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Perception dynamics of audience towards AI Anchor in China

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Abstract: Since its creation in 1956, artificial intelligence (AI) has significantly impacted various industries. A key milestone of AI's entry into the broadcasting and audiovisual media sector is the development of AI news anchors. In recent years, AI anchors have seen substantial growth in China. However, research on audience experience with AI anchors remains limited. This study aims to explore which characteristics of AI anchors affect audience experience.Using user experience theory, the study examines sensory, content, functional, and interactive experiences of AI anchors as independent variables, with perceived usefulness and perceived enjoyment as mediators, and audience evaluation as the dependent variable. Data from 765 valid questionnaires were analyzed using structural equation modeling.The results show that sensory, content, functional, and interactive experiences are positively correlated with perceived usefulness and enjoyment. Both perceptions are linked to overall audience experience, though content experience, interaction, enjoyment, and audience evaluation show weaker correlations.These findings offer valuable insights for the development and application of AI anchors and provide a data foundation for future research in this field.
Keywords: *AI anchors, Audience experience, Chinese, Questionnaire survey.*

1. Introduction

Since the summer of 1956, when McCarthy and other scientists initially introduced the concept of "artificial intelligence" (AI) at a conference hosted at Dartmouth College in the United States, AI has found extensive applications across various societal domains, significantly impacting people's lives. Particularly in recent years, the introduction of large-scale AI models has underscored the swift progress of AI technology in both social production and daily life. This development has not only motivated numerous scientists and researchers to explore more efficient ways of implementing AI but has also prompted them to be prepared for the challenges it may present at any given moment.

The early integration of AI technology in the media industry is exemplified by the utilization of intelligent distribution and algorithmic recommendation services in social media platforms, leading to enhanced audience engagement. A notable indication of the amalgamation of AI technology with audiovisual media, such as radio and television, is the introduction of AI anchors, which have emerged as a novel tool for linguistic communication in the audiovisual domain. Traditional radio hosts and presenters are products of the industrialized era of the radio and television sector. The introduction of "AI anchors" in radio hosting has amalgamated roles such as journalists, radio hosts, and presenters, transforming them into digital "spokespersons" for information dissemination. This signifies the progressive technological and industrial evolution of the roles of radio hosts and presenters [1]. On November 7, 2018, during the Fifth World Internet Conference, China's state news agency Xinhua News Agency and Sogou jointly unveiled the world's first synthetic news anchor possessing capabilities equivalent to those of a human anchor, developed using cutting-edge AI technology. According to He

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[1] AI anchors are AI-generated visual representations or products designed to resemble real humans through various AI techniques such as text-to-speech conversion, natural speech synthesis, facial key point extraction, lip reading, image recognition and synthesis, emotion transfer, and other multimodal information modeling and training. Presently, the utilization of AI anchors in China surpasses that in other countries, making this study focus on the prevalence of AI anchors in China.

The research in this field commenced with the historical development of AI news anchors and their applications in the industry [2]. The impact of AI anchors on audience media consumption has been a persistent topic since their introduction. As early as 2000, Tian Zhongchu deliberated on the potential replacement of human anchors by AI anchors, highlighting that the emergence of virtual hosts would primarily prompt media discussions on audience competition. Owing to technological constraints, virtual humanoid anchors lack human-like qualities, which may hinder long-term acceptance by audiences [3]. Some scholars argue that current AI news anchors are limited to generating and disseminating basic, mechanized, and repetitive information, lacking the capacity for engaging in human creative endeavors. Despite the current technological constraints that prevent deep involvement in creative news production, public sentiment towards AI news anchors remains largely favorable [4].

After the introduction of virtual digital humans utilized in audiovisual media applications, the audience's assessment of AI anchors plays a crucial role in the success of launching and refining this AI technology product. Despite various studies conducted by researchers on the influence of AI anchors on audience media consumption, there appears to be a noticeable gap in comprehensive research on audience receptiveness towards AI anchors. This study aims to investigate the specific factors that impact the audience's interaction with AI anchors.

This study presents the concept of user experience as a tool for evaluating the efficacy of novel technological products or services. Through the development of a framework aimed at assessing user experience with AI anchors, a survey involving 765 participants in China was conducted to pinpoint the factors and variables that impact users' interactions with AI anchors. The primary objective is to furnish AI anchor research and development teams, as well as media users, with empirical data to enhance their products and services, and to establish a basis for future investigations by other scholars.

2. Literature Review and Research Hypothesis

2.1. Literature Review

Since the emergence of AI anchors, research on the impact they have on audiences in the media consumption process has been ongoing. However, it is only in recent years that researchers have started examining audience experiences with AI anchors using various research methods. Some scholars have investigated the cognitive, attitudinal, and behavioral effects of AI anchors on audiences based on audience characteristics. Findings indicate that AI anchors exhibit rapid dissemination speed and broad coverage, with the highest level of awareness observed among young individuals [5]. Other researchers have utilized EEG technology to investigate the psychological perception and brain effects of different speech speeds (1.0x, 1.5x) on audiences of different genders using synthetic voice news products. Results suggest that audience preference for speech delivery is not associated with speech speed but is linked to gender Yu, et al. [6]. Wang and Han [7] discovered through online experiments that the more closely virtual news anchors resemble humans in appearance, behavior, and language habits, the more likely they are to elicit positive emotions in users, thereby enhancing user acceptance, willingness to use, and willingness to watch. Users favor virtual news anchors that resemble humans, and different gender virtual anchors are anticipated to have distinct applications. Xue, et al. [8] employed experimental methods to investigate audience perceptions of the attractiveness of AI news anchors and to explore audience willingness to watch this type of anchor. The study concludes that the appearance, gender, and voice of AI news anchors significantly influence the perceived attractiveness of these news anchors by the audience. Audiences prefer virtual news anchors with female appearances and anthropomorphic voices. Furthermore, the research revealed that the virtual image of AI news anchors is more appealing and popular among audiences than real human AI news anchors. Under the inherent cognitive regulation of traditional news anchors, audience willingness to watch AI news anchors has declined. In summary, while quantitative empirical research has concentrated on specific characteristics or functional performances of AI anchors, there is a noticeable dearth of investigation and research on the motivation of audience impact on the overall experience of AI anchors, as well as a lack of systematic research on audience application experiences with AI anchors.

2.2. Theory of User Experience

The term "user experience" has its roots in the design principle of "human-centered" within the realm of human-computer interaction. It gained prominence through the efforts of user experience designer Donald Norman in the mid-1990s Norman [9]. Bentley, et al. [10] posits that user experience comprises three key elements: emotion, performance and satisfaction, with the latter two closely aligned with usability. Daniel [11] suggests that user experience encompasses the behaviors, thoughts, and emotions that users exhibit while engaging with a product or service. Hassenzahl and Tractinsky [12] and others view user experience as a technology that fulfills user needs and enhances product design through a subjective, situational, complex, and dynamic interaction involving users' internal emotions, product design attributes, and usage context. The most influential definition of user experience, as outlined in ISO 9241-210, describes it as the cognitive and emotional processes users undergo when interacting with products or services, encompassing their feelings throughout the entire interaction. This definition underscores that user experience is influenced by the system, user, and usage context. Building on the perspectives of the aforementioned scholars, this study defines user experience as the subjective feelings and satisfaction that users experience during their interactions with the products or services they utilize.

The significance of user experience in the realms of commercial consumption and design has been increasingly emphasized. Consequently, research on user experience has been continuously deepening, resulting in the development of a series of foundational theories on the subject Roto and Rautava [13]. Csikszentmihalyi and Csikszentmihalyi [14] from the perspective of the immersion theory, posits that the state of flow induced by complete concentration represents the highest quality of user experience. Conversely, the theory of situational experience suggests that experiences entail a certain level of interactivity. Different experiential contexts lead to variations in the types of user experiences. Real-world environments tend to prompt users to provide more practical feedback on products, such as identifying product strengths and weaknesses. In contrast, user experiences in virtual environments generally exhibit a certain degree of positivity [15]. The theory of utilitarian hedonism argues that products not only offer utility value but also reflect the intrinsic value of their users, such as their identity and status. Consequently, user experiences can be categorized into two main types: utilitarian experiences and hedonic experiences. The functionality of products is closely linked to the functional experiences of users, while hedonic experiences are characterized by the inner feelings and emotions of users, ultimately aiming to enhance users' self-worth [16].

As a theoretical framework utilized for examining the user experience of novel technologies or products, numerous researchers employ it to assess the efficacy of applications and user experience of AI products. In her study, Parish [17] explored how AI enhances user experience by employing personalized user interfaces, automating repetitive tasks, and identifying behavioral patterns. Adam, et al. [18] delved into the impact of AI chatbots with personalized design cues in customer service settings on user compliance. The findings suggest that imbuing AI systems with human-like characteristics can heighten user engagement and satisfaction. Peruchini, et al. [19] conducted a systematic review on the utilization of user experience theory in AI products across various domains. The review offers insights into commonly utilized methodologies and frameworks for evaluating the efficacy of AI technology, underscoring the significance of integrating user experience in AI product design to enhance user satisfaction and engagement. Collectively, these studies advocate for the applicability and relevance of user experience theory in assessing the user experience of AI products. Consequently, this study advocates for the incorporation of this theory in the development of research frameworks and measurement scales.

2.3. Research Framework and Research Hypotheses

In the realm of user experience research, various models have been proposed by researchers. Moeslinger [20] identified sensory experience, emotional experience, and practical experience as the primary components of user experience. Additionally, situational factors were noted to have an impact on user experience, indicating that changes in the usage environment can alter the overall user experience even when the individual user and product service quality remain constant. Rubinoff [21] and others suggested that user experience components encompass usability, functionality, content, and brand. Anderson [22] and colleagues categorized user experience into five aspects based on user needs: usability, reliability, ease of use, functionality, and entertainment, with functional needs being the most critical in user experience. Hassenzahl, et al. [23] introduced a key elements model of user experience from the user's perspective, emphasizing that users initially perceive product characteristics such as functionality, content, visual, and interaction. Subsequently, users construct their unique perceptions of product attributes based on these characteristics, including utilitarian and hedonic attributes. Emotional judgments are then made based on these perceived attributes, influencing the product's appeal or eliciting behavioral responses. It is important to note that users' evaluations are also influenced by the usage context, indicating that identical product attributes may not consistently lead to the same evaluation outcome.

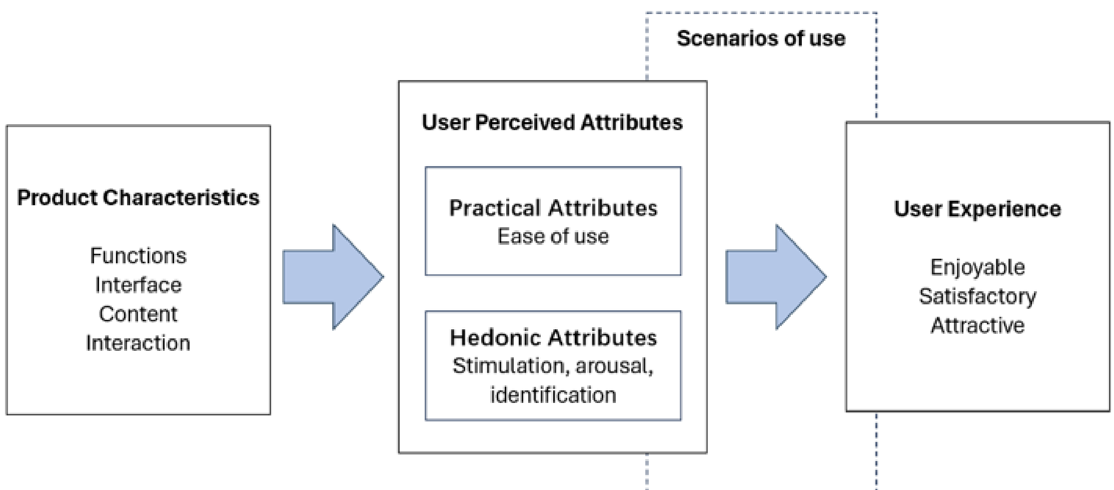

Figure 1.
The model of key elements of user experience based on the user's perspective (Hassenzahl，2010).

Mahlke [24] introduced the concept that user experience primarily comprises users' cognitive processes and emotional reactions towards the object of experience. He also developed a research framework for user experience, as illustrated in Figure 2. The cognitive aspect of user experience is further categorized into technical and non-technical dimensions. Emotional responses occurring directly during the experience and the emotional outcomes established by the end of the experience constitute the emotional component, which significantly influences user experience. Additionally, system features have an impact on user cognition and emotional responses. A bidirectional relationship exists between user cognition and emotional responses, where varying user cognitions and emotional reactions result in diverse experience outcomes, such as usage evaluations or behavioral consequences [25].

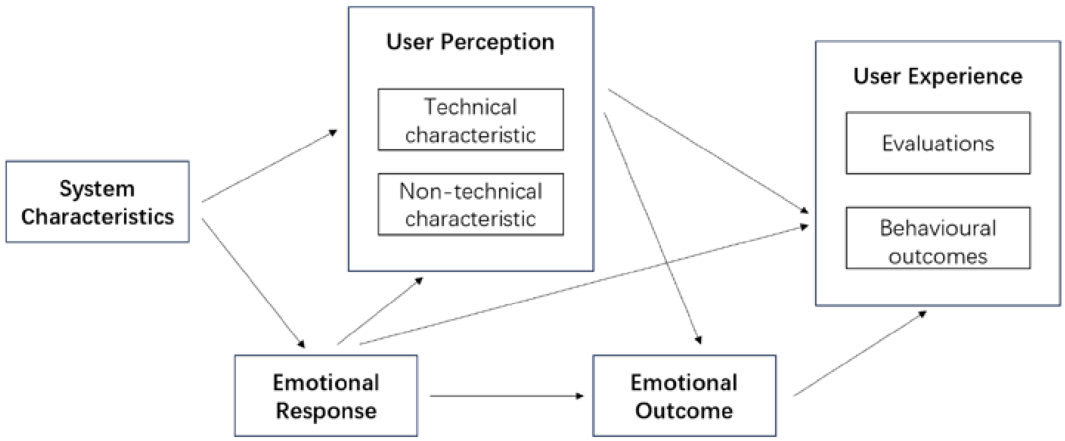

Figure 2.
User experience processes and research frameworks.
Source: Mahlke [24].

The field of media consumption is complex and multifaceted, with audience experience playing a crucial role. Jorge and Dias [26] emphasizes the role of emotions in this experience, especially in identity formation and memory. Lu and Lo [27] delves into the antecedents and consequences of audience satisfaction, including cognitive expectations, audience involvement, and relevance. These studies collectively highlight the importance of audience experience in media consumption, as well as the necessity of a comprehensive understanding of its various components.

This article defines user experience as the subjective feelings and satisfaction generated by the interaction between users and the services or products they use. Audience experience in the media field refers to the subjective experience generated by the audience when watching or listening to media products (programs). According to this concept, user experience mainly involves products, users, and the interaction environment. At the product level, it mainly includes the appearance, usability, and ease of use of products or systems. At the user level, it mainly covers user expectations, user perceptions of products, and the emotions generated during use. Although the interaction environment is also an important variable affecting user experience, due to the complexity and variability of the viewing or listening environment of AI anchors, it is difficult to measure it in a standardized way. Therefore, this study will focus on researching the audience experience of AI anchors from the perspectives of products and users.

Norman [9] proposed the "instinct-behavior-reflection" user experience hierarchy theory based on emotional design, which suggests that user experience can be divided into sensory experience, behavioral experience, and emotional experience. Sensory experience mainly focuses on product appearance design, behavioral experience emphasizes the goal efficiency in user-product interaction, and emotional experience refers to the satisfaction and pleasure after using the product [28]. Based on user experience theory and previous research, this article confirms the following variables:

(1) Product attribute refers to the essential characteristics and properties of a product's basic functions. Each feature of a product has the potential to attract different consumers [12]. Based on previous research, product attributes include interface, content, functionality, and interaction.

Interface Experience: For AI anchors, the interface is the image and voice of the AI anchor perceived by the audience through visual and auditory media. Therefore, this study further clarifies the interface functionality as sensory experience, including four dimensions: voice standardization, clear tone, realistic image, and appropriate appearance [29-31].

Content experience: refers to the audience's experience dimension of the content reported by AI anchors, specifically including four dimensions: content accuracy, low error rate, accurate expression, and accurate movements [29, 32, 33].

Function experience: refers to the various uses of a product. For the audience of AI anchors, it is the significant functions provided by AI anchors, including multi-language broadcasting, multi-style broadcasting, multi-scene broadcasting, and auxiliary text reading in four dimensions [29, 34].

Interactive experience: refers to the state in which AI anchors communicate with the audience, specifically including platform interaction, eye contact interaction, real-time Q&A, emotional interaction, and other four dimensions [35-37].

1. User perceived attributes refer to the unique perceptions of product attributes that users construct based on the perceived product characteristics [23]. In Hassenzahl's user experience key elements model based on the user's perspective, user perceived attributes mainly include the practical attributes and hedonic attributes (as shown in Figure 1).

Practical attributes: ensuring the functionality, efficiency, and user-friendliness of the product can be further refined into three dimensions: powerful functionality, efficient generation of audiovisual products, and ease of use.

Hedonic attributes: emotions and psychology that enhance user experience, refined into three dimensions of freshness, fun, cutting-edge fashion, and creativity.

2. Audience evaluation: Based on emotional responses, it refers to the overall state that humans can evaluate or have effective value, mainly in terms of emotions, moods, and feelings [38]. It involves the psychological expectations before users use the product, sensory experiences during use, and the comprehensive emotions throughout the use process Russell [39]. This study combines the description of emotional responses by researchers and the characteristics of AI anchors, categorizing user experience into three dimensions: satisfaction, pleasure, and attractiveness.

This article argues that user perceived attributes are the unique perceptions generated by the audience based on the characteristics of AI hosts. Based on this, users form the attractiveness or behavioral responses towards products based on the perceived product attributes, which is the interactive result [23]. In other words, product characteristics influence user perception, which in turn affects user experience. Based on this, the article proposes the following research hypotheses:

H_1: The audience's sensory experience and practical perception of AI anchors are positively correlated.

H_2: The audience's content experience and practical perception of AI anchors are positively correlated.

H_3: The audience's functional experience and practical perception of AI anchors are positively correlated.

H_4: The audience's interactive experience and practical perception of AI anchors are positively correlated.

H_5: The audience's sensory experience and enjoyment perception of AI anchors are positively correlated.

H_6: The audience's content experience and enjoyment perception of AI anchors are positively correlated.

H_7: The audience's functional experience and enjoyment perception of AI anchors are positively correlated.

H_8: The audience's interactive experience and enjoyment perception of AI anchors are positively correlated.

H_9: The sensory experience and audience evaluation of AI anchors are positively correlated.

H_{10}: The audience's content experience and evaluation of AI anchors are positively correlated.

H_{11}: The audience's functional experience and evaluation of AI anchors are positively correlated.

H_{12}: The interaction experience and audience evaluation of AI anchors are positively correlated.

H_{13}: The perceived practical attributes of AI anchors by the audience are positively correlated with audience experience.

H_{14}: The entertainment perception attributes of AI anchors by the audience are positively correlated with audience experience.

The research objective of this article is to measure the factors influencing the audience experience of AI anchors. Combining the research hypotheses, the definition of user experience, and the theory of user experience levels, and using Hassenzahl and Mahlke's user experience element model (see Figure 1, Figure 2) as the basic framework, this article constructs a conceptual model of factors influencing the audience experience of AI anchors, as shown in Figure 3.

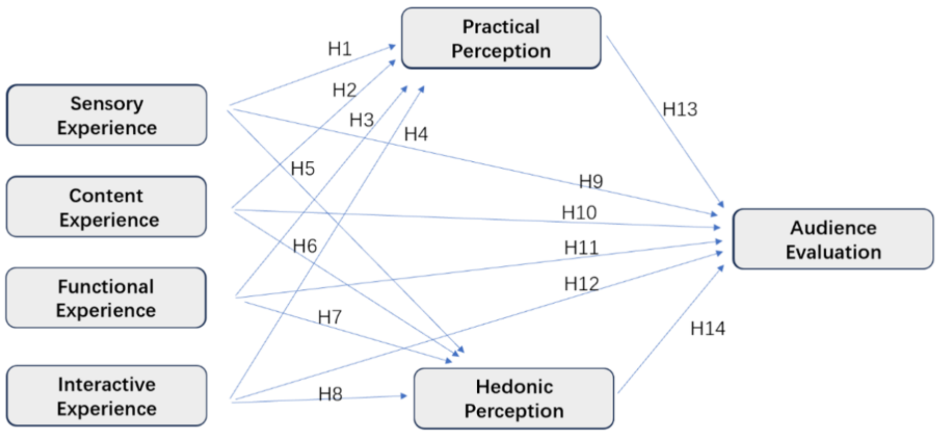

Figure 3.
Research framework of this study.

As depicted in the diagram, the product attributes (sensory experience, content experience, functional experience, interactive experience) serve as the independent variables, while audience perception (utilitarian perception, hedonic perception) functions as the mediating variables, and audience evaluation is considered the dependent variable.

3. Methodology

3.1. Design of the Scale

This study employs a questionnaire survey method for research purposes. The utilization of quantitative research methods aids in enhancing the comprehension of user experience by gathering subjective feeling data from users through survey scales. This method assesses users' subjective feelings and experiences by collecting data on users' satisfaction, attractiveness, and other product or system indicators using survey scales and other tools. It evaluates the feasibility and attractiveness of user experience. In comparison to qualitative research methods, quantitative research methods facilitate the formation of a more objective evaluation of user experience [40, 41]. Consequently, this study opts for the questionnaire survey method within quantitative research methods for its research endeavors.

This study does not specifically focus on the utilization of AI anchors in a particular media context but rather presents a more generalized concept. The research questionnaire clarifies at the outset that the AI anchors discussed in this study are virtual images employed on various media platforms, including broadcast television and mobile internet. These anchors are generated through AI techniques such as speech synthesis, lip synchronization, facial expression synthesis, and deep learning. The aim is to replicate "AI synthetic anchors" with comparable hosting capabilities to human anchors.

The questionnaire utilized in this study comprises two sections. The initial section is designed to gather fundamental demographic data from the participants, encompassing gender, age, educational attainment, occupation, geographical location, and administrative division. This section aims to provide insights into the foundational characteristics of the audience of AI anchors. The second segment employs the Likert five-point scale to assess the audience's experience evaluation of AI anchors. The measured variables in this section include sensory experience, content experience, functional experience, interactive experience, perceived utility, perceived enjoyment, and audience evaluation.

The scale utilized in this study primarily consists of the AttrakDiff2 scale [42] complemented by certain elements from the user experience scale developed by Rubinoff [21]. The questionnaire is evaluated based on the semantic differential scale. These inquiries are designed to evaluate users' subjective perceptions regarding the attractiveness, appeal, usability, and overall experience of the product, facilitating researchers in obtaining a comprehensive insight into how users perceive various facets of the product. Through the examination of diverse dimensions such as hedonic quality, pragmatic quality, stimulation, and identity, the AttrakDiff2 questionnaire offers a thorough evaluation of the user experience. Each item comprises multiple questions, thereby enriching the depth and quality of the gathered data, enabling researchers to acquire a more profound understanding of users' perspectives on product quality and overall appeal. The amalgamation of AttrakDiff2 with usability scales and user experience questionnaires has been demonstrated to be viable for assessing user experience. Several studies have underscored the practicality and efficacy of the AttrakDiff2 questionnaire in appraising user experience, encompassing interactive products and virtual reality software. The integration of AttrakDiff2 with other established measurement techniques further bolsters its efficacy and dependability in capturing the multifaceted dimensions of user experience [43]. In accordance with the specific configuration of the research framework and variables delineated earlier, this study formulated the ensuing scale:

Table 1.
Measurement scales of the questionnaire in this study.

Measuring dimensions	**Measurement question items**
Sensory experience	AI anchor voice specification.
	AI anchor timbre is clear.
	AI anchor's image is real.
	AI anchor has a decent appearance.
Content experience	AI anchor reads the content accurately.
	AI anchor reading error rate is low.
	AI anchor expresses the expressions accurately.
	AI anchor move with precision while broadcasting.
Functional experience	AI anchor can realise multi-language broadcasting.
	AI anchor can realise multi-shape broadcasting.
	AI anchor can realise multi-scene broadcasting.
	AI anchor can assist in text reading.
Interactive experience	AI anchor can't communicate with me through the platform.
	AI anchor can't interact with me by eye.
	AI anchor cannot conduct real-time Q&A with me.
	AI anchor cannot emotionally interact with me.
Practical perception	AI anchor is powerful.
	AI anchor generates audiovisual products efficiently.
	AI anchor is easy to use.
Hedonic perception	AI anchor is fresh and fun.
	AI anchor is fashionable and cutting-edge.
	AI anchor is creative.
Audience evaluation	AI anchor is satisfying.
	AI anchor is delightful.
	AI anchor is attractive.

3.2. Data Recovery and Testing

In order to comprehend the comprehensive situation and influencing factors of the audience experience with AI anchors and to offer insights for the research and implementation of AI anchors in the media, this study focuses on the audience who have engaged with programs hosted by AI anchors in China. The survey questionnaire was disseminated online through the WeChat platform "Questionnaire Star" mini-program and other social media platforms. The questionnaire, conducted in Chinese, had a one-week time limit, and each IP address was restricted to one response. A total of 2330 valid questionnaires were collected, with 1699 respondents acknowledging the presence of AI anchors, and 1015 respondents reporting having watched or listened to programs hosted by AI anchors. Consequently, these 1015 questionnaires were deemed as preliminary valid responses. During the data preprocessing stage, researchers identified that the minimum completion time for the questionnaire was 2 minutes. Consequently, questionnaires with excessively short completion times and highly repetitive responses were eliminated. Out of the 1015 samples, 765 were chosen for the analysis of audience user experience, and these questionnaires were considered as the audience sample for this study.

After the data recovery process, the initial step involves performing an analysis of reliability and validity.

Reliability, also referred to as consistency, pertains to the trustworthiness of a questionnaire, primarily demonstrated in the uniformity, cohesion, reproducibility, and steadiness of the test outcomes. In this research, the α coefficient is utilized to denote the internal consistency reliability of the scale. A higher α value signifies greater consistency among the questionnaire items, indicating enhanced reliability within the scale. A α coefficient below 0.6 suggests inadequate reliability, prompting a need to contemplate revising the questionnaire or selecting contentious indicators within it. A reliability exceeding 0.9 indicates highly stable questionnaire data results, while a reliability ranging from 0.7 to 0.8 is deemed relatively stable.

Table 2.
Reliability test of each variable.

Variable	N of items	Cronbach's alpha
Sensory experience	4	0.895
Content experience	4	0.918
Functional experience	4	0.867
Interactive experience	4	0.917
Practical perception	3	0.790
Hedonic perception	3	0.817
Audience evaluation	3	0.825

Validity indicators of a scale can be evaluated through exploratory factor analysis. The Kaiser-Meyer-Olkin (KMO) test and Bartlett's Test of Sphericity are classic methods employed in exploratory factor analysis to ascertain the suitability of variables for factor analysis. In exploratory factor analysis results, a KMO measure exceeding 0.6 and a significant Bartlett's test of sphericity ($p < 0.05$) suggest the questionnaire's compatibility with principal component analysis. KMO values between 0.6 and 0.7 are acceptable, while values above 0.8 are considered very suitable for factor analysis.

The data presented in Table 4 indicates a KMO value of 0.892 and a significant Bartlett's sphericity test result ($p < 0.001$), affirming the scale's suitability for factor analysis.

Table 3.
KMO and Bartlett's test.

KMO		0.892
Bartlett's test of sphericity	Approx. chi-square	11356.072
	df	300
	sig	<0.001

Confirmatory Factor Analysis (CFA) is an integral component of Structural Equation Modeling (SEM) analysis, utilized to determine if latent variables can be effectively represented by multiple measurement items. Validation of the measurement model is imperative before analyzing the structural model. The fit of the measurement model must be assessed, with acceptable fit allowing for SEM analysis to proceed. The results of the confirmatory factor analysis for this study are detailed in Table 5.

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Table 4.
Model fit indices of the overall scale.

Indicators	Suggested value	Modelled Indicators	Conformity
$\chi^2/\delta\phi$	$1<\chi^2/df<5$	2.132	Conformity
RMSEA	<0.08	0.038	Conformity
GFI	>0.8	0.947	Conformity
CFI	>0.8	0.974	Conformity
IFI	>0.8	0.974	Conformity
TLI	>0.8	0.970	Conformity
AGFI	>0.8	0.932	Conformity

The fit indices of the structural equation model indicate a good fit, with $c^2/df=2.132$ (<5), RMSEA=0.038 (<0.08), and GFI, IFI, TLI, AGF all exceeding 0.8. These results meet the standard for general SEM research, suggesting a well-fitting model suitable for structural equation model analysis.

Table 5.
Results of the convergent validity analysis of the overall scale.

Variable	Item	β	b	Se	C.R.	P	CR	AVE
Sensory experience	SE1	0.791	1				0.896	0.684
	SE2	0.845	1.246	0.049	25.289	***		
	SE3	0.819	1.135	0.047	24.389	***		
	SE4	0.851	1.163	0.046	25.513	***		
Content experience	CE1	0.886	1				0.918	0.738
	CE2	0.845	0.973	0.028	35.107	***		
	CE3	0.819	0.917	0.028	32.718	***		
	CE4	0.885	1					
Functional experience	FE1	0.817	1				0.867	0.621
	FE2	0.802	1.023	0.043	23.639	***		
	FE3	0.746	0.891	0.041	21.688	***		
	FE4	0.785	0.959	0.042	23.069	***		
Interactive experience	IE1	0.876	1				0.917	0.734
	IE2	0.829	0.935	0.032	29.539	***		
	IE3	0.842	0.958	0.032	30.333	***		
	IE4	0.879	1.011	0.031	32.737	***		
Practical perception	PP1	0.765	1				0.792	0.559
	PP2	0.769	1.032	0.057	18.174	***		
	PP3	0.707	0.905	0.052	17.262	***		
Hedonic perception	HP1	0.825	1				0.817	0.599
	HP2	0.738	0.86	0.045	19.049	***		
	HP3	0.757	0.837	0.043	19.369	***		
Audience evaluation	AE1	0.836	1				0.827	0.614
	AE2	0.759	0.82	0.04	20.504	***		
	AE3	0.753	0.804	0.039	20.382	***		

Convergent validity pertains to the extent of agreement in measurement outcomes when different measurement techniques are employed to evaluate the same attribute; essentially, diverse measurement approaches should align in assessing the same attribute. Convergent validity, also known as convergent validity, involves the examination of test indicators measuring the same underlying trait (construct) aligning on a common factor. This is evaluated by scrutinizing convergent validity through Construct Reliability (CR) and Average Variance Extracted (AVE). Typically, composite reliability exceeds 0.7, with Average Variance Extracted (AVE) surpassing 0.5, which are recognized as standard benchmarks. The factor loading values of the items for the seven variables - sensory experience, content experience, functional experience, interactive experience, perceived utility, hedonic perception, and audience evaluation - all exceed 0.6, indicating robust convergent validity. The composite reliability (C.R.) values for each dimension exceed 0.7, meeting the standard, and the Average Variance Extracted (AVE) is above 0.5, also meeting the standard. This suggests that the scale employed in this study exhibits strong convergent validity, and the fit falls within an acceptable range. Consequently, all items can be retained for further analysis.

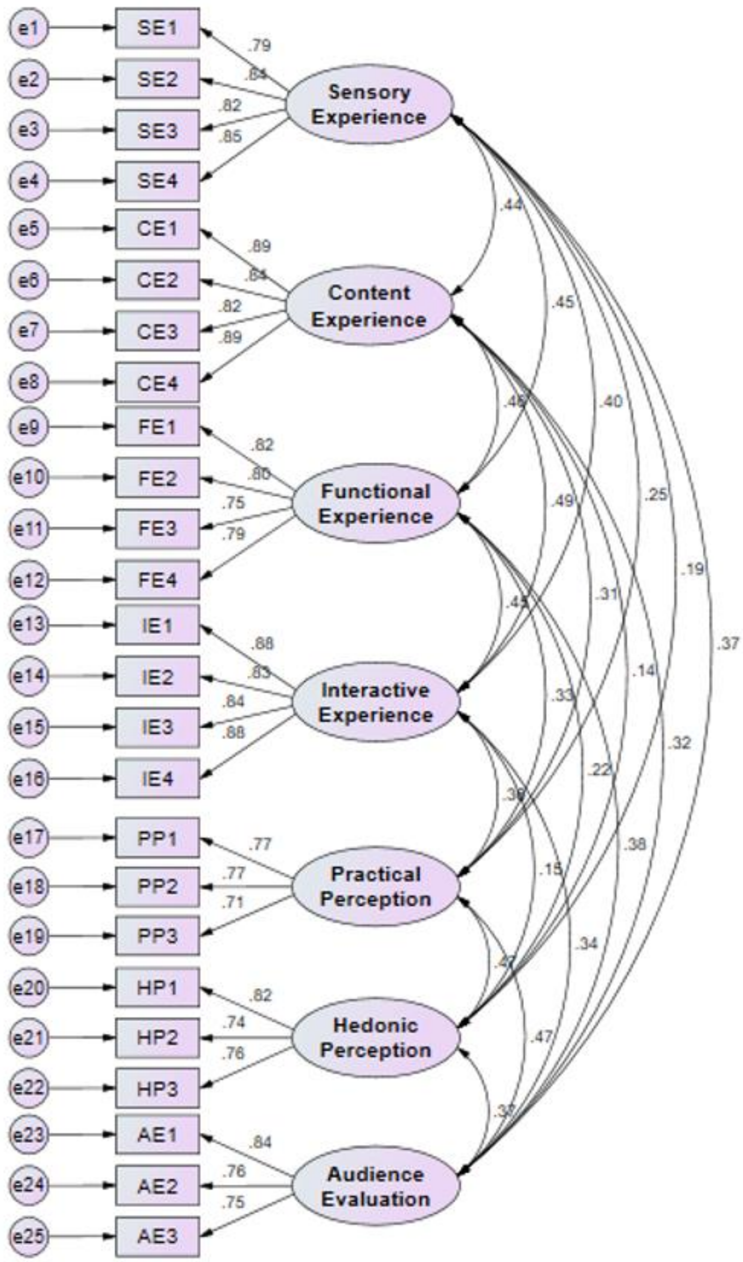

Figure 4.
illustrates the confirmatory factor model of the overall scale.

Discriminant validity analysis aims to determine if there is a statistical distinction between the correlations of two distinct constructs. Ideally, items from different constructs should not display a high correlation. A correlation exceeding 0.85 suggests that these items are measuring the same variable.

This study employs the Average Variance Extracted (AVE) method to evaluate discriminant validity. In this approach, the square root of AVE for each factor should surpass the correlation between each pair of variables to establish distinct validity among the factors.

As depicted in Table 7, the square root of the Average Variance Extracted (AVE) for each factor on the diagonal (ranging from 0.748 to 0.859) exceeds the maximum value of the standardized correlation coefficients outside the diagonal (0.493). Hence, this study demonstrates discriminant validity. The lower triangle denotes the correlation coefficients.

Table 6.
Discriminant validity analysis.

	Content experience	Sensory experience	Functional experience	Practical perception	Hedonic perception	Audience evaluation	Interactive experience
Content experience	0.859						
Sensory experience	0.439	0.827					
Functional experience	0.457	0.446	0.788				
Practical perception	0.310	0.255	0.328	0.748			
Hedonic perception	0.141	0.192	0.222	0.474	0.774		
Audience evaluation	0.318	0.374	0.379	0.472	0.367	0.784	
Interactive experience	0.493	0.398	0.451	0.365	0.151	0.338	0.857

The study will employ multiple regression analysis and structural equation modeling for data analysis, model fit validation, and validation of the research framework and hypotheses. Structural equation modeling (SEM) is a potent tool for testing model fit and analyzing latent and observed variables [44]. SEM's capability to analyze complex relationships and models, such as confirmatory factor analysis and second-order latent variables, makes it a valuable tool in quantitative research [45]. In this study, the independent variables are not observational variables like age and height but rather abstract concepts and variables that cannot be precisely measured for various reasons. These latent variables are more suitable for data analysis using Structural Equation Modeling (SEM).

4. Research Discussion

4.1. Overview of Data Analysis

In this study, a total of 765 valid samples were collected and analyzed using SPSS 26.0 and Amos 26.0. The basic information regarding the collected samples is detailed in Table 7.

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Table 7.
Sample distribution situation.

Variable	Classification	Frequency	Percent
Gender	Male	316	41.3
	Female	449	58.7
Age	20 years old and below	220	28.8
	21-30 years old	332	43.4
	31-40 years old	99	12.9
	41-50 years old	72	9.4
	51 years old and above	42	5.5
Educational level	High school/secondary school and below	38	5
	College	34	4.4
	Bachelor's degree	509	66.5
	Master and above	184	24.1
Occupation	Scientific researcher	14	1.8
	Announcer-host	94	12.3
	Media Practitioners (Non-Announcer-Host)	63	8.2
	Teachers of media-related disciplines	110	14.4
	College students	335	43.8
	Government agencies, institutions,	51	6.7
	Staff of social organisations	42	5.5
	Employees of enterprises	15	2
	Freelancers	41	5.4
Region	East China	350	45.8
	North China	120	15.7
	Central China	62	8.1
	South China	79	10.3
	Southwest China	63	8.2
	Northwest China	24	3.1
	Northeast China	67	8.8

As illustrated in Table 7, the sample comprises a slightly higher number of females than males, with the majority of respondents being under 30 years old. The largest proportion of participants holds a bachelor's degree, exceeding 60%. Notably, the survey includes a higher percentage of current university students, with a majority of respondents hailing from the East China region. This trend can be attributed to the likelihood of university students being more exposed to new technologies and the East China region's advanced economic development and significant involvement in high-tech industries. It is important to highlight that this study employed rigorous sample selection procedures prior to data analysis.

The measurement model proposed in this study comprises 7 variables: sensory experience, content experience, functional experience, interactive experience, perceived usefulness, perceived enjoyment, and audience evaluation, totaling 25 items. All scales utilize a 5-point Likert scale ranging from 1 to 5. Higher scores on all variables indicate higher levels of evaluation. The skewness and kurtosis values for all items are below 2 and 7, respectively, suggesting that the sample distribution adheres to normality. Descriptive statistics for the 25 measurement items are presented in Table 8.

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Table 8.
Descriptive statistics.

Variable	Item	Minimum	Maximum	Mean	Sd	Skewness	Kurtosis
Sensory experience	SE1	1	5	3.63	1.012	-0.479	-0.175
	SE2	1	5	3.62	1.180	-0.615	-0.484
	SE3	1	5	3.56	1.108	-0.505	-0.435
	SE4	1	5	3.61	1.094	-0.470	-0.466
Content experience	CE1	1	5	3.41	1.105	-0.367	-0.481
	CE2	1	5	3.36	1.155	-0.329	-0.662
	CE3	1	5	3.32	1.123	-0.301	-0.563
	CE4	1	5	3.36	1.158	-0.353	-0.637
Functional experience	FE1	1	5	3.4	1.216	-0.338	-0.796
	FE2	1	5	3.32	1.266	-0.211	-1.018
	FE3	1	5	3.26	1.187	-0.205	-0.874
	FE4	1	5	3.38	1.213	-0.224	-0.850
Interactive experience	IE1	1	5	3.51	1.113	-0.616	-0.212
	IE2	1	5	3.52	1.099	-0.440	-0.457
	IE3	1	5	3.43	1.109	-0.462	-0.334
	IE4	1	5	3.45	1.122	-0.509	-0.373
Practical perception	PP1	1	5	3.47	1.101	-0.426	-0.486
	PP2	1	5	3.36	1.130	-0.387	-0.560
	PP3	1	5	3.43	1.078	-0.420	-0.350
Hedonic perception	HP1	1	5	3.53	1.230	-0.547	-0.679
	HP2	1	5	3.54	1.182	-0.473	-0.683
	HP3	1	5	3.45	1.123	-0.372	-0.589
Audience evaluation	AE1	1	5	3.79	1.260	-0.932	-0.145
	AE2	1	5	3.58	1.139	-0.506	-0.500
	AE3	1	5	3.45	1.124	-0.487	-0.475

4.2. Evaluation of Structural Equation Model Fit

A crucial aspect of conducting structural equation modeling analysis is ensuring a satisfactory model fit. In the context of structural equation modeling, various fit indices are utilized to assess the adequacy of the model. These indices include the ratio of chi-square degrees of freedom, which is recommended to fall within the range of 1-3, with values below 5 also considered acceptable. Additionally, the Root Mean Square Error of Approximation (RMSEA) is expected to range from 0.05 to 0.08, with values below 0.05 indicating a highly favorable fit. The Goodness of Fit Index (GFI) is generally deemed acceptable when exceeding 0.9, although values above 0.8 are still considered adequate. Furthermore, the Comparative Fit Index (CFI) and Tucker-Lewis Index (TLI) are expected to surpass 0.9. It is also recommended to have a sample size exceeding 200 for robust analysis [46, 47]. The results of the model fit assessment in this study are presented in Table 9.

Table 9.
Fit indices of the structural equation model.

Indicators	Suggested value	Modelled Indicators	Conformity
$\chi^2/\delta\phi$	$1<\chi^2/df<5$	2.475	Conformity
RMSEA	<0.08	0.044	Conformity
GFI	>0.8	0.939	Conformity
CFI	>0.8	0.966	Conformity
IFI	>0.8	0.967	Conformity
TLI	>0.8	0.960	Conformity
AGFI	>0.8	0.922	Conformity

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The fit indices displayed in Table 8 indicate that the model meets the stipulated requirements for structural equation modeling analysis. Notably, the chi-square degrees of freedom ratio falls within the specified range, RMSEA is below 0.08, and GFI, CFI, IFI, TLI, and AGFI all exceed 0.9. Consequently, based on the established fit standards, the model is deemed suitable for structural equation modeling analysis. The structural equation model diagram for this study is depicted in Figure 5.

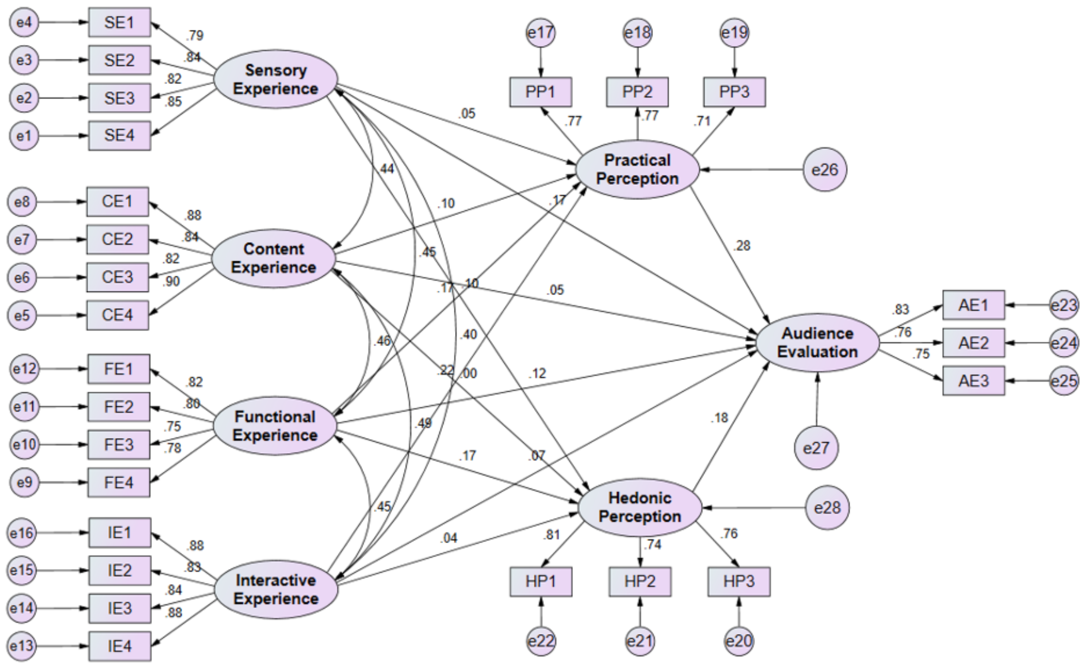

Figure 5.
Structural equation model diagram results.

The path analysis structure among variables in this study is detailed in Table 10.

Table 10.
Path analysis among variables in the initial model.

Regression path			β	b	S.E.	C.R.	P
Practical perception	←	Sensory experience	0.052	0.047	0.044	1.062	0.288
Practical perception	←	Content experience	0.103	0.084	0.041	2.042	0.041
Practical perception	←	Functional experience	0.167	0.148	0.046	3.23	0.001
Practical perception	←	Interactive experience	0.22	0.188	0.043	4.388	***
Hedonic perception	←	Sensory experience	0.103	0.095	0.046	2.042	0.041
Hedonic perception	←	Content experience	0.004	0.003	0.043	0.07	0.944
Hedonic perception	←	Functional experience	0.167	0.15	0.048	3.12	0.002
Hedonic perception	←	Interactive experience	0.038	0.033	0.044	0.748	0.455
Audience reviews	←	Practical perception	0.279	0.344	0.056	6.119	***
Audience evaluation	←	Hedonic perception	0.185	0.224	0.049	4.565	***
Audience evaluation	←	Sensory experience	0.17	0.19	0.051	3.756	***
Audience evaluation	←	Content experience	0.045	0.046	0.047	0.977	0.328
Audience evaluation	←	Functional experience	0.124	0.135	0.053	2.544	0.011
Practical perception	←	Interactive experience	0.067	0.07	0.049	1.429	0.153

Note: β，represents the standardized coefficient; b represents the unstandardized coefficient. ***, $P < 0.001$.

It is important to note that in the analysis of the data, sensory experience does not significantly influence practical perception, content experience does not significantly impact hedonic perception, interactive experience does not significantly affect hedonic perception, content experience does not significantly influence audience evaluation, and interactive experience does not significantly impact audience evaluation. Consequently, the study derives the following conclusions from the data analysis.

H_1: There is no positive correlation between the audience's sensory experience and practical perception of AI anchors, as not supported.

H_2: The positive correlation between the audience's content experience and practical perception of AI anchors is supported.

H_3: The positive correlation between the audience's functional experience and practical perception of AI anchors is supported.

H_4: The positive correlation between the audience's interactive experience and practical perception of AI anchors is supported.

H_5: The positive correlation between the audience's sensory experience and hedonic perception of AI anchors is supported.

H_6: The positive correlation between the audience's content experience and hedonic perception of AI anchors is not supported.

H_7: The positive correlation between the audience's functional experience and hedonic perception of AI anchors is supported.

H_8: The positive correlation between the audience's interactive experience and hedonic perception of AI anchors is not supported.

H_9: There is a positive correlation between sensory experience and audience evaluation of AI anchors, supporting audience engagement.

H_{10}: The positive correlation between the audience's content experience and evaluation of AI anchors is not supported.

H_{11}: The positive correlation between the audience's functional experience and evaluation of AI anchors is supported.

H_{12}: The positive correlation between interactive experience and audience evaluation of AI anchors is not supported.

H_{13}: The practical perception of AI anchors by the audience is positively correlated with audience evaluation, supporting this relationship.

H_{14}: The audience's hedonic perception of AI anchors is positively correlated with audience evaluation, supporting this relationship.

In accordance with the research framework of this study, practical perception and hedonic perception act as mediating variables between the audience's sensory experience, content experience, functional experience, interactive experience with AI anchors, and audience evaluation. The presence of the mediating effect can be directly examined using the bootstrap method. Through the application of the Bootstrap method in AMOS 26.0, with 5000 repetitions, a 95% confidence interval standard, and bias correction, the mediation effect was evaluated, leading to the following conclusions:

Table 11.
Mediation effect assessment.

Regression path	Effect	SE	Bias-corrected 95%CI			Percentile 95%CI		
			Lower	Upper	p	Lower	Upper	p
Content experience→Practical perception→Audience evaluation	0.037	0.018	0.007	0.078	0.015	0.005	0.074	0.021
Functional experience → Practical perception → Audience evaluation	0.061	0.022	0.026	0.117	0	0.022	0.109	0.001
Interactive experience→Practical perception→Audience evaluation	0.075	0.023	0.036	0.127	0	0.034	0.125	0.001

Sensory experience → Hedonic perception → Audience evaluation	0.022	0.012	0.004	0.053	0.011	0.002	0.049	0.021
Functional experience → Hedonic perception → Audience evaluation	0.036	0.015	0.013	0.075	0	0.011	0.07	0.001

As illustrated in Table 11, the confidence interval of the mediator path excludes 0, and the p-value is below the significance level of 0.05, indicating the establishment of the mediation effect. Consequently, it can be inferred that practical perception mediates between content experience, functional experience, interactive experience, and audience evaluation, while hedonic perception mediates between sensory experience, functional experience, and audience evaluation.

5. Conclusion

This study employed a questionnaire survey method with a sample size of 765 and utilized data analysis tools like SPSS and AMOS to validate the impact of the audience's sensory experience, content experience, functional experience, and interactive experience of AI anchors on user experience. The research was grounded in user experience theory, with practical perception and hedonic perception serving as mediating factors.

The analysis of the data indicates that the audience's engagement with the content, functionality, and interaction of AI anchors positively affects their perception of the practicality of AI anchors. Sensory experience, content experience, and functionality experience of AI anchors are linked to the audience's hedonic perception. This suggests that accurate content delivery, enhanced functionality in reporting across various languages and scenarios, and interactive capabilities contribute to the audience's perception of AI anchors as powerful in functionality, leading to the creation of efficient audiovisual products that offer practical experiences. Factors such as voice norms, authentic appearance, accurate reporting, and multilingual and stylistic reporting contribute to the audience perceiving AI anchors as innovative, engaging, and creative.

Sensory and functional experiences directly impact the audience's evaluation of AI anchors. Key factors influencing audience satisfaction and hedonic include the standardization of the AI anchor's voice, clarity of tone, authenticity of appearance, appropriateness of styling, ability to deliver broadcasts in multiple languages and styles, and support for text reading. Practical perception and hedonic perception, as mediating variables, are the primary emotional responses influencing the audience's evaluation of AI anchors, emphasizing utility and enjoyment as the primary cognitive dimensions in the audience's assessment of AI anchors.

Furthermore, the study reveals that the audience's sensory experience and practical perception of AI anchors are not strongly correlated. Additionally, the correlation between content experience, interaction experience, and hedonic perception is weak, indicating that factors such as voice norms and tone clarity do not significantly impact the audience's assessment of AI anchors. Similarly, the accuracy of broadcasts and interactive capabilities has little influence when the audience perceives AI anchors as fresh, interesting, cutting-edge, and creative. These experiential indicators also have minimal impact on the audience's final evaluation.

Prior research on the audience's interaction with AI anchors has predominantly examined nuanced factors such as speech rate, gender, physical appearance, and resemblance to human beings [5-7]. The data analysis outcomes presented above have significantly broadened the scope of user experience theory within the context of AI anchor applications, shedding light on the influence of various product characteristics on audience engagement. This study has not only enriched the evaluation framework for new media technology products but has also laid the groundwork for future investigations. The findings hold substantial relevance for research institutions and developers involved in the utilization of AI anchors.

Research indicates that the majority of audiences exhibit a preference for virtual broadcasting hosts that possess a more lifelike appearance and human-like voice [8]. However, for radio and television hosts, the mastery of skills such as appropriate pauses, fluidity in speech, emphasis, intonation, rhythm, and other expressive techniques is deemed essential [48, 49]. It is evident that artificial intelligence hosts still exhibit notable deficiencies in these areas when compared to audience expectations, including a discernible gap in physical appearance when juxtaposed with human hosts. From a developmental perspective, enhancing the auditory capabilities of artificial intelligence hosts, improving their facial expressions and movements, and integrating them with more sophisticated visual presentation techniques can lead to a more authentic portrayal, thereby augmenting the audience's assessment of the practical utility of artificial intelligence hosts.

In conclusion, the focus should be on providing audiences with enjoyable experiences through virtual AI anchors on television and new media platforms to enhance innovation and audience interest. Improving interactive attributes, including verbal and emotional interactions, is crucial for enhancing the audience's viewing experience. The study emphasizes the importance of effective communication with the audience through innovative interaction design and script development for AI anchors.

However, the study acknowledges limitations, such as a sample bias towards college students and the need for more comprehensive questionnaire items to encompass all aspects of contemporary AI anchors. Future research should explore each dimension of AI anchors based on different theoretical frameworks to provide more detailed insights.

As AI technology advances rapidly, there is a growing variety of new AI anchor products available to audiences. This research can inspire new research questions to further expand theoretical research and offer valuable insights for research and application institutions working with AI anchors.

Transparency:

The authors confirm that the manuscript is an honest, accurate, and transparent account of the study; that no vital features of the study have been omitted; and that any discrepancies from the study as planned have been explained. This study followed all ethical practices during writing.

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