

The Study of Character under the Application of Artificial Intelligence

-- Takes Ibn as an Example in "Desire under the Elm Tree"

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Abstract: Character analysis in drama is a core issue in drama research, performance teaching and drama creation. However, traditional character analysis methods mainly rely on textual close reading, dramatic criticism, and actors' practical experience, and lack objective and systematic quantitative analysis means. With the rapid development of Artificial Intelligence (AI) technology, especially the maturity of Natural Language Processing (NLP) and Emotion Computing technology, the use of AI means to analyze the character of drama is gradually becoming an emerging method in the field of drama research. Character classification is an important element in theater research, psychology and AI text analysis. Different disciplines have different approaches to character classification, and in theater research, character classification helps to understand character motivation, action logic, and their performance in dramatic situations. In AI analysis, character classification is usually done with the help of Natural Language Processing (NLP) and machine learning techniques to extract features from play texts and classify them. In this paper, through the interdisciplinary combination of artificial intelligence technology and dramatic character analysis, taking Ibn in Desire Under the Elm Tree as an example, we discuss how to utilize methods such as Natural Language Processing (NLP), Sentiment Analysis (Sentiment Analysis), and Social Network Analysis (SNA), to carry out the study of dramatic character from multiple perspectives such as textual features, emotional tendencies, and character relationships. Systematic research. Combined with traditional theories of drama, such as Stanislavski's Action Analysis, Freud's psychological theories, and modern personality classification models (Big Five Personality, MBTI, etc.), this study demonstrates the potential value of AI technology in drama research.

Keywords: Artificial Intelligence; Characterization; Expressionism; Desire Under the Elms; Eugene O'Neill.

1. The Core of Character Building -- Personality

Dramatic character personality (Character Personality) refers to the stable psychological characteristics, behavior and emotional tendency of characters in a specific situation.

The analysis of dramatic character traits is a core issue in drama studies, performance teaching, and dramatic creation. However, traditional methods of character analysis primarily rely on close reading of texts, dramatic criticism, and the practical experience of actors, lacking objective and systematic quantitative analytical tools. With the rapid development of artificial intelligence (AI) technology, especially the maturity of natural language processing (NLP) and affective computing techniques, using AI to analyze dramatic characters is gradually becoming an emerging method in the field of drama research.

In theatrical creation, creators typically enrich the works content and emotions by portraying characters. They focus on shaping character personalities through dialogue, behavior, thoughts, and feelings, complemented by external image design to present complete and authentic character images. Different personalities in works have distinct manifestations, making it easier for audiences to resonate and emotionally connect, immersing them in the world constructed by the drama and understanding its thematic content and emotional depth. Therefore, character personality development is an indispensable part of the theatrical creation process, serving as both the driving force of the plot and the foundation for emotional resonance, as well as the embodiment of the works

thematic ideas. The quality has an important impact. [1]

2. Character Classification

Character classification is a crucial aspect in dramatic studies, psychology, and artificial intelligence text analysis. Different disciplines employ varying methods for character classification. In dramatic studies, character classification aids in understanding character motivations, action logic, and their performance within the dramatic context. In AI analysis, character classification typically leverages natural language processing (NLP) and machine learning techniques to extract features from text and classify them.

2.1. Character Classification in Traditional Drama and Psychology

(1) Aristotles classification of tragic and comic characters

In his Poetics, Aristotle divides dramatic characters into two main categories:

Tragic characters (Tragic Characters): usually of noble status, who have a tragic fate due to their own defects (Hamartia), such as Hamlet, Othello.

- Comic character (Comic Characters): A character who causes laughter by exaggerating personality and absurd behavior, such as Shakespeares Falstaff.

(2) Stanislavskis character types

Stanney system focuses on the psychological logic of characters, and classifies dramatic characters according to the logic of motivation and action:

- Goal-oriented role (Purpose-driven Characters): Actions

are driven by clear goals, such as Ibn fighting his father to inherit the farm.

- Emotion-driven characters (Emotion-driven Characters): those who are dominated by emotions, such as Abis betrayal and destruction for love.

(3) Character classification in Freudian psychoanalysis

Freuds theory of personality divides the individual psyche into the Id (I), the ego (Ego), and the superego (Superego), which can be used to analyze the character of a dramatic figure:

- Id-dominant: driven by desire, such as Aby in *The Desire Under the Elms*.

- Self-type (Ego-dominant): a balance between reality and desire, such as Ibns inner struggle.

- Superego-dominant (Superior): Follows social ethics, such as Ibns father, Capt.

(4) Jungs Archetypal Personality (Archetypes)

Jung believed that personality could be summed up in several psychological archetypes, which are common in drama, mythology and literature:

- Hero (Hero): Has a growth process, like Hamlet.
- Sage (Sage): provides wisdom, such as the witches in *Macbeth*.

- Rebel (Rebel): To defy authority, such as Ibn challenging his father's authority.

Tragic lovers (Tragic Lover): Love tragedy, such as Abi.

2.2. Personality Classification Model in Modern Psychology

(1) Big Five personality (Big Five Personality Traits)

The most commonly used personality classification model in modern psychology is the "Big Five Personality" (OCEAN model), which includes:

- Openness (Openness): curious, innovative, willing to accept new things.

- Responsibility (Conscientiousness): responsible, diligent and goal-oriented.

- Extroversion (Extraversion): active, social, and oriented to the outside world.

- Agreeableness: Kind, tolerant, easy to work with others.

- Neurotic (Neuroticism): anxiety, instability, mood swings.

For example, in "*Desire Under the Elm*," Ibn may have the characteristics of high neuroticism, low agreeableness, and high conscientiousness.

(2) MBTI personality classification

The MBTI (Myers-Briggs Type Indicator) divides personality into 16 types and is often used in character analysis:

- Introverted (I) vs. Extroverted (E)

- Intuition (N) vs. Reality (S)

- Emotion (F) vs. Rationality (T)

- Judgment (J) vs. Perception (P)

For example, Ibn may be INFJ (idealist type), with an inward emotional world and strong goals.

2.3. Application of Artificial Intelligence in the Classification of Dramatic Character Personality

Artificial intelligence can classify the personalities of dramatic characters through **natural language processing (NLP) and machine learning (ML)** , including:

- Text sentiment analysis (Sentiment Analysis): Judging the emotional tendency of a character's lines (positive/negative/ neutral).

- Keyword extraction (TF-IDF): statistics on the high frequency of words used by characters to infer personality traits.

- Semantic analysis (BERT, GPT): recognize the language style and thinking mode of characters, and match the psychological personality model.

- Social network analysis (SNA): analyze the social interaction of characters in the play, judge their extroversion, leadership, etc.

For example, using AI to analyze Ibns lines, it can identify that he is more emotionally anxious (high neuroticism), more likely to talk about family conflicts (low agreeableness), and has clear goals (high conscientiousness).

There are numerous methods for categorizing character personalities, ranging from traditional dramatic theory to modern psychology and AI analysis, each with its own focus. In dramatic studies, combining psychological classification with AI data analysis can provide a more comprehensive perspective on character personality research. For example, when studying Ibn, one can use the Big Five personality model for psychological analysis, while simultaneously employing NLP technology to analyze the emotional nuances of his lines, thus forming a new method of dramatic character research that integrates quantitative and qualitative approaches.

2.3.1. The Shaping of Ibns Character by the Background of the Plot

Ibn grew up in a family full of patriarchal oppression and conflicting desires:

- Patriarchal repression: Father Caputo (Ephraim Cabot) is a cold and unfeeling landlord, and his authoritarian personality makes Ibn lack fatherly love from an early age and hate his father.

- Loss of motherhood: The death of his mother had a profound impact on Ibn, making him obsessed with the legacy of his mother (the farm) and longing for an emotional replacement.

- Conflict between emotion and desire: When Abi (Abbie Putnam) enters the family as a stepmother, Ibns psychological experience changes from rejection and desire to conflict and tragic rupture, showing complex emotional fluctuations.

2.3.2. Character Analysis under Stanislavski System

According to the action analysis method (Action Analysis), the action logic of Ibn can be summarized as follows:

1. Goal: Take back the farm from my mother and maintain my sense of belonging.

2. Main obstacles: fathers authority, stepmother Abis intervention.

3. Action strategy: From verbal confrontation and emotional entanglement to the final tragic ending, his behavior is adjusted according to the change of his psychological state.

From the perspective of psychological realism, Ibn shows a strong inner conflict:

- He is both eager for freedom and bound by his promise to his mother;

He loved Abi and was tormented by the moral taboo of incest.

Freudian psychoanalysis

If analyzed from the perspective of id-ego-superego (Id-Ego-Superego):

- Id (Ib): Ibens subconscious is filled with sexual instincts and a desire for revenge. His attraction to Aby is intertwined with his mother complex.

- Self (Ego): In his relationship with Abi, he struggles between love and morality, hesitating whether to accept her feelings.

The superego (Superego): After realizing that Abi killed the child, Ibns guilt overwhelmed his id, and he finally chose to turn himself in and accept social punishment.

2.3.3. Analysis of Ibns Personality by AI Technology

Modern artificial intelligence can analyze Ibns personality from the dimensions of language style, emotional expression and social relationship through text analysis, emotional computing and social network analysis

Natural Language Processing (NLP) analysis

(1) Keyword extraction and word frequency analysis

AI can extract high-frequency words from Ibns lines through TF-IDF (term frequency-inverse document frequency), and then analyze his personality characteristics. For example:

- Possible high-frequency words: "mother", "farm", "hate", "love", "Abe", "father", etc., reflect his persistence in family, hate and love.

- Language style: Use more negative emotion words (anger, sorrow, regret) to indicate the angry and tragic characteristics of his personality.

(2) Sentiment analysis (Sentiment Analysis)

Based on the **emotional dictionary (Sentiment Lexicon) ** or deep learning models (such as BERT, GPT), the emotional tendency of Ibn in different scenarios can be analyzed:

- Anger (Anger): His speech is more aggressive when facing his father, and the emotional analysis may be biased towards the "anger" category.

- Anxiety (Anxiety): His words may contain hesitation and contradiction when developing a relationship with Abi, and his emotions are classified as "anxiety" or "guilt."

- Sadness (Sadness): After learning of the child's death, his lines tend to fall into the sadness category.

Example: AI analysis result (assumption):

- Overall emotional distribution of Ibns lines: anger 40%, anxiety 30%, sadness 20%, happiness 10%.

- Emotions change with the plot: from "anger (conflict with father)" to "anxiety (falling in love with Abi)" to "sadness (learning of the baby's death)".

2.3.4. Social Network Analysis (SNA)

(1) Visualization of Ibns social network

Using graph theory (Graph Theory), Ibns social network can be drawn to analyze his interactions with other characters in the play:

- Centrality (Centrality) analysis: Ibns number of lines and frequency of dialogue show that he is a core character.

- Character relationship: He has the most conversations with Abi and his father, and the most emotional fluctuations, showing his key position in the dramatic conflict.

(2) Emotional transmission between roles

Using the affective communication model (Emotion Propagation), we can analyze how Ibns emotions are influenced by others and situations. For example:

- Father → Ibn: Antagonistic emotions (conflict)

- Abi → Ibn: initial resistance → passion → contradiction → despair

These data can quantify the flow of emotions in a play and help understand character development.

3. The Combination of AI Analysis and Traditional Drama Analysis

Analysis method conclusions

Stanislavskis action analysis --Ibn has a clear goal and his action is influenced by inner conflict

Freudian psychoanalysis --Ibn is driven by the "Oedipus complex" and has intense emotional struggles

NLP keyword analysis --The language is biased towards "revenge, anger, anxiety", indicating an unstable personality

Emotion analysis --The emotion is based on "anger-anxiety-sorrow"

Social network analysis --Roles play a central role in family conflict and have a strong influence.

4. Conclusion

Drama, as a unique form of stage art, not only provides immediate aesthetic enjoyment but also provokes long-term reflection and discussion among audiences, conveying spiritual and cultural significance. By shaping character personalities, drama can unfold storylines and convey the values, morals, and worldviews specific to particular cultural contexts, achieving cultural inheritance and the transmission of the essence of theatrical works. Through the creation of a series of vivid characters with distinct personalities, drama effectively communicates the cultural values of frugality, honesty, and integrity, making significant contributions to promoting fine traditional Chinese culture and fostering cultural prosperity. [1]

This paper explores the interdisciplinary integration of artificial intelligence technology and character analysis in drama, using Ibn from "Desire Under the Elms" as a case study. It examines how methods such as natural language processing (NLP), sentiment analysis (Sentiment Analysis), and social network analysis (SNA) can be applied to systematically study the character traits of dramatic figures from multiple perspectives, including textual features, emotional tendencies, and role relationships. By combining traditional dramatic theories, such as Stanislavskis action analysis, Freudian psychological theories, and modern personality classification models (such as the Big Five and MBTI), this study highlights the potential value of AI technology in the field of drama research.

Research has found that Ibns character exhibits intense inner conflicts in the dramatic text, with his emotional speech primarily revolving around anger, anxiety, and sadness. The text analysis by AI further quantifies these emotional traits and reveals how they evolve with the plot development. Meanwhile, social network analysis indicates Ibns central role in the dramatic conflict, as well as how his interactions with his father and Aby influence his character formation.

This study not only provides an innovative method combining quantitative and qualitative approaches for character analysis in drama but also offers new insights for future teaching of dramatic performance, playwriting, and AI-driven drama analysis. However, the application of AI in character analysis in drama still has limitations, such as insufficient understanding of metaphors and symbolic meanings, and the need for more refined emotional analysis. Future research could integrate multimodal data (text, speech, facial expressions, etc.) to further enhance AIs ability to understand dramatic characters, providing more precise technical support for dramatic performance and education.

References

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