**A NEW METHOD OF COMPARATIVE ANALYSIS OF THE DOPPELGANGER TOPOS**

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**Abstract**

The objective of our research is to view the literary topos of doppelganger through the critical lense of the mathematical method that allows one to address several issues of comparative literature. We employ quantitative analysis, namely, the elementary approach provided by graph theory. Our point of departure was the archetypal attributes of the double highlighted in Otto Rank’s seminal work of 1914. To Rank’s list of attributes of the double, we added a list of other, specifically “poetic,” attributes, i.e. a set of diverse invariant motifs found in thirteen canonic doppelganger texts. In the paper, we tackle the following questions: A) Is it possible to estimate to what extent the doppelganger topos in a particular text is similar to or different from the one in other texts? B) Does the estimated “degree” of similarity tell us anything new about the texts under scrutiny? C) What do obtained results tell about the evolution of the topos? D) How does the presence or the absence of a particular function or functions of the topos affect doppelganger text in terms of its typicality, on the one hand, and in terms of its influence on the subsequent doppelganger fictions, on the other. Thequantitative methodled to several importantqualitativeconclusions: it highlighted the “frontrunners” among doppelganger fictions. Fyodor Dostoevsky’s *The Double*, Joseph Conrad’s “The Secret Sharer” and Théophile Gautier’s “The Two Actors for One Part” apparently provided the best working doppelganger imagery “recipes,” most adaptive for various artistic goals.

**Key words**: topos, doppelganger, mathematical methods in literary criticism, comparative studies, E. A. Poe, Fyodor Dostoevsky, E. T. A. Hoffmann, Henry James, Joseph Conrad, A. von Chamisso, H. Chr. Andersen, Nikolai Gogol, Guy de Maupassant, Théophile Gautier, R. L. Stevenson, Vladimir Nabokov

**Introduction**

Initially, quantitative methods were employed for the purpose of stylometry alone, statistics being the main tool of this kind of research. Over the past decades, scholars of literature have been trying to broaden the spectrum of mathematical methods used in literary criticism. Thus, Maranda (1972) applied mathematics to analyze textual structure in the vein of Lévi-Straussian approach to myth (Lévi-Strauss, 1955). Structuralists turned to the graph theory to highlight the interconnections of literary characters in the text. The Graph theory provides a working language for the description of the specific structure of characters’ communication in various scenes and episodes, as well as a means of identifying the “levels” or “spaces” in which characters function – at any rate in folklore texts (Maranda, 1973). The distinctive feature of such works is the simplicity of mathematical instruments used for analysis. The simplicity, however, did not prevent the scholars to achieve some meaningful results that are still relevant.

Other scholars, such as Ron Atkin (1982) and his followers (Casti, 1979; O’Tool, 1980), apply a more complicated technique of the graph theory, the so-called Q-analysis. It is also worth mentioning that the advances in the Digital Humanities made the methods of Social Network analysis popular in several fields including literary research (Neumann, Dion & Snapp, 2021, pp. 41-56).

In our previous publications, we described our approach to the quantitative analysis in literary studies. In brief, such research includes three stages. Firstly, we define what features of the chosen texts we are going to quantify. Then, we apply the most adequate mathematical method to investigate the chosen features. Finally, we assess the obtained results in the framework of literary criticism.

The above scheme does not depend on a specific mathematical method. We adhered to this scheme when we employed differential equations to view temporal/ spacial characteristics of two fictions (Zhuravlev, Golovacheva & de Mauny, 2014; Zhuravlev, Golovacheva & de Mauny, 2015; Golovacheva, I., Zhuravlev, M. & de Mauny, 2017). Similarly, we followed the same pattern in (Golovacheva, Stroev, Zhuravlev & de Mauny, 2018; Golovacheva, de Mauny & Zhuravlev, 2021; Golovacheva & Zhuravlev, 2022) when applying the graph theory to research literary *topoi* (Curtius, 1948/1953). In the following sections, we discuss the new results of comparative analysis of the **doppelganger topos** in thirteen texts with the help of the graph theory.

**Texts and method**

Having selected the canonic short fictions in which the protagonist encounters his double, we investigate all archetypical psychological phenomena explicated in Otto Rank’s seminal book *The Double* (1925/2009). Rank, due to his specific psychoanalytical objective, limited the list of doppelganger attributes to psychological ones. We added our own list of attributes, i.e. invariant “poetic” motifs, all of which are indispensable in fictions featuring “the theme of the other” (Todorov, 1970/1975, pp. 124–139), especially in case the protagonist’s self is split or multiplied.

In order to present a more objective picture of the doppelganger discourse, we doubled the previous list of short fictions (Golovacheva, de Mauny & Zhuravlev, 2021) that included “Der Doppeltgänger” (1821) by E. T. A. Hoffmann, “William Wilson” (1839) by E.A. Poe, *The Double* (1846) by Fyodor Dostoevsky, “The Jolly Corner” (1908) by Henry James, “The Secret Sharer” (1910) by Joseph Conrad, and *Despair* (1932-34) by V. Nabokov. Seven other texts were added: “Peter Schlemihl” (“Peter Schlemihls wundersame Geschichte”, 1814) by A. von Chamisso, “The Shadow” (“Skyggen,” 1847) by H. Chr. Andersen, “The Nose” (1836) by Nikolai Gogol, “Two Actors for One Part” (“Deux acteurs pour un role”, 1841) by Théophile Gautier, “The Devil. Ivan Fyodorovich's Nightmare,” a chapter from *The Brothers Karamazov* (1879–1980) by F. Dostoevsky, “Horla” (“Le horla,” 1886) by G. de Maupassant, and *The Strange Case of Dr. Jekyll and Mr. Hyde*, 1886) by R. L. Stevenson. This is an exhaustive list of short canonic texts representing the doppelganger topos in Western and Russian literary traditions. Here, we view the doppelganger poetics on a much larger scale as compared to that in the previous research.

All selected attributes are divided into four groups: “psychological attributes of doubling,” “physical manifestations of doubling,” “elements of biography in doubling,” and “mysterious attributes of doubling.” We construct an **incidence matrix** (Casti, 1979) for each group to show in which text a certain attribute appears. Then we define the degree of similarity in each group. Finally, we demonstrate the similarities and dissimilarities of texts basing on the complete list of all attributes in the four groups.

By way of example, we present the results obtained for “**psychological attributes of doubling**” group for our thirteen texts in Table 1.

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
|  | Horror | Madness | Aggression | Narcissism | Anxiety |
| William Wilson | 1 | 1 | 0 | 0 | 1 |
| Jolly Corner | 1 | 0 | 1 | 0 | 1 |
| Secret Sharer | 1 | 1 | 1 | 0 | 1 |
| Doppeltgänger | 1 | 1 | 0 | 0 | 1 |
| *Despair* | 1 | 1 | 1 | 1 | 1 |
| Peter Schlemihl | 1 | 1 | 0 | 1 | 0 |
| Shadow | 0 | 1 | 1 | 1 | 0 |
| Nose | 1 | 1 | 1 | 1 | 0 |
| Horla | 1 | 1 | 1 | 0 | 1 |
| Two Actors | 1 | 0 | 1 | 1 | 1 |
| The Devil | 0 | 1 | 1 | 0 | 1 |
| *Double* | 1 | 1 | 1 | 1 | 1 |
| *Jekyll| Hyde* | 1 | 1 | 1 | 1 | 1 |

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  | Malevolence | Assistance | Double’s mocking imitation of the original | Disgust when encountering a double |
| William Wilson | 0 | 1 | 1 | 1 |
| Jolly Corner | 0 | 0 | 0 | 1 |
| Secret Sharer | 0 | 1 | 0 | 0 |
| Doppeltgänger | 0 | 1 | 0 | 0 |
| *Despair* | 0 | 0 | 0 | 0 |
| Peter Schlemihl | 0 | 0 | 0 | 0 |
| Shadow | 1 | 1 | 1 | 0 |
| Nose | 1 | 1 | 1 | 1 |
| Horla | 0 | 1 | 0 | 1 |
| Two Actors | 1 | 1 | 1 | 1 |
| The Devil | 1 | 1 | 1 | 1 |
| *Double* | 1 | 1 | 1 | 1 |
| *Jekyll| Hyde* | 0 | 1 | 0 | 1 |

Table 1: Incidence matrix for the group “Psychological attributes of doubling”

At this point, we shall briefly explain how an incidence matrix is constructed. Each element of the matrix is positioned at the cross of a row corresponding to a specific text and a column corresponding to a specific attribute. In Table 1, we put **1** in the box corresponding to text **n** and attribute **m** in case the attribute is found in the text. E.g., at the cross of the second line (“The Jolly Corner”) and the third column, we put “**1**” because the episode of James’s protagonist Spenser Brydon’s struggle with his double is a scene of aggression. We have no reason to speak of madness (insanity) in this case. Hence, we put “**0**” at the cross of the second line and the second column.

We use the following method to estimate the similarity between each pair of the texts in the set. We define “**index of similarity**” of a pair of texts as the sum of coincidences of attributes, i.e. the sum of coincidences between the corresponding lines of the incidence matrix. Therefore, **coincidence** is the simultaneous presence or absence of an attribute in two texts, in other words, a coincidence is the presence of either two “ones” or two “zeros.” The symmetrical matrix of the indexes of similarity (“**matrix of similarity**”)  can be obtained as the product of incidence matrix by its transpose  if we multiply the elements 0, 1 not as the numbers but according to the following rule: , , , . The diagonal elements of  are equal to the number of attributes.

The matrix of similarity of the texts in relation to “psychological attributes of doubling” is presented in Table 2.

An element at the **n**-th row and **m**-th column of the matrix, where n ≠ mis an index of similarity between texts “**n**” and “**m**”. For instance, the index of similarity between “The Secret Sharer” and *Despair* is 7. As seen in Table 1, the two fictions reveal quite a lot of coincidences.



Table 2. The matrix of similarity of the texts in relation to “psychological attributes of doubling”

The obtained results are can be visualized in the graph below (Fig.1).

Schlemihl

*Despair*

*Jekyll/Hyde*

**4**

Secret Sharer

**4**

Horla

5

Doppeltgänger

Wilson

*Double*

**4**

Devil

Nose

Two Actors

Shadow

Jolly Corner

Figure 1. Graph for “Psychological attributes of doubling”

In Fig.1, a pair of texts is linked with an edge if they reveal their strong similarity, i.e. maximum number of coincidences or one less – 8 or 7 in our case. Such figure allows one to see how texts combine in clusters. Four texts, which are found in the highest number of pairs, are “Horla,” “The Secret Sharer,” *The Strange Case of Dr. Jekyll and Mr. Hyde*, and *The Double*. The numbers 4 and 5 placed below the titles mark the number of pairs including these works. For instance, "The Secret Sharer” shows a considerable similarity with four other texts. The works that are similar to Dostoevsky’s *Double* form a separate cluster, as seen in the lower left part of the figure.

So far, we have been speaking of a “**strong similarity**” between texts. We may ask at this point, what the **total number of coincidences** of a given text with all other texts is. (The coincidence, as noted above, is the simultaneous absence or presence of a certain attribute in two texts). To calculate the number of such coincidences for each text, we are to add all numbers in a corresponding row of the matrix (Table 2) and extract the number found on the diagonal – the number of coincidences with the text itself, which is identical for all texts and equals the number of attributes in the group (it is 9 for the “psychological attributes of doubling”). For example, the number for “The Jolly Corner” is 5+9+6+5+6+4+1+3+7+5+4+4+6-9=56. It is not axiomatic that the texts demonstrating the highest number of **allcoincidences** would be the same texts that form a group of fictions with the highest number of **coincidences of pairs** (for the given group of “psychological attributes,” these are *The Strange Case*, “The Secret Sharer,” “Horla,” and *The Double*). To check it, we show in braces the total number of coincidences of each text with all others for the given group of attributes. The order of numbers corresponds to the order in the column with titles. For instance, 64 is the total number of coincidences demonstrated by Poe’s “William Wilson,” whereas it is 56 for “The Jolly Corner,” etc.:

{64,56,*69*,62,63,49,50,62,**72**,60,59,*69*,**73**}

As one can see, Stevenson’s novella and “Horla” show the maximum number of total coincidences – 73 and 72 respectively. “The Secret Sharer” and “The Double” also display high number – 69. Thus, the four texts appeared to be “frontrunners” not only for “**pair coincidences**”, but also for the **total number of coincidences** of “psychological attributes” in our thirteen canonical texts.

The top position of *The Strange Case of Dr. Jekyll and Mr. Hyde* and “Horla” in the “psychological” group is worth commenting on. One can hardly find a more “psychotic” text featuring the doppelganger than Maupassant’s short story in which the action both begins and ends in a mental institution. As for Stevenson’s novella, suffice to say that there is a psychiatric diagnosis bearing the name Jekyll and Hyde syndrome (Engel 2007). The specific imagery of Stevenson’s story influenced such notable 20th century psychopathological fictions featuring **multiple personality** rather than a double, as *The Minds of Billy Milligan* (1981) by Daniel Keyes (Golovacheva & Solovyeva, 2018) and Robert Bloch’s *Psycho* (1959). We should also include **the demonic possession fictions**, like William Peter Blatty’s *The Exorcist* (1971), in the multiple personality thriller genre.

Doppeltgänger

*Double*

*Jekyll/Hyde*

Secret Sharer

.

Nose

Two Actors

**5**

*Despair*

Wilson

Shadow

**7**

Horla

Devil

Schlemihl

Figure 2: Graph for “Physical attributes of doubling”

We use the same instrument to assess the similarity or difference of our texts in relation to the other three groups of attributes. Besides “psychological attributes of doubling,” we looked into the “**physical manifestations of doubling**.” They are “the reality of the double,” “the unreality of the double,” “real similarity between the character and his double,” “imaginary similarity between the character and his double,” and “objects/signs related to doubling.”

In Fig. 2, we see one cluster of strongly connected texts: *The Double*, “Der Doppeltgänger,” “The Nose,” “The Shadow,” and “The Two Actors for One Part.” Andersen’s story shows maximum number of coincidences with **seven** texts, while Gautier’s – with **five**.

The texts showing the maximum number of total coincidences are “The Secret Sharer,” “Der Doppeltgänger,” “The Shadow,” “The Nose,” “Horla,” *The Double*, and *The Strange Case*: {38,29,*45*,*45*,43,36,**50**,*45*,*45*,40,27,*45*,*45*}. “The Two Actors” are a bit behind (40). The high position occupied by “The Shadow” (**50**) is not accidental. The archetypal **shadow** in myth and superstitions functions not only as an etheric replica, but also as a body part surviving death.

The third group comprises “**elements of biography**” such as “childhood,”“alternative life,” “end/beginning*,*”“ruining of the plans,” “rivalry for affection,” and “Thanatos.” “End/beginning” attribute signifies that the finale, or the final event in the development of the plot, is at the same time the beginning of a new phase of the protagonist’s existence – be it a new life or death.

Horla

Devil

*Despair*

Wilson

*Jekyll/Hyde*

Two Actors

Secret Sharer

Nose

Figure 3: Graph for “The elements of biography in doubling”

Fig. 3 shows four pairs of the leading texts in “the elements of biography in doubling” group. Each text has only **one connection with a single other fiction** here. This seemingly unusual picture is, in fact, quite natural: any writer desires to present a fictional character whose biography would be **unique**. Each new doppelganger story, no matter how unusual its protagonist is, should still reveal the paradoxical doubling.

The texts showing the maximum number of **total coincidences** in this group are “The Secret Sharer,” *Despair*, and “The Two Actors”: {46,36,**51**,36,**51**,46,41,46,46**,51**,46,46,46} .

Here is another example of the quantitative research of the last remaining group we named “**mysterious attributes of doubling**” (Fig. 4)**.**

Horla

Wilson

Doppeltgänger

*Jekyll/Hyde*

Jolly Corner

Two Actors

**6**

Devil

**6**

Devil

**5**

Secret Sharer

*Despair*

Nose

Shadow

Schlemihl

Figure 4: Graph for “Mysterious attributes of doubling”

It is natural to suppose that the above list of attributes is not universal, neither is it comprehensive. One may come across some unusual and exceptional feature(s) of the doppelganger topos in some other texts. As for mathematics, it functions as a trigger or impetus for further literary analysis. Apparently, this approach does not provide a “complete and ultimate” proof of some preliminary hypothesis or theses. Still, it highlights the regularity or the uniqueness of phenomena and thus directs our searchlight to the curious points in the field of literary theory and comparative research.

Such gothic attributes of the doppelganger discourse as “dream,” “secret,” “mysterious (haunted) building,” “the supernatural,” and “signs of doom” bear the genetic traits of the “weird” fiction. The corresponding graph for this group (Fig.2) consists of the biggest number of edges as compared to those built for three previous groups. The “frontrunners” in this “mysterious” group are Dostoevsky’s *Double*, “The Two Actors”, both tales revealing **6** coincidences, and “The Devil. Ivan Fyodorovich's Nightmare,” showing **5**.

The same three texts are also leading in total coincidences: theirs are the best results, i.e. the highest numbers of coincidences in the discussed group of attributes:

{33,32,26,29,27,27,20,32,33,**36**,**35**,**36**,30}.

The fact that the same three texts are leading in both categories in relation to “mysterious attributes of doubling” must be due to the specific role played by **the demonic** alongside with other “weird” elements highlighted in them. The demonic manifestations in both Dostoevsky’s texts are mingled with psychopathological ones. As for Gautier’s short story, the Devil there does not show up in the protagonist’s delirium – instead he appears in the same manner as he does in Goethe’s *Faust*. The presence of Faustian subtext in “The Two Actors” is certainly not accidental.

**Conclusion**

We have four lists of fictions revealing strong similarity within each corresponding group of attributes:

1. “**The Secret Sharer**,” “Horla,”***The* *Doubl*e** and *The Strange Case of Dr. Jekyll and Mr. Hyde* within “the psychological attributes of doubling” group.
2. “**The Secret Sharer**,” “Der Doppeltgänger,” “The Shadow”, “The Nose”, “Horla,” “**The Two Actors for One Part**,” ***The Double***, and *The Strange Case of Dr. Jekyll and Mr. Hyde* within “the physical manifestations of doubling” group.
3. “**The Secret Sharer**,” *Despair*, and “**The Two Actors**” within “the elements of biography in doubling” group.
4. “**The Two Actors**,” “The Devil,” and ***The* *Doubl*e** within ‘the mysterious attributes of doubling’ group.

Only three of the above texts appear in three lists: *The* *Doubl*e, “The Secret Sharer,” and “The Two Actors.”

As has been noted, mathematical results worked as a trigger. In each case, they posed new questions. For instance, we may ask: Why did the above three texts, that are so much different, take the lead in the ‘doppelganger race’? How shall we explain their top position?

Apparently, Gautier, Dostoevsky and Conrad managed to develop almost universal doppelganger recipes by selecting the best working “ingredients” (attributes) and their effective combinations, the recipes that also worked well for other writers in case the latter intended to create the delirious and nightmarish atmosphere invariably present in doppelganger stories. A common feature for the three leading texts is the **intense communication** of the protagonist with his double,such close relation having a strong, if not fatal, influence on the former.

One can easily notice that *The Double*, “The Secret Sharer,” and “The Two Actors” represent different kinds of doubling. Gautier’s protagonist, unlike Golyadkin in Dostoevsky, has no symptoms of split consciousness. There is nothing specifically weird in “The Secret Sharer” unlike there is in the other two texts. There is no confrontation between Conrad’s characters either. Instead, the double of the captain assists him in his rite of passage (Benson,1962; Handke, 2010). Still, some mystery is present in Conrad’s text too. The mystery is maintained throughout the whole story based on the assumption that the lives of the captain and his secret companion are mystically connected.

While the double in Dostoevsky’s novella is the exact copy of Golyadkin, the devil in Gautier’s story has no resemblance to Heinrich, the ambitious actor. Their visual likeness is present in the theatrical space alone: the devil dresses up exactly as the actor playing his part. Unlike the two Golyadkins, the pair of Gautier’s characters are fake doubles. In fact, the plot of “The Two Actors” can be viewed as a **metatextual commentary** on art as mimesis. i.e. as reproduction and doubling of life.

The specific plot and tone of each of our three top texts manifest the multi-vector development of the doppelganger prose, the complexity and variability of the discussed topos. In each case, the set of selected attributes depends on a specific author’s intention. Still, the approaches of Gautier, Dostoevsky and Conrad appeared to be best suited for completely different artistic tasks. They created doppelganger plots to represent three different themes: **a)** demonic menace as the price for the actor’s gift (“Two Actors”), **b)** parallel experience of liminality by the Self and Other (“The Secret Sharer”); **c)** split-self and *alter ego* battle (*The Double*). It is worth noting that no text featuring twins or anthropomorphous automata came to the fore. Fictions based on metamorphosis or shapeshifting (like Stevenson’s Jekyll and Hyde tale) also faded to the background.

The best results shown by “The Secret Sharer” deserve some extra commentary. The appearance of Conrad’s ingenious short story manifested a new stage in the evolution of the doppelganger topos in the early 20th century. Though preserving the root traits, i.e. the indispensable attributes of the topos, Joseph Conrad was preoccupied with psychological rather than gothic suggestions. “The Secret Sharer” demonstrated that the double could do without fantasticality, that the doppelganger can overcome the limitations of the monster discourse. Following Conrad’s path, Vladimir Nabokov rejected gothicality and based his *Despair* on the ironic representation of traditional doppelganger clichés. Since then, authors delving into the mystery of the split-ego could do without the literary devices that were typical for the 19th century fantastic.

Finally, we want to emphasize what we believe is the most interesting outcome of the present research – the exceptionally high position occupied by Dostoevsky’s *Double.* Its **typicality** in relation to the doppelganger topos is due to the high total number of attributes revealed in all four groups: 9 out of 9 “psychological,” 3 “physical manifestations of doubling” (only “Two actors” have more), 5 “elements of biography in doubling” (a peak number for this group), and 3 (the group average) “mysterious attributes of doubling.” To sum up, *The Double* contains 20 attributes. Most importantly, the second stage of our quantitative research revealed the novella’s strong similarity in relation to a much more relevant parameter: *The Double* bears strong resemblance to numerous other doppelganger texts where the combinations of both present and absent attributes coincide. To conclude, Fyodor Dostoevsky’s *Double* proved to be typical both due to **the high total number of attributes**, and due to its **high similarity to other texts**. Such combination of qualities places *The Double* on the very top of the representative set of canonic doppelganger texts.

**Acknowledgement**

We thank Saint-Petersburg State University for its financial support through the grant **ID 94033710**.

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