Examining the Communication Effectiveness of Artificial Intelligence Art Personification

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Abstract

Artificial intelligence (AI) art is an emerging product of the computer age, and AI artworks now have distinctive personalities. Based on the theoretical perspective of "anthropomorphic communication", this paper uses a combination of computational visual technology and manual coding to analyse the visual content of 40 AI artists' works and explore the communication effects of anthropomorphic AI art. Based on the findings and AI art generation techniques, a qualitative analysis of the factors affecting the degree of difference in anthropomorphism was conducted, and a network diagram of the influencing factors was generated. The findings revealed that AI has an "anthropomorphic effect" on visual art, triggering emotional empathy and relational identification with the audience. It is worth emphasising that the anthropomorphism of visual language symbols and spatial presentation significantly enhances the communication effect, but the difference in the degree of anthropomorphism does not significantly affect the communication effect. The research findings complement and enrich theories of visual language space, the semiotic theory of visual art and the theory of humanising trends in media. It enhances the understanding of existing artefactual art. And it inspires visual art creators to integrate real-time hotspots, history and culture in the process of innovative practice, to follow the laws of media evolution, and to enhance communication power and influence through visual symbols.

Keywords: Visual Culture, Communication, Effectiveness, Artificial Intelligence, Art, Personification

Literature Review

Personal communication and visual symbol production

Personification refers to the process of giving personality characteristics to inanimate objects, abstract things and nature, forming the operation and transmission of thoughts (Gray, H., & Gray, K., 2007). The transmission of personality refers to the transmission of the full expression of self-attributes, including visual and verbal symbols (Stewart, 1990).

Different from interpersonal communication, in the communication activities based on media technology, personalization is different in macro and micro aspects. In macro aspect, media humanization is the main feature, while in micro aspect, the main feature is the symbolization of communication. As far as the humanization of media is concerned, the emergence of media technology by computer technology has developed a vision generation model that is more and more in line with human needs and human-like, which is the objective basis for realizing more effective personification communication.

In the communication process of visual art works, visual symbol is the basic unit of personal communication, and the personification of visual symbol is the external representation of the communication process. By means of narrative, symbols express everything through the senses. The implementation of personified communication depends on specific media technology, and different media subjects adopt different communication symbols, thus presenting different "personality characteristics" (Jung, 2017).

Research shows that the use of visual symbols in communication is different in different media platforms, which leads to differences in the degree of personification. In traditional print media, such as newspapers and magazines, visual symbols are often static and lack

personalization. Photographs and illustrations in these mediums often aim to capture the essence of the subject or object, rather than giving them distinct personality traits (Jia, 2014)

In contrast, in television and film, visual symbols are more dynamic and can be highly anthropomorphic. Through the use of cinematography techniques, lighting, and expressive facial expressions, characters in visual media are often portrayed with specific personality traits that enable the viewer to connect with them on a more personal level. The movements, gestures, and body language of characters in visual media further contribute to their personification as they exhibit individuality and unique patterns of behavior (Schill, 2012).

In the realm of digital media and social networking platforms, where AI art primarily circulates, visual symbols experience another level of anthropomorphism. Emojis, avatars, and avatars allow individuals to represent themselves with customized visual representations that reflect their personality, interests, and emotions. This form of self-expression through visual symbols adds a layer of personalization to the communication process, creating a sense of individuality and uniqueness.

In general, compared with the era of mass communication, the subject of personification communication in the era of new media is more abundant, extending from natural persons to symbolized "virtual spokespersons", and paying attention to the all-round personification of communication symbols in content production. The rise and development of artificial intelligence art requires us to analyze the law of personification communication from a more comprehensive and microscopic perspective. Therefore, this paper focuses on the micro dimension of communication symbol personification to explore the phenomenon of personification in artificial intelligence art, and defines personification communication as: real or virtual media art mainly uses personified visual symbols, supplemented by language symbols, a

content presentation strategy to shape the image of media subjects, the core of which is to highlight "personality characteristics" in the process of communication.

Quantitative analysis of visual symbols based on computational propagation method

In this study, computational vision technology is introduced into the content analysis of artificial intelligence art, and the production characteristics and effects of its personified symbols are measured more comprehensively and objectively. In terms of method category, computational vision technology can be classified as computational communication, and its analysis object is online massive visual images. In recent years, the development of computational vision technology provides a technical guarantee for the analysis of non-verbal symbols, especially visual symbols.

The combination of computational vision method and communication science was earlier used to study the visual bias of political candidates, and the communication effect of media content under different visual symbols was evaluated by crowdsourcing coding, and it was found that certain visual features could affect the audience's perception (Grabe& Bucy, 2009). In addition, the retention of network behavior data provides a more direct data source for audience behavior and communication effect, and it has become possible to carry out research on artificial intelligence content and communication effect by means of computation.

In short, the discussion on the characteristics and effects of artificial intelligence art personification communication has practical significance, theoretical value and technical operability. On the one hand, previous research on personified communication often lags behind media practice and lacks scientific research methods, so it belongs to the phenomenon level and lacks empirical research on its communication effect. On the other hand, with the emergence of new media communication characteristics such as fragmentation, socialization and

emotionalization, the research on personalization communication should turn to a more comprehensive, micro and audience-oriented logic and perspective, so as to explore its internal mechanism and test its theoretical value, which is also the breakthrough of this paper.

Theoretical Background and Hypotheses

The research object of this paper is the artificial intelligence-generated art works of 40 artists. This study takes the communication effect as the dependent variable; The personification of communication symbols is taken as the independent variable (including the personification of linguistic symbols and the personification of visual symbols). The selection basis and research hypothesis of specific indicators are as follows:

Language sign personalization

Language sign is the unity of signifier and signified, as well as the unity of content and form. The language symbols in this paper include two categories: "use of style" at the content level and "language style" at the form level. Style refers to language varieties formed to meet different communicative needs. New media buzzwords themselves are stylistic; Language style refers to the comprehensive performance of various characteristics in speech practice, specifically in this paper, it is the comprehensive characteristics and style of the content description of exponential word generation works using language.

Some studies have shown that the personalization of language signs can improve the communication effect. Media use part of the network online slang to effectively enhance interactive behavior (Zhang & Xu, 2016), whether the language style has affinity is also closely related to the communication effect. Therefore, this paper takes stylistic and stylistic personification as two indicators to measure the degree of personification of language signs, and puts forward the first research hypothesis:

H1: The higher the degree of language symbol personification of artificial intelligence art works, the better the communication effect.

H1a: The higher the degree of stylistic personification of artificial intelligence art works, the better the communication effect.

H1b: The higher the degree of language style personification of artificial intelligence art works, the better the communication effect.

Personification of visual symbols

The visual symbols related to characters mainly fall into two categories: "body language" and "spatial presentation". The former refers to the posture and action that the characters use intentionally or unintentionally in reality, including posture language, sign language and facial expression. The latter refers to the presentation form of the subject space by the media. This paper mainly includes two indicators: "visual Angle", "Spatial shapeand" and "lens distance".

It has been found that the personalization of non-verbal signs can improve the communication effect. The spatial presentation of the media to the communication object will also affect the communication effect, and the proximity of the lens distance can often enhance the visual affinity of the characters (Dreyfuss, 1970). Therefore, "the personification of spatial presentation" is taken as another index to measure the personification of non-verbal symbols.

To sum up, this paper takes body language, including expression, gesture and head posture, and spatial presentation, including lens distance and picture direction, as indicators to measure the degree of personification of non-verbal signs, and puts forward the second research hypothesis:

H2: The higher the degree of visual symbol personification of artificial intelligence art works, the better the communication effect.

H2a: The higher the degree of body language personification of artificial intelligence art works, the better the communication effect.

H2b: The higher the degree of spatial personification of artificial intelligence art works, the better the communication effect.

In addition, different themes will objectively affect the communication effect, so this study takes the video theme as the control variable. As variables that may affect the communication effect, the age, gender and video duration of anchors are also included in the control variables.

Method

Data collection

This study selects 40 works of 40 artists with the highest total value of AI artworks as research objects, and the analysis unit is each work. This study uses python code to capture short video data from January 2, 2021 to January 2, 2023. The main fields captured are "title", "price" and "transaction address". A large number of duplicate, irrelevant, or undownloadable AI artwork data were eliminated when selecting cases. According to the media nature of the account, a total of 8 art galleries with the most sales at different levels were selected. Art Blocks, Nifty Gateway, SuperRare, Foundation, hic et nunc, Async Art, KnownOrigin, and MakersPlace. A total of 10,000 pieces of data, total sales of 1,156,159.725 ETH, total sales of art 3,936,487. This study focuses on the top 40 artists with significant influence, and the following 40 AI artworks (see Table 1) are all included in the sample.

Table 1

Description of characteristics of artificial intelligence artwork samples

Transaction Address	Frequency	Percent (%)
Art Blocks	2	5

Transaction Address	Frequency	Percent (%)
Foundation	3	7.5
Nifty Gateway	3	7.5
SuperRare	1	2.5
Art Blocks	12	30
Async Art	2	5
Foundation	2	5
MakersPlace	2	5
Nifty Gateway	4	10
Phillips	1	2.5
Sotheby's	3	7.5
SuperRare	5	12.5
Total	40	100

Variable measurement

The personification of communication symbol is the independent variable of this paper, which is divided into linguistic symbol personification and visual symbol personification. The dependent variable is the communication effect, measured by the turnover of each work. The communication effect of artificial intelligence works is mainly reflected in the audience's purchase, comment and sharing. Compared with the comment and sharing behavior, the purchase behavior more means the identification of the content, so the number of married people is chosen

as the criterion to judge the communication effect. The operational definition and measurement methods of variables are shown in Table 2.

Table 2

Operationalized definitions and measurement methods of main variables

		Name		Definition	Variable Type	Measurement Method
Independent variable	Language Symbol	Personification of Language		It refers to whether popular language, colloquialisms, and slang are used in the compilation of artificial intelligence artworks.	Ordinal	0-Low degree of linguistic personification 1-High degree of linguistic personification
		Personification of Language Style		It refers to the primary language styles personified in artificial intelligence artworks include seven categories.	Ordinal	0-Low degree of linguistic stylization 1-High degree of linguistic stylization
Independent variable	Visual symbols	Bodily posture and personification	Facial expressionless	Facial expression/emotional richness Number of different facial expressions/emotions, with a higher number indicating a higher degree of personification.	Scale	The degree of embodiment in body language = richness of facial expressions/emotions + rate of dynamic appearance
			Degree of dynamism	The presentation mode of AI art can be dynamic or static. The higher the occurrence of dynamic presentation, the higher the degree of personification.	Nominal	0-Static 1-Dynamic
		Name		Definition	Variable Type	Measurement Method
Independent variable	Visual symbols	Spatial presentation and personification	Spatial shape	Number of geometric shapes in space, the higher the quantity, the higher the degree of personification.	Scale	Mean ratio of the number of shapes to the size of the canvas

		Visual Angle	It refers to the angle of the subject. The more varied the angles of the subject, the higher the degree of personification.	Ordinal	Degree of spatial personification = Richness of visual angles + Richness of camera distances
		Lens distance	It refers to the size of the scenery, there are five types, and the closer the distance, the higher the degree of personification.	Ordinal	
	Name		Definition	Variable Type	Measurement Method
Controlled variable	Content theme		Category/theme affiliation	Nominal	1-Abstract Expression 2-Natural Themes 3-Figurative Representations 4-Technological Themes 5-Social Issues 6-Cultural Diversity 7-Imagination and Fantasy
	Color palette		Number of theme colors	Scale	Artificial encoding
Dependent variable	Communication effect		Transaction amount	Scale	Artificial encoding

Coding and Reliability Test

This study employed a combination of automated coding using visual technology and manual coding to complete the coding process.

Automated Coding using Visual Technology. Face++ and Baidu AI platforms were utilized for facial recognition and language sentiment analysis of the image dataset, primarily focusing on facial expressions. A total of 900 image data were obtained, and after excluding images with undetected faces, 720 valid data remained.

Manual Coding. Based on the research hypothesis, manual coding was conducted for language style personification, language style personification, visual angles, camera distances,

and content themes. Language style personification primarily measured the use of popular phrases, slang, or colloquialisms in the videos. Language style personification measured the narrative style of the media discourse, including seven categories (see Table 2). Visual angles included frame size and perspectives, such as long shot, panorama, mid shot, close-up, and extreme close-up. Content themes measured the thematic categories of different reports, including Abstract Expression, Natural Themes, Figurative Representations, Technological Themes, Social Issues, Cultural Diversity, Imagination, and Fantasy.

Two coding experts in the field of communication completed the video text coding task. The videos were converted into text using a third-party platform, and manual verification was performed to ensure the accuracy of the text. The coding process followed the steps of pilot coding, consistency test, coding adjustments, and resolution of discrepancies. Initially, both coders independently coded the text of 40 art pieces, and the preliminary coding categories were established. The number of consistent codes was 37. Based on the actual situation, the coding categories were adjusted, and after recoding, the Cohen's Kappa value showed a high level of intercoder reliability with a value for the main variables.

Data Analysis. This study primarily employed multiple linear regression analysis. Transaction amount was treated as the dependent variable, while language style personification, language style personification, body language personification, and spatial presentation personification were treated as independent variables. Color and content themes were controlled variables. Since categorical variables existed among the independent variables, the corresponding number of dummy variables were created first, and tests for multicollinearity and model fit were conducted.

Results

Descriptive Analysis of Key Variables

Language Symbol Personification 1. Regarding language style personification, there were 27 videos that used personified language style, while 13 videos did not, indicating that 67.5% of the short videos employed a more personified language style. In terms of language style, the main language styles were Formal, Poetic, Humorous, Narrative, Stern, Mysterious, and Experimental. A total of 32 videos utilized personified language styles, accounting for 80.0% of the total sample.

Visual Symbol Personalization 2. According to the descriptive statistics (Table 3), there is significant variation in the degree of body language personalization among the forty artificial intelligence artworks. Specifically, there is substantial variation in the richness of facial expressions/emotions across different artworks, with an overall moderate-to-high level of emotional intensity. Dynamic artworks are relatively less common compared to static artworks. Among the three indicators of spatial presentation personalization, the majority of AI artworks contain more than three types of visual shapes. The distances are generally close but exhibit some differences. In terms of visual angles, 62.5% of AI artworks have rich and diverse visual perspectives.

Transaction Amount 3. The average transaction amount of the sample AI artworks is 380,682.56, with a median of 88,888.88. These values are relatively large, and 55% of the values are greater than or equal to the mean, indicating a relatively dispersed distribution. This suggests significant variations in the dissemination effects of these AI artworks. Therefore, further analysis needs to take into account the dependent variable.

Table 3

Descriptive Statistics of Visual Symbol Personalization in Sample AI Artworks

	Mean	Std. Deviation
Facial expressionless	2.83	1.01
Degree of dynamism	0.28	0.452
Spatial shape	3.2	1.556
lens distance	2.48	1.176
visual Angle	0.62	0.49

The Impact Analysis of Personalized Symbols on Dissemination Effects

Table 4

Regression Analysis Results of Personalized Symbols and AI Artwork Dissemination Effects

Variable	Standardized Coefficients Beta	t	Sig.
Language Symbol			
Personification of Language	0.252	2.083	0.046
Personification of Language Style	0.015	0.073	0.942
Visual symbols			
Facial expressionless	0.003	0.017	0.986
Degree of dynamism	-0.215	-1.709	0.098

Spatial shape	0.279	2.245	0.032
Lens distance	0.385	2.018	0.053
Visual Angle	-0.284	-2.269	0.031
Covariate			
Content theme	0.201	1.395	0.173
Color palette	0.11	0.855	0.399

According to the regression analysis results, among the 40 AI artworks, the use of personalized symbols has a certain degree of influence on dissemination effects. Specifically, the effects of language symbol personalization and spatial presentation personalization are particularly significant, while body language personalization does not yield the expected results.

Firstly, language symbol personalization significantly enhances the dissemination effects in mainstream media, confirming H1a. The personalization of language style significantly increases the number of likes for videos (B Language Personalization = 0.252, p Language Personalization < 0.05). The use of popular internet slang or idioms positively influences the dissemination effects (H1a). However, language style personalization does not have a significant impact on AI artworks' dissemination effects.

The impact of non-verbal symbol personalization on dissemination effects also exhibits variations. On one hand, personalized spatial presentation methods yield favorable dissemination effects, confirming H2b. Specifically, spatial shape significantly enhances the transaction amount (B Spatial Shape = 0.279, p Spatial Shape < 0.05), and artworks with rich visual angles have better dissemination effects (B Visual Angle = -0.285, p Visual Angle < 0.05). On the other

hand, contrary to the conclusions of most existing studies, the personalization of body language, represented by facial expressionlessness and degree of dynamism, does not have a significant impact on enhancing dissemination effects (B Facial Expressionlessness = 0.003, p Facial Expressionlessness > 0.1) (B Degree of Dynamism = -0.215, p Degree of Dynamism > 0.05), refuting H2a. Additionally, among the control variables, the theme content and color do not have a significant impact on AI artwork's dissemination effects.

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