The Personality of Gangsters

Researching Quentin Tarantino's Character Design with the Use of Computer Based Psycholinguistic Analysis.

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Abstract

This paper presents a computer-based method that parses and analyses film scripts automatically. Various evaluation technologies are applied, including topic signal modelling, network analysis algorithms and psycholinguistic research techniques. With the use of these digital technologies, three films of the director Quentin Tarantino are evaluated in form of a case study. Furthermore, a method to create an archetype mapping out of psychological features is presented and discussed.

Keywords: Tarantino, psycholinguistics, archetypes

1. Introduction

The core of a dramatic story centres around characters, their needs, their nature, their way of acting and speaking as well as how they express themselves, how they interact and what their linguistic behaviours are. The following research describes a digital humanities approach which strives to combine and analyse these features through an automatic analysis of psychological patterns with the aid of computer-based methods. Originating in the film and drama analytics, it deals with special directors and their written film characters. The main research question is the following: „Which psychological patterns hide behind Tarantino's movie characters and their relation to each other? ".This is naturally based on the thesis, that special psychological patterns exist at all. The examination specialises on the cinematic work of director Quentin Tarantino and his distinctive character building.

> „Wills colleague on the set of the same film, Vingh Rhames, perceives Tarantino's writing style as „reflecting the image of the nature to itself […] this refers to the duty of art to resemble the natural. " [1]

The unique writing style and the pop cultural fan cult around Tarantino's characters that has been established over years lead to the question if there is a special pattern in the relation between characters and their own nature to other characters.

The theoretical background of this research relies on scientific papers in the psycholinguistics.

> „Psycholinguistics or psychology of language is the study of the interrelation between linguistic factors and psychological aspects. " [2]

There are different approaches to psycholinguistics: The "acoustical approach", which deals with audible properties of speech, the "lexical approach", which uses dictionaries to define the use of special words. The "n-gram approach" which deals with the connections of these words to each other and lastly the "speech act type", which examines the speech which is an action at the same time, e.g. a command. This paper focusses on the lexical part, which uses the researches of Pennebaker, King, Mehl, et al.[3] [4]

One of the main theses of this research is that each character has a unique psychological profile, which is deductible using psycholinguistic software and that this pattern has an influence on the structure of character relations. Thereby, it should be investigated if Tarantino uses a special character model in his films. To start an entry into the topic, three films of him will be evaluated closer in this paper. Furthermore, this paper will research the connection of character archetypes and if they are calculatable through psychological variables.

There is a similar working approach carried out by the „Natural Language and Dialogue Systems Lab" from California, which uses decision trees and different linguistic features, such as psychological variables in order to build models out of film characters. The learned models were created to mimic special roles in film.[5]

The following study however, in comparison, focusses more on Tarantino's character and speech structure itself and the possibility of automatically detecting archetypes.

1.1 The archetypes

'Collective unconscious' describes Carl Gustav Jung's theory concerning our human mind, being occupied by instincts and archetypes. This is a theory still relevant today.[6] After taking inspiration from Plato's theory of forms, called 'Eidos', Jung's 12 archetypes were created a long time before commercial cinema and Hollywood existed. Some of which are less important for the development of characters in current popular, mainstream movies.

[1] Struwe, 2011, p. 28
[2] Hojat, June, 2011, p. 2
[3] Pennebaker, King, 1999
[4] Mehl, Gosling, Pennebaker, 2006
[5] cf. Lin, Walker, 2011
[6] Breiner, 2018, p.22

In 1997, Christopher Vogler, a north American screenwriter published a book called *'The Writer's Journey: Mythic Structure for Writers '* [7] in which he combined Carl Jung's archetypes with Joseph Campbells take on the '*Hero's journey'* covered in his book '*The Power of Myth'*.[8] The now modified and optimised archetypes are commonly used for character development in movies and video games.[9]

Hero	Mentor / Sage	Ruler
Outlaw	Every-wo/men	Innocent
Lover	Caregiver	Shadow

Table 1: Archetypes presented by M.A. Faber and J.D. Mayer[10]

Because of the concern of inaccuracy and misinterpretation during this project, three archetypes were selected and used as a validation for the technical implementation. Within the genre of action and adventure, movies with traditional hero stories were selected to serve as a proof of concept. The *'Lord of the Rings'* trilogy provided excellent examples of three archetypes which formed the basis of the validation process. While hero and mentor/sage were unaltered, the third type of character was cut down to a villain.

Hero	"The protagonist who rises to meet a challenge and saves the day"[11]	Frodo
Mentor/ Sage	"A wise figure with knowledge for those who inquire" [11]	Gandalf
Villain	"their personality morphs based on the strengths and weaknesses of the hero"[12]	Saruman

Table 2: The chosen archetypes.

Archetypes like the hero are easily describable with attributes such as courage, honour, fighting for their values and saving the innocent. They often follow the "Hero's journey" starting with a call to adventure, getting help by the mentor/sage along the way facing challenges often too hard to master alone. It's at their lowest point, sometimes marked as their own death, that a rebirth happens, a transformation to reveal their true courage and power. Frodo Baggins, Luke Skywalker and Wonder Woman alias Diana Prince seem to be excellent representations of said archetype.
The mentor/sage, often described to be a very experienced individual, provides wisdom to the often naive hero, helping them find their destiny and providing shelter from cluelessness. Albus Dumbledore, Gandalf and Obi-Wan Kenobi are great examples of sages.

The villain can be described as the opposite of the hero. They shine in categories known to be weaknesses of individual heroes. A villain doesn't necessarily wish to doe evil, they are often motivated by, in their point of view, a greater good. Looking at Marvel's character Thanos, it is clear that his plan is to save something larger than humanity which, for him, could be achieved by killing half of all existing life.[13] This is exactly what a hero wants to avoid: the suffering of innocent people or creatures.

At the same time, a character like Saruman from '*The Lord of the Rings'*, who is "head of a council" and "Lord of Isengard" displaying a wise and powerful wizard is only driven by his sought of unlimited power, destroying everything standing in his way.
All three of these archetypes are very present in mainstream storytelling, but they can be difficult to identify. Characters are deeper written than being courageous or wise, they have emotions, background stories and events in the past forming their present. Ideally, characters do not reveal themselves as one of the common archetypes until the turning point of a movie.

2. Experiment setup and technical implementation

The technical implementation was focused on serving the main research question as well as generating data in order to provide an interactive tool to combine and pursue alternative questions and theses. To create the wanted data, the research strongly relies on computer-based methods. With the goal of providing comprehensibility and verifiability, the following part describes exactly how the data was generated and which tools were used.

2.1 Dataset

Following the idea of providing multiple information about the subject, the first aim was finding a suitable data source. To examine patterns as part of a case study, three Tarantino movie transcripts were scraped. '*Reservoir Dogs'*, *'Pulp Fiction'* and *'Jacky Brown'* (see 3). The dataset concerning the archetype fingerprints was build out of four movie transcripts which contain specific character archetype examples (see 2.7). Because the scripts were generated by consumers and fans, they had to be automatically cleaned to avoid possible mistakes, such as spelling mistakes, unmarked description of plot, action or the set. Some manual cleaning was still unavoidable to prevent disparate material and data pollution.

2.2 Core procedure

The whole project was written in Python 3 and used multiple libraries and packages. The main data flow started by simply cleaning and regex-parsing the scripts. Each script was tested on unique flaws to avoid data

[7] cf. Vogler, 1992
[8] Campbell, 1991
[9] cf. Faber, Mayer, 2009
[10] Faber, Mayer, 2009, p. 309
[11] www.masterclass.com/articles/writing-101-the-12-literary-archetypes#12-archetypal-characters-to-use-in-your-writing, 13.09.2019
[12] https://thewritepractice.com/how-to-create-better-villains, 13.09.2019
[13] https://en.wikipedia.org/wiki/Thanos, 13.09.2019

inaccuracies. Some films, for example *'Reservoir Dogs'*, contain characters who appear under different names. Non-conformances like this distort the following steps heavily. Characters were detected by taking advantage of specific writing styles in the scripts, such as bold text. For each character, a class was created and filled for example with their spoken text, names and scenes they appear in. Even characters with no text were kept, because of the following network analysis, their possible pertinence in other studies and to not to lose any gainable data. After the first preparation, three steps were built on each other to generate information in course of examining the research question.

2.3 Psychological patterns

First the aim was to detect psychological patterns and features of each character. This was realised by using the "Linguistic Inquiry and Word Count" tool. It was created by Prof. James Pennebaker and his colleagues at the University of Texas and is a dictionary-based software which uses a complex quantitative algorithm to analyse psychological factors in spoken words. The algorithm is not available via open source but in multiple descriptions on the procedure it is deductible that the algorithm brings together different calculations and provides reliable results.[14] The outcome provides a broad set of variables that were collected and stored to each appearing character, such as „Analytic Thinking" or the status the character has in a conversation. The limitation on only 20 different factors has been set because of the following archetype mapping and to maintain a remnant of human verifiability. An important factor to consider is the normalization of the categories. Some categories, for example „Analytic", „Clout" or „Authentic" often possess values between 10 and 100, on the other hand variables like „Anxiety" or „Anger" are often below 1, even if they have a relatively high value. The creators provide means of different speech categories, such as expressive writing, novels or natural speech.[15] This method normalizes to the expressive writing means, because even if film characters seem to resemble natural speech, they are still written characters of a story and from our perspective they had much similarities with these values.

To compare and validate these examinations, the empath topic signal modelling algorithm was applied. The similar working approach has as a broader set of variables and focuses more on identifying topics than psychological features. To a user of the web application, this provides a fast and intuitive possibility of evaluating characters. Concerning the research question this technically rather simple appearing yet efficient topic modelling approach should support the analysis of the relation between mental features and the subjects of the plot.

> „Empath learns word embeddings from 1.8 billion words of fiction, makes a vector space from these embeddings that measures the similarity between words, uses seed terms to define and discover new words for each of its categories, and finally filters its categories using crowds. " [16]

Only categories with values over 0.005 were written into the database.

2.4 Relation between characters

The second method deals with relation analysis. The approach is not specialised on researching in the specific type of relation the characters have to each other, like other sentiment analysis-based approaches try. The data tries to give more of an intuitive impression which characters are at the centre of the story and with who they interact. This was realised by creating a network structure through "networkX". This is "a Python package for the creation, manipulation, and study of the structure, dynamics, and functions of complex networks. " [17]

Because of the filtered data about the scenes in which a role appears and talks, it was possible to create a network and draw connections if two characters appear in the same scene. It is important to know that the edge only exists if a character talk at all. R2-D2 from the "Stars Wars" universe for example does not appear in the graph. Following this, the character builds the vertex and the undirected edges gain a weight based on the frequency of the shared appearance. Besides the quickly human readable visualisation of the graph structure, three different network analysis algorithms were applied. First the "PageRank" algorithm, which originates in web search engines and works by counting the number and quality of links to a vertex to determine a rough estimate of how important an object is.[18]

> „It can be computed by either iteratively distributing one node's rank (originally based on degree) over its neighbours or by randomly traversing the graph and counting the frequency of hitting each node during these walks." [19]

The others are two centrality algorithms, the degree centrality, which is defined as the number of links of a node and the closeness centrality, which is calculated by the average length of the shortest path between a vertex and all other vertexes in the graph.[20] [21] These are destined show different approaches of examining the importance of

[14] https://www.klinikum.uni-heidelberg.de/zentrum-fuer-psychosoziale-medizin-zpm/institut-fuer-psychosoziale-praevention/forschung/forschungsstelle-fuer-psychotherapie-fost/forschung/instrumente/liwc/, 12.09.2019

[15] Pennebaker, Boyd, Jordan, Blackburn, 2015, pp. 10,11

[16] Fast, Chen, Bernstein, (2016), p. 2

[17] https://networkx.github.io/, 12.09.2019

[18] cf. www.web.archive.org/web/20111104131332/ https://www.google.com/competition/howgooglesearchworks.html/, 10.09.2019

[19] https://neo4j.com/docs/graph-algorithms/current/algorithms/page-rank/

[20] https://neo4j.com/docs/graph-algorithms//, 12.09.2019 current/algorithms/closeness-centrality/, 12.09.2019

[21] https://neo4j.com/docs/graph-algorithms/ current/algorithms/degree-centrality/, 12.09.2019

specific characters and compare the results to other analyses, such as the archetype matching.

2.5 Archetypes

The necessary theoretical background is dealt with in chapter 1.1. The creation of the psychological fingerprint is discussed in chapter 2.7. The technical realisation of the archetype mapping calculates the percentage deviation of each psychological character trait to the fingerprint. Out of the deviation the accordance is calculated. After that, all the variables are added together and form the percentage of the match.

2.6 Web-App and database

The web application was created by using "flask", "HTML" and "CSS", "d3", "jquery" and "plotly". Concerning the displayed graph, the edges are drawn in relation to the weight. The main feature is built by the underlying relational database which is filled with all the data generated as explained above. Database tables are for example "film", "character", "charts", "network results" etc. The whole database and the app are coded to sustain the extensibility of the database.

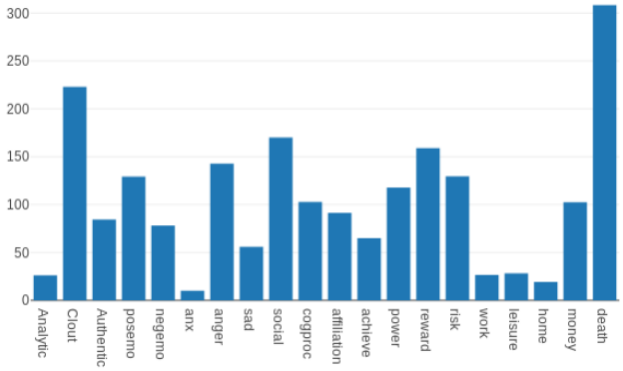
2.7 The Fingerprint

To examine the thesis that archetypes are visible through psychological character profiles, the following part deals with the creation of a psychological fingerprint of archetypes. Throughout the computer-based examination, a set of 20 chosen psychological attributes and their values are assigned to each character. The variables are calculated by using the spoken text and the "liwc" software. (see section 2.3) Based on normalized values, each attribute is rather high or low, over or below 100%.

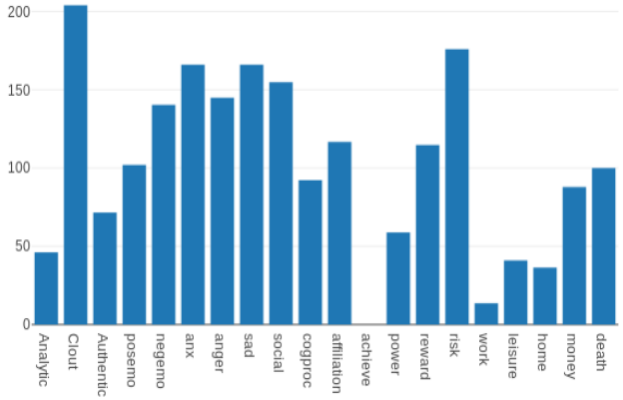
The aim of the approach is finding or generating a unique ratio of these values. A naive way could be implemented by using the scientific background about the archetypes and based on that, trying to estimate standard values of each attribute. The other possibility, which is pursued in this paper attempts building a fingerprint out of algorithmic results of known archetypes from film history. Thereby, the value ratio of the main archetypes hero, mentor and villain is evaluated. Because the research is built on a case study, the collected data is not completely sufficient to ensure statistical safety, yet the blueprint modelling is based on the mean out of several thousand words for each archetype.

2.7.1 The Hero fingerprint

To give a brief example how each fingerprint is created, the hero fingerprint will be explained in more detail. In order to find the value ratio suiting the character, a blueprint is „trained" with Frodo from the *'Lord of the Rings – The Fellowship of the Ring'* and *'Lord of the Rings – The Return of the King'*, Luke Skywalkers text from *'Star Wars – A New Hope*' and Wonder Woman's text from Patty Jenkins' film *'Wonder Woman'*.



Picture 1: Psychological values of Luke Skywalker in Star Wars – A New Hope



Picture 2: Psychological values of Frodo in Lord of the Rings – The Fellowship of the Ring

On the first look the charts appear to differ from each other. The main cause for that is the death value of Luke Skywalker is about 300, compared to Frodo's 100, but in fact the Clout level for example is nearly the same. To generate a mean value out of all, all words were combined and a mean out of around 5000 words was calculated through the "liwc".

As also readable through *Table 3*, the topics of the hero are closely related to death, anger, social processes and risks. Rather low is the analytic value.

2.7.2 The Mentor fingerprint

The blueprint of the character values to represent the mentor figure was created out of around 4000 words of Gandalf from the *'Lord of the Rings – The Fellowship of the Ring'* and *'Lord of the Rings – The Return of the King'*, Ben Kenobi from *'Star Wars – A New Hope*' and Antiope from Patty Jenkins' film *'Wonder Woman'*.

2.7.3 The Villain fingerprint

The values concerning the villain figure are calculated through around 2000 words of Saruman and the Witch-King from the *Lord of the Rings – The Fellowship of the Ring'* and *'Lord of the Rings – The Return of the King'*, Darth Vader and Grand Moff Tarkin from „*'Star Wars – A New Hope*' and Ares from Patty Jenkin's film *'Wonder Woman*'.

Psychological variable	hero	mentor	villain
analytic	27	112	95
clout	219	222	233
authentic	59	28	42
positive emotion	117	108	108
negative emotion	149	144	201
anxiety	84	96	158
anger	322	245	502
sad	108	128	84
social	175	147	164
cognitive processes	97	83	94
affiliation	88	91	102
achieve	59	70	128
power	125	156	290
reward focus	114	77	70
risk	161	138	155
work	28	19	33
personal concern leisure	34	41	17
personal concern home	15	21	16
personal concern money	65	65	39
personal concern death	800	425	483

Table 3: Archetype fingerprints. All values in percent. (normalized, see section 2.3)

Beside the high-ranking "personal concern death" variable, which seems to be reasonable concerning the training data that was build out of "war stories", the high level of power, anger and negative emotion on the villain's side could be seen as remarkable. Same applies for the rather low analytic level of the hero compared to the other two archetypes.

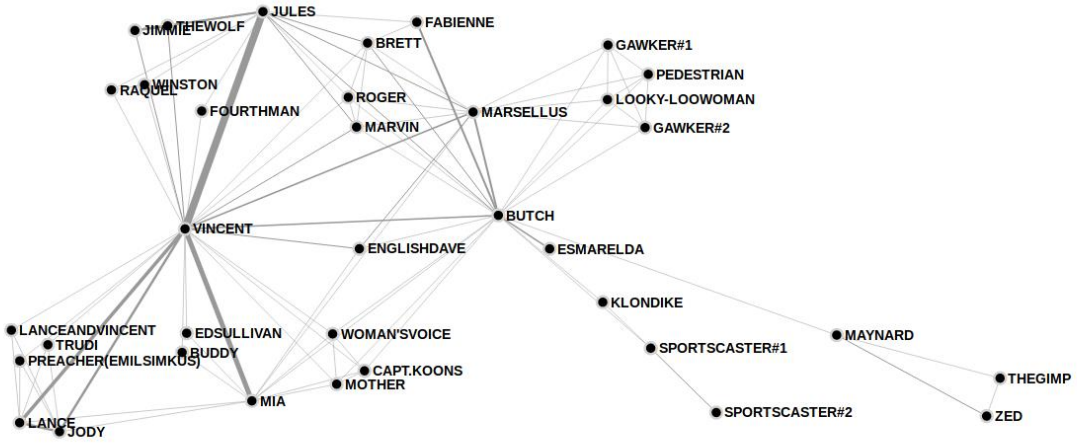
3. Results

The following case study focuses on one film by Tarantino, particularly the constellation and the specific characteristics of the appearing figures. After that, the outcome will be compared and put in relation to other results.

3.1 Pulp Fiction

The plot of Quentin Tarantino's *'Pulp Fiction*' can be described as a story about two mob hitmen, Vincent and Jules, , a boxer, Butch, a gangster boss and his wife, Marsellus and Mia, as well as a pair of diner bandits intertwining in four tales of violence and redemption.[22]

> „[...] After all, these pieces of literature were the role model for this movie; thus, its protagonists are gangsters, tricksters, femme fatales, the man for



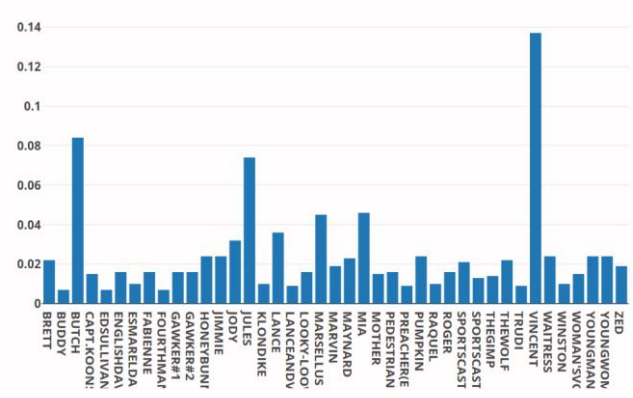
Picture 4: Character relations Pulp Fiction.

[22] https://www.imdb.com/title/tt0110912 /plotsummary/, 13.09.2019

special cases, etc.; in short, anti-heroes with their backs up against the wall. “ [24]

Although Tarantino seems to have a bias towards gangster-like attitudes and characteristics. Also *‘Reservoir Dogs’* which is the film *‘Pulp Fiction’* will be compared to, circles around the relations inside a gangster squad. Formally, *‘Reservoir Dogs’* is a classical heist movie, a movie about gangsters, in which the coup fails. “[25]

To select the characters that will be investigated closely the relation analysis is taken account of. Based on the graph in *Picture 4* it is observable that some figures centre themselves inside of the relation web. The “PageRank” algorithm continues to show the specific importance of Vincent Jules and Butch. (see *Picture 5*). Visible through this network algorithm, also Mia and Marsellus seem to have an important role but the plot moves around the three characters. For now, only the character with the highest “PageRank” is observed deeply.



Picture 5: “PageRank” values of Pulp Fiction.

3.1.1 Vincent Vega

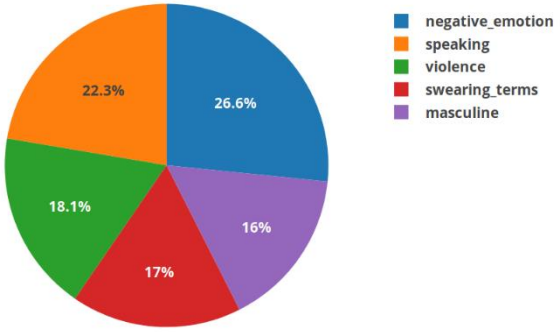
As described above, Vincent Vega is a character originating in a criminal milieu and in order to find a pattern behind Tarantino’s written roles, he could be an example of how Tarantino creates his gangster figures. Referring to *Table 4*, his Clout level is high compared to the analytic level.

> „Clout refers to the relative social status, confidence, or leadership that people display through their writing or talking. “ [26]

Summary variables		Highest other values	
Clout	165	anger	485
Analytic	43	Personal concern money	170
Authentic	45	negative emotion	160

Table 4: “liwc” Results: Vincent Vega, Pulp Fiction. All values in percent. (normalized, see section 2)

The empath topic modelling algorithm shows that Vincent’s main topics consist of negative emotions, violence, swearing and masculinity.



Picture 6: Empath Topic Modelling Vincent.

One of the main parts of the film is the transformation of the character Jules and his relation to Vincent.[27] There is a scene in the film where Jules nearly gets shot and killed and he interprets this as a divine intervention.

> „The importance of this is not that it really was divine intervention, but rather that the incident spurs Jules on to reflect on what is missing. “ [28]

The psychological values of Jules reveal that his “personal concern death” of 175 percent is indeed higher than Vincent’s which is calculated to 41 percent. The highest archetype in the matching of Vincent is the hero, with 53 percent, although the difference to the mentor is only 3 percent. Jules is matched with the mentor with 51 percent, the nearest other matching is the hero with 43 percent. A question could be if behind Jules’ hesitation and transformation and Vincent’s consistency hides something like a mentor hero relation.

[24] Radtke, 2004
[25] http://www.filmzentrale.com/rezis/reservoirdogs.htm, 12.09.2019
[26] http://liwc.wpengine.com/interpreting-liwc-output/, 13.09.2019
[27] cf. Conard, 1997
[28] Conard, 1997

3.2 Comparison

The characters Mr. White and Mr. Orange have the highest "PageRanks" in Tarantino's film *'Reservoir Dogs'*, so they will be compared to Jules and Vincent.

Psychological variables to compare	Mr. Orange	Mr. White
Clout	98	194
Analytic	60	39
Authentic	92	43
anger	384	661
personal concern money	525	733
personal concern death	131	167
negative emotion	167	219

Table 5: "liwc" Result Examples Reservoir Dogs. All values in percent. (normalized, see section 2.)

As mentioned above, '*Reservoir Dogs'* is a film about a heist, which explains the „personal concern money "-level.

The comparison between these characters indicates that Tarantino's gangster like figures express themselves through anger and violence, which is always under the top ten topics, with a drive to leadership and negative emotion. The figures specify far less in authentic values, which would mean that they would express themselves in humble and vulnerable ways, or the analytical thinking value.[29]

The result that masculinity is one of the main topics of Vincent Vega, who is at the centre of the plot in *'Pulp Fiction*', put in relation to his other remarkable attributes is a topic itself. The construction of masculinity through these characters could be researched by using the combined psychological features, such as the anger or power values.

Concerning the "PageRank" of Tarantino's film *'Jackie Brown*' the figures Ordell and Jackie are at the centre of the plot. Ordell as a male character has a similar relation between the features to Vincent or Mr. White. Jackie appears to be similar but has a lower anger level.

> „The complexities of Jackie Brown's character can be translated by observing her multi-layered character composition. Miss Brown is desperate to survive, equipped with a built in No Nonsense Detector, and a convincing trickster. But when she comes across a man, Max Cherry, who wants her attention and not to merely use her for self-gain, she shares a hospitable, loving side of vulnerability that is at her core, if only the world around her didn't force her to remain hidden behind her hardened protective shield."[30]

Jackie seems to be slightly more complex, which could be considered as a difference between male and female characters, however she resembles the others at a high level. This, on the other hand, could also be regarded as a contrary argument to the alleged male figure character design of Tarantino, which uses the construction of masculinity. The presentation of a criminal „trickster" is relatively conform to the characters of *'Reservoir Dogs'* and *'Pulp Fiction*'.

Psychological variables to compare	Ordell	Jackie
Clout	200	159
Analytic	66	88
Authentic	52	34
anger	512	224
personal concern money	365	351
personal concern death	116	116

Table 6: "liwc" result examples Jackie Brown. All values in percent. (normalized, see section 2.)

3.3 The Personality of Gangsters

Concerning the rather low accordance of the archetypes hero, mentor and villain, the idea arose that the particular attributes of Tarantino's "tricksters" and "gangsters" build something like a special archetype themselves.

The values of *Table 7* were calculated by using each of the three highest ranking ("PageRank") characters of *'Pulp Fiction*', *'Reservoir Dogs*' and '*Jackie Brown*'. This blueprint could be used as a comparison if a character seems to have "Tarantino like" features.

Visible through this data and the comparison above, it can be proposed that the following scheme is a psychological pattern hiding behind Tarantino's central characters.

Psych. variable	Tarantino's Gangster	Psych. variable	Tarantino's Gangster
analytic	49	affiliation	71
clout	191	achieve	50
authentic	60	power	97
positive emotion	94	reward focus	129
negative emotion	151	risk	112
anxiety	80	work	37
anger	442	personal concern leisure	52
sad	50	personal concern home	40

[29] http://liwc.wpengine.com/interpreting-liwc-output/, 13.09.2019

[30] Myers, 2014

social	175	personal concern money	239
cognitive processes	90	personal concern death	266

Table 7: Tarantino's gangster "archetype". Five highest values marked in red, lowest in yellow. All values in percent. (normalized, see section 2.)

4. Conclusion

The presented case study is only a short insight into the possibility of using the outcome. As explained above, a pattern of a masculine character at the centre of Tarantino's plots is starting to appear. The pattern that has been found consists of different psychological features. A similar approach should be followed in subsequent researches. The small case study reveals that Tarantino has a distinctive way of displaying and writing criminal figures.

There are multiple factors, which can be adequate to adjust and develop to raise the accuracy of the results. First, to analyse Tarantino's characters more in depth, more of his films need to be examined and compared. Also, the normalization of the values to the expressive writing mean should be reconsidered as well as the archetype mapping procedure. It could be promising to use statistical learning methods and calculate special variables with different weightings, this could be realised by implementing a damping ratio for several features.

The introduced method shows an outcome that can be applied onto other film series or directors and could be a tool that serves film science orientated researches.

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