the age of streaming has given to such type of media (Tefertiller & Sheehan, 2019). That necessity goes beyond scholarly enquires and can affect production houses and business decisions as well (Braga, 2019). Despite of this, and even if all such narrative differences have been acknowledged when they are compared to traditional "dramaturgical *poetics*" (Mittell, *idem*), in the case of quantitative analysis of serial narratives, the scholarly work either focuses on "instance counting" regardless of narrative (Harris & Willoughby, 2009; Gregori-Signes, 2017) or still relies on what we will call "classic" narrative analysis models to frame the obtained data (Lieberman et al.; Collantes et al., 2011)

A poignant example of the latter case is Beveridge & Chemers recent work on HBO's Game of Thrones (2018), where Beveridge, a mathematician, partnered up with Chemers, a dramaturge, to analyze HBO Game of Thrones character progression through a Network Analysis method. Network Analysis makes it viable to measure characters "agency" (number of actions) and "prestige" (number of mentions or interactions aimed at the character) and its "centrality" (total number of interactions and mentions). The authors then determined the progression of "character arcs" as a tracking on the increase or decrease of these three

indicators. The analysis is useful in such complex narratives as Game of Thrones where, as the authors mention, there is an occurrence of what Showrunner Mike Carrey calls the "fractal protagonist", meaning a protagonist that occupies that role only relatively to what is being shown within the larger context of the complex narrative. Beveridge & Chemers successfully identify the diversity of trajectories and progressions in the most prominent characters through this method, however, the end conclusion surprisingly falls back to classic concepts like "hero's journey" or "tragedy" as the ultimate descriptors of such trajectories or "arcs". This does not pass the author's notice when they point out that some characters escape such descriptions; this is relevant because if such "arcs" do fall from traditional frameworks, then how are we supposed to analyze them?

In this sense, the research question arises: do character "arcs" that escape classification because of the high-complexity and extension of the narrative also escape the possibility of analysis? In this paper we argue that classic models of narrative analysis when taken as a panacea for revealing the intricacies of a character relay too heavily either on psychological or on structuralist frameworks. We will briefly explain what we mean by this and present a landscape on both models and its constraints. As a counter proposal we will introduce a new model tailored for serialized complex visual narrative that like Beveridge & Chemers quantifies the narrative *interaction per interaction*, but unlike Beveridge & Chemers uses a scale of measurement that should track first and foremost the bonding between characters and the way such bonding progresses in time (within the coordinates of strengthens & weakens, positively & negatively). Measuring character interactions within this scale, we have constructed a specific coefficient that can serve as a proxy for the way a character relates to other characters. Such proxy intends to be a stepping-stone for "tracking" a character's unique trajectories regardless of their "fitting" within a "prototypical arc" (heroic, villainous, tragic, redemptive etc.) (Smith, 2006; Veale, 2014)

To test for de adequacy of the model, we have coded the first three seasons of Game of Thrones with it and constructed a mathematical formula to get a construct we called "relationship strength". We then calculated the relationship strength for fifteen Game of Thrones characters and analyzed nine in dept. The results show high correspondence with an intuitive audience reception based on analysis of the series, even if the model did not take narrative content (dialogue) to assess such "bonds". This marks a way forward for future refining and applications of this method to track complex narrative.

THEORETICAL FRAMEWORK

Reception as complex process: the psychological character analysis model

The psychological character analysis model is an apparently straightforward approach (Krakowiak, 2013; Eden, 2015; Grizzard et. al., 2017; Kleemans et al., 2017), especially if we consider the broad sociocultural influence of theories on the role of the unconscious in the actions and personality of the subjects (real or fictitious), and how the theories proposed by Sigmund Freud became part of social discourse throughout the 20th century, both in colloquial language and in the systematization of fictional narrative. (Doyle, 1998)

The mention of "character psychology" is common in multiple models for character and narrative creation. For example, according to Gudiño for "understanding" characters: "there are four basic dimensions in their design and construction: the external, the internal, the diachronic and the synchronic. The writer or scriptwriter must interlace them" (2019). However, while the creator of the characters may find it useful to consider an "interior" life with motivations, complexes, and internal conflicts for her characters, the work subsists based on what *is being expressed*, regardless of the elements used (Galán, 2006, 2007). Although trans-media can bring extra-narrative elements into play and deliver them to the recipient[1], the axis of reception and the major source of acquisition and creation of meaning by the receivers continues to be the creative work itself. (Rojas, 2019)

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1   As is the very documented case of Johanna K. Rowling, who through the Pottermore website expands the information regarding the fictional universe where the saga of her character occurs Harry Potter.

However, there is an essential diachronic difference between creation and reception, since these occur at different times and have asymmetric levels of information; within the development, production and broadcast of audiovisual narratives this gets even more stressed. (Sundet, 2016; 2017)

There is a first moment: the creative process from which the conceptualization and development of the script begins, where psychological tools can establish the character's internal structure, actions and motivations. From this first product, a team will determine the production values, make a cast selection to bring the characters to life, and choose one or more directors to execute the action. (Blakey, 2017; Cascajosa-Virino, 2018)

It is at this point that another layer of information appears: the one established at the time of bringing the character to life. This will be a joint work of the actor or actress, based on the script, and the indications of the responsible director or directors. Here they unite the explicit elements of the previous creative work, with elements contributed by both the director and the person who executes the character (Bandelj, 2003). The performer can even resort to elements of his own life, personality or memories and add them to his tools for playing the character.

Finally, there is the editing and post-production process, which gives a final structure and rhythm to the audiovisual product. Other elements such as sound and music are added, which also generate an emotional impact on the narrative. (Seidman, 1981; Mann, 2008)

It is this complex product viewers will receive (be they only viewers or analysts and critics). From this "final product", audiences interpret the meaning, using for such interpretation both their contextual tools and the cues the material provides them. (Gorton, 2009) This implies that, at the reception level, the final audiovisual product is self-supporting, and interpreted without the full knowledge of the previous layers.

What this process entails is that in trying to analyze a character through the psychological tools perceived in the reception, the analyst assumes an "inner life" (Mead, 1990) of an entity that is *pure externality*, meaning, the analyst conducts an ontological reading (Sainsbury, 2009) without an object: the character only exists as long as he is in front of the receiver, it disappears as soon as it leaves the focus of the narrative and its motives exist so far as they are exposed. The finished character cannot have an essence or interiority since it only "is" at the time and place in which it appears.

Although at the narrative level the character functions as a metaphor for a person (*idem*), using this personalist perspective at a theoretical level thus frequently presents the difficulty of "stabilizing" the analysis: determining the elements that configure the character and establishing its relevance in the narrative universe. It is almost thus inevitable that characters end up being defined and described by factors that are not in the narrative but outside of it, generating great variability that results in myriad different interpretations depending on frames of reference, interactions with other elements of foreign fields, the analyst's own views on the subject, biases (Livingstone, 2013), and so on.

Finally, in recent times, another paradigm has been proposed to analyze characters and their actions — the concept of agency. Within the universe of narrative building and analysis, "agency" is broadly defined as the ability (of a character) to exert control over an outcome. (Dillman, et al., 2015) This approach is usually taken from the universe of psychology, where it's understood as a measure of the ability a person has to act efficiently and reach for personal objectives (Kartyas, 2016).

When talking about interactive narratives, the concept of agency is built around the possibilities that the narrative gives to the *person* selecting options and possible outcomes streaming from there — thus extending this perspective to the relative control that the author "gives" to a character (versus it being just a "narrative device"). However, as previously discussed for psychological approaches, using "agency" as an analytic tool for characters outside interactive narratives implies an "essence" or inner life that the character cannot possess outside of its actions.

Broad strokes: Structuralist models for narrative analysis

Structuralism is the process of the construction of categories that helps us make sense of reality.

(Hawkes, 2003; Dreyfus, et. al., 2014) The models of analysis derived from structuralism, therefore, tend to mark categorizations that can be used to determine the relevance and belonging of an element within a structure greater than itself. One of the main aims of this discipline in the field of literary criticism (which would later be extended to the universe of criticism of audiovisual works) was to generate a potentially more "stable" analysis (Grodal, 1999; Newman, 2006), with clear and limited criteria, which depended specifically on the narrative. A very successful example used in the narrative analysis of audiovisual products is the "monomyth", also known as "the hero's journey", studied by Joseph Campbell, and which has given rise to numerous structural analyzes of adventure or conquering narratives (Vogler, 2017).

Within the universe of structural proposals, there is also narratology (Bal, et al., 2009), understood as the semiotic specialty aimed toward analysis of structural elements in narratives (Bignell, 2002), whose relationship generates elements of meaning. The theoretical proposal of this discipline maintains a focus on action as the essential element for a narrative to occur and, therefore, analysis takes place in terms of the relationships generated when those actions are executed.

One of the most interesting effects derived from this intention is that the character stops being the axis of analysis: the story does not happen based on his motivations, desires or troubles (Grodal, 1999), but is a succession of actions, which interconnect with each other and are the true objects of analysis.

In this model, the characters are structures that are relevant much more as "actants" (Budniakiewicz, 1992), understanding them as a story function rather than an abstract aspect of discourse. Actions are analyzed from the structural axes that are set in motion from the relationships of said actants according to the directionality established by the axis of the action.

However, this "action" is also modified according to the multiple possibilities of the creative work, so using Greimasian directions (*Idem*) generates the need to redesign the terms in each analysis process, and although this allows a certain level of comparability between works (the parallels between "The Lion King" and "Hamlet", for example, which are evident in the actant analysis [Gavin, 1996]), it also constrains narratology to analysis of singular cases (it would not facilitate, comparing "Pocahontas" with "The Lion King"). These efforts tend to feed complex systems of relative correlations, which can hardly be compared to each other, or quantified and modeled, so there are few ways to operationalize them, limiting their uses and keeping them in qualitative analysis.

Summarizing: a way forward

Psychological models as described rely heavily on factors outside of the object of study; structuralist models compensate for this, with the disadvantage of over-focusing in case by case analysis. When applied in a generalized way, they describe narrative structures in far too broad strokes (as in the monomyth case), disabling thus the possibility for analyzing the intricacies of a complex narrative structure in terms that could both capture its singularities but still enable generalizations.

In this sense, Network Analysis for fiction (Bost, et, al., 2016) presents itself as a viable alternative for complex narrative analysis. However, as we have argued in the introduction, such analysis is in need for a coding model that can properly portray the semantics of narrative with reliance in frameworks that were not designed for this analysis to begin with.

The model we propose attempts to achieve exactly this. The axis of our analysis will be not the character itself (in any of its terms: neither psychologically, nor as an actant), but the actions-between-characters (interactions) and the manner in which that progression builds in a bottom-up way what we usually know as plot. Where traditional models consider the character as an accumulation of psychological elements (motivations, intentions, desires) or the plot as a pre-defined element that is fulfilled, the present model opens up to the possibility of analyzing what the narrative builds by itself, without taking for granted pre-existing elements outside the received work.

METHODOLOGY

Taking as a starting point Beveridge & Chemers (*Ibid*) interaction-based quantification we constructed a new scale to track each interaction between characters. The new scale considers two aspects that were unnecessary for a Network type of analysis of a television series, but that definitely are important if the measuring is to be complementary to psychological and/or structuralist methods of narrative analysis.

The first aspect we consider is *interaction intensity*. There are several ways to track this, but to make the interaction coding homogeneous and easily recognizable by any coder we opted for a model that would scale in the most unambiguous terms possible. Therefore, each degree in the scale need to be "crisp", meaning qualitatively different, and still each degree in the scale needed to indicate an increase in the intensity of the interactions.

The second aspect we consider is *interaction polarity*. Meaning that each degree defined needed to be expressed in its positive and negative aspect. After an organized, iterative process of defining and discussing several gradual categories of interactions, we inductively converged on the following model (**Table 1**):

Table 1: Interaction Scale

-5	Kills
-4	Permanently wounds, rapes
-3	Hits
-2	Avoids, threatens
-1	Says something opposing to, against
0	Looks at
1	Says something to
2	Does something with, gives something to
3	Is physically affectionate
4	Has sexual intercourse with, saves life of
5	Marries, vows to

In order to test for the appropriateness of the model first and foremost in its capacity to 1) properly code every interaction possible and 2) be sufficiently homogeneous by any coder regardless of personal opinion, we coded the first three seasons of HBO Game of Thrones. To begin with, one author of the model coded the first fifteen episodes, then trained a second coder (**See Approach**) to independently code the same sample. The coders agreed on 67 instances and disagreed on 8 (**See Approach**), giving of a Cohen kappa value of .78 which according to Landis & Koch (1977) entails to substantial agreement. Coder 2 coded 15 more episodes. None of the coders sensed there was any interaction being "left out" of the scale proveided. **Table 2** shows the proportions in which the interactions for the 30 episodes coded by Coder 2 fell according to the model.

Table 2: Number of total interactions of each type in Game of Thrones first three seasons

-5	126
-4	28
-3	237
-2	459
-1	1,595
0	384
1	3,503
2	974
3	194
4	78
5	8

It is noticeable that in the case of Game of Thrones the interactions form almost a bell curb in their distribution, except when they fall in the value of -5 which accounts for killings. It is also to notice that

even if all interactions were successfully coded using the model, the coder found one unaccounted case which may or may not have an impact in the representative capacity of the model to picture the complex narrative. Poignantly, the model did not code "death by proxy", meaning, when a character sends another character to kill someone, the killing is coded by the direct assassin and not by the initiator of events. As will be seen below, in the character analysis of Game of Thrones using the model we made only one exception to compensate for this: we took the actions of Daenerys Targaryan's dragons to be equivalent as Daenery's own.[2]

To proceed on the model-based operational character analysis we constructed a coefficient (relationship strength) that could be defined, based and expressed through a simple mathematical equation. We want to test if a proxy for "affinity between characters" or "character relationships" could be calculated without resourcing to psychological interpretations. We defined thus a character (x) relationship strength (R) with another character (y) as the total sum of interactions (I) of x towards y elevated to the third, divided by the number of interactions of x with y and then multiplied by the percentage that the number of interactions of (x) with (y) represent in (x) total number of interactions:

$$xRy = \frac{\sum xIy^3}{nxIy} * \frac{nxIy}{nxI}$$

ELEMENTS OF THE FORMULA:

Exponential increase: The interactions are elevated to the third under the assumption that the decrease in frequency of interaction type signals an increase in significance. On the other hand, the difference between talking and doing something-with is not the same as the difference between hugging someone and having sex with someone. Exploratively, we assumed the differences in the scale to increase exponentially and we chose the cubic incrementality to preserve the negative sign.

Pondered average interactions: Instead of only calculating the average value (to control for score simply indicating more or less interactions[3]), we pondered it by the percentage of interactions that character y represents in x total number as we wanted to maintain the narrative choice to emphasize some relationships over others, regardless of the text that the narrative signals (for example, that Catelyn Stark is the mother of Arya Stark)

CHARACTER SELECTION AND APPLICATION

Because this was an explorative approximation, to test the proximity of the formula to actual interpretative intuitions of relationships between characters we applied the formula to nine characters of the series. Given that we didn't want to use textual interpretative assumptions of "mayor" or "minor" characters our selection criteria was based on the total number of interactions the character took part in (given or received) (**See Approach**)

RESULTS

Table 3 shows the top five characters with whom the selected characters have the highest *relationship strength,* **Table 4** shows the bottom five characters. It is to notice that the coefficients for each character are comparable in their own scales but not with other characters as the proportion of character interactions within the entire three seasons has not been pondered. However, it turned to be always the case that when the value was -.30 or less it meant one character had killed the other.

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2   This has to do with the sense of "agency" created by commanding a human being to obey (which creates a certain independence), versus commanding a trained animal (real or fantastic) to obey.

3   This is very important because simply calculating number of interactions wouldn't have been reflective either of intensity nor of polarity. Tyrion Lannister, for example, is the character Cersei Lannister interacts the most, and as it will be shown in the results, this tells us little about the quality of the relationship.

Table 3: Top five scores for relationship strength between the characters in the top row and those in the subsequent columns

Tyrion Lannister	Daenerys Targaryen	Jon Snow	Arya Stark	Sansa Stark	Rob Stark	Ned Stark	Cersei Lannister	Catelyn Stark
Shae (1.06)	Karl Drogo (.68)	Ygritte (1.04)	Tywin Lannister (.16)	Joeffrey Baratheon (.52)	Talisa (2.19)	Arya Stark (.99)	Thomen Baratheon (.41)	Rob Stark (.53)
Sansa Stark (.44)	Dragons (.35)	Arya Stark (.27)	Ned Stark (.15)	Tyrion Lannister (.35)	Catelyn Stark (.59)	Catelyn Stark (.32)	Jaime Lannister (.18)	Ned Stark (.28)
Generic Prostitutes (.20)	Jorah Mormont (.34)	Benjamin Stark (.23)	Jaqen H'ghar (.13)	Cersei Lannister (.25)	Bran Stark (.33)	Sansa Stark (.20)	Sansa Stark (.13)	Brienne of Tarth (.20)
Catelyn Stark (.19)	The Dothoraki (.17)	Sam Tarly (.17)	Syrio (.12)	Olena Tyrell (.21)	Jon Snow (.17)	Robert Baratheon (.19)	Joeffrey Baratheon (.12)	Bran Stark (.14)
Bron (.13)	Generic Slavers (.03)	Bran Stark (.15)	Jon Snow (.11)	Lady & Ned Stark (.18)	Benjamin Stark & Dire Wolf (.12)	Renly Baratheon (.18)	Ned Stark (.05)	Roderick Cassel (.11)

Table 4: Bottom five scores for relationship strength between the characters in the top row and those in the subsequent columns

Tyrion Lannister	Daenerys Targaryen	Jon Snow	Arya Stark	Sansa Stark	Rob Stark	Ned Stark	Cersei Lannister	Catelyn Stark
Generic Stannis Soldiers (-.40)	Pyat Pree (-.44)	White Walkers (-.8)	Generic House Frey (-.70)	Generic Peasants (-.18)	Generic Characters (-1.21)	Generic Characters (-.58)	Tyrion Lannister (-.20)	Generic House Frey (.63)
Generic Characters (-.23)	Mirri Maz Duur (-.39)	Generic Characters (-.58)	Generic Characters (-.44)	Arya Stark (-.05)	Rickard Karstark (-.55)	Lady (-.32)	Lancel Lannister (-.13)	Little Finger (-.17)
Joeffrey Baratheon (-.21)	Kraznys mo Nakloz (-.34)	Orell (-.52)	Joeffrey Baratheon (-.19)	Maester Pycell (-.01)	Osha (-.25)	Jaime Lannister (-.21)	Loras Tyrel (-.04)	Generic Lannister Soldiers (-.12)
Lancel Lannister (-.04)	Xaro (-.33)	Generic Wildings (-.49)	Hot Pie (-.11)	Barristan Selmy (0)	Arya Stark (-.03)	Little Finger (-.12)	Small Council (S2) (-.03)	Talisa (-.12)
Robert Stark (-.03)	Doreah (-.13)	Ser Allister (-.07)	Generic Bandids (-.10)	Rob Stark (0)	Umber (-.03)	Sandor Clegane/Cersei Lannister (-.005)	Maggie Tyrell (-.03)	Jaime Lannister (-.1)

The resulted top and bottom characters obtained through the calculation appear to be not far off from what a more audience-based psychological assumption of the characters would propose4. However, this formula is capturing what the series is showing (registered observations according to the model), not what the series is saying. In this sense it is interesting that even if no information whatsoever has been given about the characters familial relationships, for example, the score seems to be accurate in signaling familial affections when is the case that those exist. A good example is Jon Snow mutual strong relationship with Arya Stark. Even if the characters only appear together in a few scenes of the first two episodes, the model was successful in indicating that between those characters there was a strong bond. It is, thus, promising that the indicator is not simply mirroring "number of interactions". Cersei Lannister interacts with Tyrion Lannister the most, but her relation is the top negative one, whereas she has few interactions with Tommen Baratheon, but when pondered, this is the character she shows the highest positive attitude. This can be an indicator that this model can bring something new to interaction-based analysis beyond simply tracking the Network.

Other interesting analysis can be made when these numbers are re-compared to the plot of the series. For example, Daenerys Targaryen is the only character whose bottom relationships are all dead by the end of the sample and whose dead she was directly involved with. She is also the only character to have killed more *individuals* than generic characters. It seems that with Daenerys *things get personal*. Out of these nine characters only Sansa and Cersei *are not killers*. Furthermore, the results seem to be accurately depicting the intricacies of the notorious narrative complexity of Game of Thrones (Silva, et.al. 2015). Catelyn Stark's strongest relationship is with Rob Stark, but Rob Stark's strongest relationship is with Talisa (with Catelyn coming second), however Talisa's features in Catelyn's list of *bottom* relationships. There could be an indicator that this might be an interpretation-free tool to track and define

what is usually called conflict. (Chunchum, 2012) A similar analysis could be done when tracking the complex relations of the Lannister family. Where top "friends" and top "enemies" are highly intermingled.

It is even possible to start "figuring out" a story by looking at the tables put together. Lady (Sansa's Stark Direwolf) has been shown to be valued by Sansa with as much intensity as his own father, Lady however is shown to have been killed by Ned Stark and Sansa Stark is the only Stark family member character to be more positively bonded with Lannisters than with Starks. The case of Tyrion Lannister is also worth diving into, as is the opposite, he does not show to be positively bonded with any Lannister, and his top four relationships are women, two of them Starks.

A liminal and therefore interesting case is that of Arya Stark. The score depicts the character as having low values in general (even in her stronger bonds); more importantly, it gives an almost identical bonding score to Tywin Lannister and to Ned Stark. As is the case of the model showing Cersei putting Tommen Baratheon by far above Jaime Lannister or having Arya Stark almost in the top bottom of Sansa Stark's relationships. This initially might seem counter-intuitive, but instead of showing a failure of the model it might be showing one of its biggest strengths —for through this unexpected "revealing". It's possible to notice what the story is showing beyond audiences' interpretative suppositions. In other words, not only is good at confirming what we already "know", but also signaling things that might have escaped our eyes at first glance.

CONCLUSIONS

The results show that the model as built features two particular strengths: 1) it portrays a numerical "picture" of a character's relationships with other characters solely based in unambiguous quantifiable observations beyond psychological suppositions, thus opening the way for a more empirical approach to complex-narrative analysis and 2) it makes it possible to obtain "a birds eye's view" of a complex narrative and the interconnected relations of the characters without resourcing to any verbal ore pre-given structural analysis of the content.

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4   We can compare this, for example, with the character assessments done in audience created sites like https://gameofthrones.fandom.com/ or https://tvtropes.org/pmwiki/pmwiki.php/Characters/GameOfThrones

This is promising, because through the validation of this construct it is possible to legitimize further analysis of complex serial visual narrative using this method. A way forward from this steppingstone would be to analyze the progression of such relationships *through the narrative time* and begin constructing new patterns of trajectories or "arcs" that will not need to be constrained to pre-defined models. Such analysis can be the natural follow-up to the work here presented. The model also suggests that traditional narrative concepts like "conflict" might have -in further explorations- a way to be expressed in defined mathematical formulations, opening yet another path of research.

The possibilities for testing and refining the model are numerous. Building a narrative model from scratch entails that the fitness of the model to the narrative and the fitness of the narrative to the model stand in an iterative feedback-loop. However, these initial results mark the possibility for replication of the work that we have done here by other communication scientists in this and other narratives, and of further analysis of the database we generated to find other possible patterns and methods to obtain more numerical depictions of a TV series. It would be interesting if other numerical interaction-based models can be built that also consider interaction *intensity* and *potency* but use different scales due to difference in genre and format.

We can see the interest about this kind of analysis being used —if extrapolated— to the study of actions through social groups. However, it is important to take into consideration that the mathematical approach was suggested as a way to standardize a phenomenon which appeared complex (the evolution of characters trough narratives) through pinpointing a way to assess its characteristics by defining a simple variable or factor. Social analysis, on the other hand, usually deals with real complexity, as social actors engage in open-ended interactions, with an entangled web of motivations, influences and in a space where clear, linear causality has been questioned (Castro Saez, 2011)

APPROACH

Training process

1. Coder 1 explained the theoretical aspects of the model to Coder 2 and presented broad definitions.

2. The coders watched a scene of the first episode of Game of Thrones, Coder 2 observed what Coder 1 registered while Coder 1 explained the reasons.

3. The coders registered together the next half hour of the episode, each one working on a different spreadsheet, talking, and commenting each instance.

4. The rest of the episode was registered independently and then compared, in case of discrepancies, the Coders explained their choices to clarify specific cases where situations might turn ambiguous, out of this process the following specifications were formed:

   » If a character is speaking to a large crowd, the coder will register the character addressed as a generic group with an assigned code, for example, if Catelyn Stark is talking to members of the Stark Household then the interaction is registered as Catelyn 1 Stark Household.

   » If it's not clear whether the character is refusing or threatening (-1 or -2), the Coder should go for the high value.

   » If two characters are speaking back and forth without a change in interaction then the interaction should be registered once and not every time they reply back,

5. Coder 2 proceeded to capture 5 episodes on her on, after this, another trained coder verified how she was doing, they watched and episode

together to verify Coder 2 was coding according to the rules and criteria and compered her first sample with that of Coder 1 to control for high discrepancies if it were to be the case.

6. After no high discrepancies were found we considered the training process complete.

COHEN'S KAPPA INTER-RATER RELIABILITY:

Out of those fifteen episodes, Coder 1 registered 3,504 interactions whereas Coder 2 registered 3,597; given the difficulty of comparing the registry face to face because of the slight discrepancy in interactions registries, we first took the median of interactions for each character that each coded register and the standard deviation of such median. We used the standard deviation of the median of each character for each coder; we got the average standard deviation for both codings to be comparable. If the difference between medians in Coder 1 and Coder 2 character registry was higher than the average standard deviation, we registered that the coders had not agreed on the specific character valuation.

Characters	Coder 1 Median	Coder 2 Median	C1StanDev	C2StanDev	SDTotal	Absolute Difference	SD-Absolute Difference
1	0.323	0.431	1.032	1.857	1.445	0.108	1.337
2	0.627	0.631	1.412	1.393	1.403	0.004	1.399
3	0.514	0.538	1.495	1.388	1.441	0.024	1.417
4	0.184	0.330	1.450	1.368	1.409	0.146	1.263
5	0.626	0.505	1.300	1.398	1.349	0.120	1.228
6	0.448	0.547	1.276	1.312	1.294	0.100	1.194
7	0.421	0.389	1.441	1.525	1.483	0.032	1.451
8	0.407	0.458	1.202	1.132	1.167	0.052	1.115
9	0.22	0.333	1.730	1.693	1.711	0.113	1.598
10	0.223	0.188	1.285	1.345	1.315	0.035	1.280
11	0	0.286	1.095	1.254	1.175	0.286	0.889
12	0.128	0.391	1.313	1.279	1.296	0.263	1.033
13	0.194	0.290	1.307	1.318	1.312	0.096	1.217
14	0.752	0.622	1.190	1.242	1.216	0.130	1.086
16	0.564	0.519	1.436	1.496	1.466	0.045	1.421
17	-0.043	-0.214	1.793	1.586	1.689	0.172	1.518

Game of Thrones seasons 1-3 : Characters ranked by
number of interactions

Character	nl
Tyrion Lannister	870
Daenerys Targaryen	689
Jon Snow	581
Arya Stark	546
Sansa Stark	454
Rob Stark	450
Ned Stark	429
Cersei Lannister	427

Character	nl
Catelyn Stark	393
Theon Greyjoy	389
Joffrey Baratheon	385
Bran Stark	342
Jaime Lannister	306
Jorah Mormont	262
Sam Tarly	259

Game of Thrones seasons 1-3: Interactions divided between given (left column) and received (right column)

Narrativa, ética y estética de la serialidad televisiva
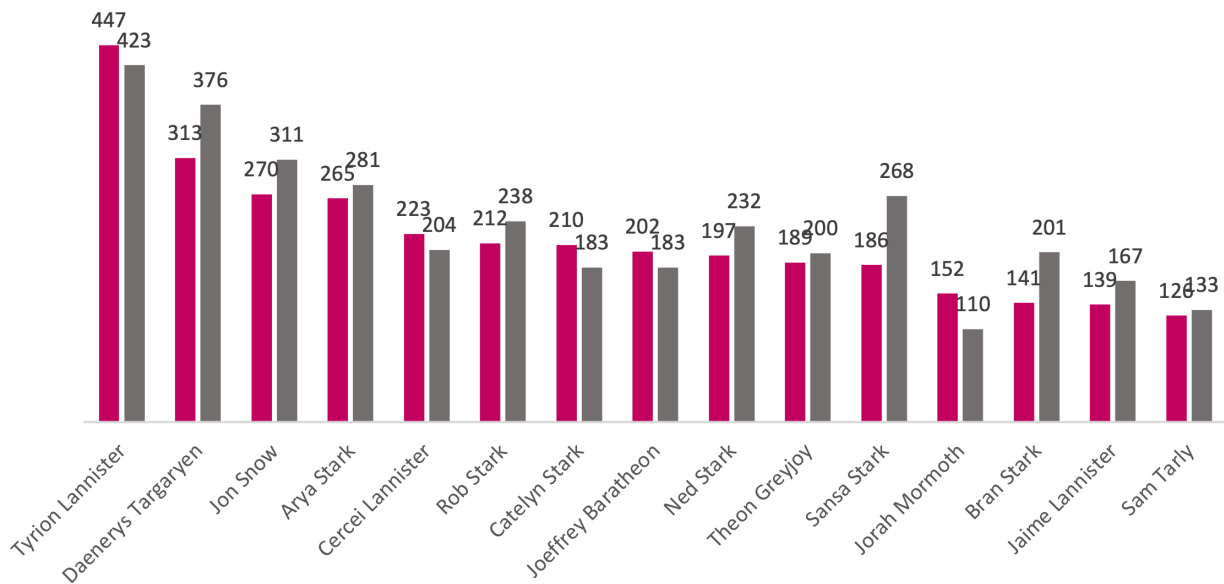
REFERENCES

» Bal, M., & Van Boheemen, C. (2009). *Narratology: Introduction to the theory of narrative*. University of Toronto Press.

» Bandelj, N (2003). How Method Actors Create Character Roles. In *Sociological Forum*, Vol. 18, No. 3 pp. 387-416.

» Beveridge, A., & Chemers, M. (2018). The Game of Game of Thrones: Networked Concordances and Fractal Dramaturgy. In *Reading Contemporary Serial Television Universes* (pp. 201-225). Routledge.

» Bignell, J. (2002). *Media semiotics: An introduction*. Manchester University Press.

» Blakey, E. (2017). Showrunner as auteur: Bridging the culture/economy binary in digital Hollywood. *Open Cultural Studies*, *1*(1), 321-332.

» Bost, X., Labatut, V., Gueye, S., & Linarès, G. (2016, August). Narrative smoothing: dynamic conversational network for the analysis of TV series plots. In *2016 IEEE/ACM International Conference on Advances in Social Networks Analysis and Mining (ASONAM)* (pp. 1111-1118). IEEE.

» Braga, P. (2019). The Italian Storytelling Approach to TV Seriality Compared to the US Method. A Case Study. *Comunicazioni sociali*, *41*(3), 380-394.

» Brembilla, P., & De Pascalis, I. A. (Eds.). (2018). *Reading contemporary serial television universes: A narrative ecosystem framework*. Routledge.

» Budniakiewicz, T. (1992). *Fundamentals of story logic: Introduction to Greimassian semiotics* (Vol. 5). John Benjamins Publishing.

» Buonanno, M. (2019). Seriality: Development and disruption in the contemporary medial and cultural environment. *Critical Studies in Television*, *14*(2), 187-203.

» Cascajosa-Virino, C. (2018). The emergence of the showrunner in global contemporary TV fiction: The case of Pau Freixas in Catalonia. *Catalan Journal of Communication & Cultural Studies*, *10*(1), 125-132.

» Casoli, S. (2019). *Le forme del personaggio. Tipologie, morfologie e sistemi di relazione degli individui finzionali nelle narrazioni seriali televisive contemporanee* (Doctoral dissertation, alma).

» Castro Sáez, Bernardo A. (2011) Aportes de Niklas Luhmann a la teoría de la complejidad. *Polis, Revista de la Universidad Bolivariana*, vol. 10, núm. 29

» Chunchun, S. H. E. N. T. U. (2012). Conflict trigger and its response mechanism in conflict talks——a case study of conflict talks in TV series. *Journal of Liaoning Technical University (Social Science Edition), 4*.

» Collantes, X. R., Obradors, M., Pujadas, E., Ferrés, J., & Pérez, Ó. (2011). Qualitative-quantitative analysis of narrative structures: the narrative roles of immigrants in Spanish television series. *Semiotica*, *2011*(184), 99-121.

» Dillman Carpentier, Francesca R.; Rogers, Ryan; and Barnard, Lisa, "Eliciting Behavior From Interactive Narratives: Isolating the Role of Agency in Connecting With and Modeling Charac-

ters" (2015). *Department of Strategic Communication Faculty Publications*. 7. https://digitalcommons.ithaca.edu/comm_management_faculty_pubs/7

» Doyle, C. L. (1998). The writer tells: The creative process in the writing of literary fiction. *Creativity Research Journal*, *11*(1), 29-37.

» Dreyfus, H. L., & Rabinow, P. (2014). *Michel Foucault: Beyond structuralism and hermeneutics*. University of Chicago Press.

» Eden, A., Oliver, M. B., Tamborini, R., Limperos, A., & Woolley, J. (2015). Perceptions of moral violations and personality traits among heroes and villains. *Mass Communication and Society*, *18*(2), 186-208.

» Galán, F.E. (2006). Personajes, estereotipos y representaciones sociales. Una propuesta de estudio y análisis de la ficción televisiva. Eco-Pos, 9 (1), 58-85.

» Galán, F.E. (2007). Fundamentos básicos en la construcción del personaje para medios audiovisuales. CES Felipe II, (7), 1-12.

» Gavin, R. (1996). " The Lion King" and" Hamlet": A Homecoming for the Exiled Child. *The English Journal*, *85*(3), 55-57.

» Gregori-Signes, C. (2017). "Apparently, women don't know how to operate doors": A corpus-based analysis of women stereotypes in the TV series 3rd Rock from the Sun. *International Journal of English Studies*, *17*(2), 21-43.

» Grizzard, M., Huang, J., Fitzgerald, K., Ahn, C., & Chu, H. (2018). Sensing heroes and villains: Character-schema and the disposition formation process. *Communication research*, *45*(4), 479-501.

» Grodal, T. (1999). Moving pictures: A new theory of film genres, feelings, and cognition.

» Gorton, K. (2009). *Media Audiences: Television, Meaning and Emotion: Television, Meaning and Emotion*. Edinburgh University Press.

» Gudiño Cícero, Yolanda José (2019) *Claves para la construcción de personajes metabólicos femeninos para series dramáticas de televisión: la última frontera* (Master Thesis, Universidad Intercontinental, Ciudad de México, México)

» Harris, D., & Willoughby, H. (2009). Resuscitation on television: Realistic or ridiculous? A quantitative observational analysis of the portrayal of cardiopulmonary resuscitation in television medical drama. *Resuscitation*, *80*(11), 1275-1279.

» Hawkes, T. (2003). *Structuralism and semiotics*. Routledge.

» Peter Kartyas (2016) Examination of the Correlation Between Self-Efficacy and Agency Based on the Content Analysis of Role Play Texts. *Transylvanian Journal of Psychology* Issue 2, p151-180. 30p.

» Kleemans, M., Eden, A., Daalmans, S., van Ommen, M., & Weijers, A. (2017). Explaining the role of character development in the evaluation of morally ambiguous characters in entertainment media. *Poetics*, *60*, 16-28.

» Krakowiak, K. M., & Tsay-Vogel, M. (2013). What makes characters' bad behaviors acceptable? The effects of character motivation and outcome on perceptions, character liking, and moral disengagement. *Mass Communication and Society*, *16*(2), 179-199.

» Landis, J. R., & Koch, G. G. (1977). The measurement of observer agreement for categorical data. Biometrics, 33, 159-174

» Lieberman, E. A., Neuendorf, K. A., Denny, J., Skalski, P. D., & Wang, J. (2009). The language of laughter: A quantitative/qualitative fusion examining television narrative and humor. *Journal of Broadcasting & Electronic Media, 53*(4), 497-514.

» Livingstone, S. (2013). *Making sense of television: The psychology of audience interpretation*. Routledge.

» Mann, B. L. (2008). The evolution of multimedia sound. *Computers & Education, 50*(4), 1157-1173.

» Mead, G. (1990). The representation of fictional character. *Style*, 440-452.

» Mittell, J. (2015). *Complex TV: The poetics of contemporary television storytelling*. NYU Press.

» Newman, M. Z. (2006). From beats to arcs: Toward a poetics of television narrative. *The velvet light trap, 58*(1), 16-28.

» Rojas, T. A. (2019). Transmedia Storytelling and Construction of Fictional Worlds: Aliados Series as Case Study. In *Correspondencias & Análisis, 9, enero - junio 2019*Sainsbury, R. M. (2009). *Fiction and fictionalism*. Routledge.

» Seidman, S. A. (1981). On the contributions of music to media productions. *ECTJ, 29*(1), 49-61.

» Silva, P., Amer, Y., Tsikerdanos, W., Shedd, J., Restrepo, I., & Murray, J. (2015, June). A game of thrones companion: Orienting viewers to complex storyworlds via synchronized visualizations. In *Proceedings of the ACM International Conference on Interactive Experiences for TV and Online Video* (pp. 167-172).

» Smith, G. M. (2006). A case of Cold Feet: serial narration and the character arc. *Journal of British Cinema and Television, 3*(1), 82-94.

» Sundet, V. S. (2016). Still 'Desperately seeking the audience'? Audience making in the age of media convergence (the Lilyhammer experience). *Northern Lights: Film & Media Studies Yearbook, 14*(1), 11-27.

» Sundet, V. S. (2017). Co-produced television drama and the cost of transnational 'success': The making of Lilyhammer. *Building Successful and Sustainable Film and Television Businesses: A Cross-National Perspective*, 67-88.

» Tefertiller, A., & Sheehan, K. (2019). TV in the Streaming Age: Motivations, Behaviors, and Satisfaction of Post-Network Television. *Journal of Broadcasting & Electronic Media, 63*(4), 595-616.

» Veale, T. (2014, June). Coming good and breaking bad: Generating transformative character arcs for use in compelling stories. In *Proceedings of the 5th international conference on computational creativity*.

» Vogler, C. (2017). Joseph Campbell Goes to the Movies: The Influence of the Hero's Journey in Film Narrative. *Journal of Genius and Eminence*, 9.