

RESEARCH ON THE INTERACTIVE EFFECTS OF PARENTING ADVERTISING UNDER THE SUSTAINABLE DEVELOPMENT GOALS (SDGS)

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ABSTRACT

Objective: The objective of this study is to investigate the different effects of advertising interactive experiences, and explore effective advertising interactive methods, to provide effective parenting advertising training for abusive parents.

Theoretical Framework: Refers to the multi-sensory advertising interaction model based on the studies before, such as the AIEDA tourism advertising effects model, schema congruence theory, and a spiral brand experience concept.

Method: This study conducted the distinct "Systematic Literature Review Synthesis Process", a stand-alone literature review typology that helps make sense of a chosen body of current literature and helps determine the theoretical framework at the early stages of research ideation.

Results and Discussion: The results revealed that visual, auditory, and multi-sensory interactions all have different elements and characteristics and could cause different levels of attention, memory, and emotions for audiences.

Research Implications: The results are expected to guide the development of a theoretical framework for combining advertising and user experience interaction.

Originality/Value: The research helps to identify interactive sensory experience characteristics in advertisements, guide the effective dissemination of parenting public service advertisements, and create a happier family atmosphere for children, to promote SDG 3 on ensuring healthy lifestyles and promoting the well-being of people of all ages.

Keywords: sustainable development goals (SDGS) 3, user experience interaction, parenting advertising, experience effects, happier family atmosphere.

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1 INTRODUCTION

Many parents have become increasingly busy under the increasing work pressure, resulting in a certain lack of parenting knowledge and forcing many children to live in unhappy or even violent family environments. Therefore, it is necessary to use some public time and facilities that do not occupy the work of the parents, such as public service advertisements, to train these abusive parents.

In recent years, as times change, advertisements have appeared in various interactive forms that attract users' attention. According to human attention channels for information processing can be divided into visual user experience, auditory user experience, multi-channel sensory user experience, and so on (Yu & Fu, 2021). Different sensory experience methods can bring different experience effects to users, and can also produce different experience emotions. These emotions have a great influence on users' consumption decisions.

According to Norman (2004), the emotional system changes how the cognitive system operates. Norman (2004) also says that human beings, as the most complex of all animals, have three levels of the brain: “the automatic, prewired layer, called the visceral level; the part that controls everyday behavior, known as the behavioral level; and the contemplative part of the brain, or the reflective level. All of these levels build our intellect and influence our actions, from the simplest, like escaping from a hot surface, to complex ones like choosing one product or brand instead of the other. Let him produce the most initial surface feeling, then affect his behavioral decision-making, and finally affect the introspective reflection layer of his contemplation. At the same time, research shows that attracting attention to interactive content through pleasurable experiences (Cauberghe & De Pelsmacker, 2010).

Therefore, this paper recommends taking the user's pleasurable experience as the premise and starting from three interactive sensory methods to try to conclude the interactive experience model that helps to strengthen the user's attention to the advertisement and provides some ideas for the effective interactive experience of advertising design.



2 THEORETICAL FRAMEWORK

Selected theoretical framework was based on for this study. Among the multi-sensory advertising interaction models include the AIEDA tourism advertising effects model (Weng *et al.*, 2021), Schema Congruence Theory (Lee & Kim, 2022), and a spiral brand experience concept (Wanick, Ranchhod and Gurau, 2017).

AIEDA Tourism Advertising Effects Model: This model outlines the different stages of the advertising process, emphasizing how various sensory inputs can enhance the overall effectiveness of tourism advertisements. By integrating cognitive and emotional responses, this model illustrates how multi-sensory elements can attract potential tourists and influence their decision-making processes.

Schema Congruence Theory: This psychological framework posits that individuals utilize cognitive schemas to interpret and respond to messages. In the context of multi-sensory advertising, schema congruence refers to the alignment between the sensory information presented and the audience's existing mental frameworks. A high degree of congruence enhances the effectiveness of the advertising message, leading to better recall and positive attitudes toward the brand.

Spiral Brand Experience Concept: This concept highlights the dynamic and evolving nature of brand experiences, illustrating how multiple interactions across different sensory modalities can amplify consumer engagement over time. The spiral model suggests that as consumers encounter various sensory components of the brand, their emotional and cognitive responses deepen, resulting in a more robust and lasting brand connection.

By synthesizing insights from these foundational theories and models, this study constructs a multi-sensory advertising interaction model for understanding the multi-sensory advertising interaction. This framework not only synthesizes existing knowledge but also provides a structured pathway for future research in this burgeoning field, identifying areas where further investigation is needed to enhance our understanding of interactive experience design and its impact on consumer behavior.



3 METHODOLOGY

This study follows the distinct "Systematic Literature Review Synthesis Process" (Luo Na *et al.*, 2022; Shasha *et al.*, 2023). According to Rousseau *et al.* (2008), this procedure is a stand-alone literature review typology that helps make sense of a chosen body of current literature and helps determine the theoretical framework at the early stages of research ideation. Ibrahim (2011) identified the construct categorization technique of the research question (RQ) as RQ Constructs—'WHO', 'WHAT', and 'HOW'—when formulating a main research question. 'WHO' is the element being affected by the study, 'WHAT' is the information or body of knowledge needed to solve the problem, and 'HOW' is the intended influence of the study.

The RQ construct "User Experience Interaction" was chosen for consideration in this investigation. This study used keywords like "visual interaction, auditory interaction, and multi-sensory interaction", and the Scopus and Google Scholar databases were searched to find the academic articles. A total of 30 journal articles were identified after a title search and filtering out full research papers from the year 1996 to the present. The abstracts were reviewed and assigned to smaller topics named effects of the impact of various sensory interactions on user experience in advertising, the impact of auditory interaction on user experience in advertising, and the impact of multi-channel sensory interaction on user experience in advertising. The abstracts were reviewed in terms of the major findings of previous scholars, how their work could support future studies, and what aspects need to be improved.

The results of this study produced a synthesized summary for each subthem, which went further cross-analysis, integration of possibilities, and prioritization of the synthesized summary towards highly probable solutions for understanding the effects of interactive experience in advertising. Key summaries are presented in the 'Point of Departure (POD) Tree Diagram' adapted from Ibrahim & Mustafa Kamal (2018) shown in Figure 1. This study used the online EAGLE system to document the systematic review synthesis process. Figure 2 illustrates the conceptual framework proposed for the same.





4 RESULTS AND DISCUSSIONS

With the development of society and population, the current public environment has long been flooded with various advertisements. Whether in the offline public facility environment or online public websites, advertisements for various products or services can be seen everywhere. In this kind of information explosion environment, designers need to consider how to increase the user's attention to the specified advertisement and perceive the content information that the advertisement wants to convey. According to Weng *et al.* (2021), the AIEDA tourism advertising effects model includes five hierarchical stages: Attention→ Interest→Evaluation (Perceived Usefulness→ Perceived Credibility) → Desire →Action. Among them, attracting the audience's attention is the crucial first step. Based on attention, the audience may be interested in the content of the advertisement. Then the usefulness and credibility can be evaluated through perceptual information, and then the desire to purchase may be generated, and the order will be triggered. Therefore, combining the above, this study can start with visual sensory interaction, auditory sensory interaction, and multi-channel sensory interaction to achieve the goal of increasing the audience's attention.

4.1 THE IMPACT OF VISUAL INTERACTION ON USER EXPERIENCE IN ADVERTISING

Visual sensory interaction is a common interactive method used in the advertising industry. Advertisers mainly perceive the content they want to deliver through mobile phone advertisement using visual elements such as graphics and text and produce subsequent consumer purchase behaviors. However, considering the current complex public visual environment, there is a need to analyze how different visual elements in Chinese PSAs could better attract parents' attention.

Firstly, there are graphic elements which can be divided into static graphics and dynamic graphics. For static graphics, different shapes of graphics have different effects on attracting users' attention. In the online environment, audiences typically adopt advertising avoidance behaviors to avoid being



disturbed by advertising (Celebi, 2015). This is because, in this era of Internet information explosion, most online users have become accustomed to full-screen pop-up advertisements. Habitual objects can hardly produce curiosity and attention. Specifically, they deliberately avoid the rectangular or square regions around the main content of web pages, which their schema recognizes as advertising messages (Liu *et al.*, 2018). However, it is only the regular square regions that made users automatically avoid. According to schema congruence theory, incongruous information could produce interest in users and subsequently increase their attention (Lee & Kim, 2022). Therefore, interactive mobile phone Chinese PSAs design could completely re-attract the parents' attention by changing the graphic shape of the advertising area. Liu *et al.* (2018) tested the effect of changing the advertising graphic from square to diamond on user's attention and the results proved that the shape change could attract users' attention to a certain extent. However, when the new shape is viewed multiple times, it will also no longer attract user's attention (Liu *et al.*, 2018). Therefore, for effective information output, the shape of static graphics needs to be updated frequently.

For dynamic graphics, its variability includes shape actions in addition to shape modeling. Therefore, the impact on the parents' attention is also richer. He (2017) mentioned that dynamic emotional advertising can evoke emotional responses in the audience, that is to say, compared with static graphics, dynamic graphics can better attract user's attention and even cause emotional reactions with rich actions to an extent. Malik *et al.* (2009) have also done experiments on the impact of dynamic graphics where they embedded specific emotions in typographic animations and tested them on 46 participants. They discovered that movements such as shaking, twisting, fading, bouncing, looping, jittery movements, and flashing can convey emotions such as anger, sad, happy, and fear. Therefore, this study notes that different dynamic actions in dynamic graphics can not only attract attention but also convey different emotions.

Additionally, the text bears a very important explanatory meaning in the advertisement and presentation such as slogan, title, explanatory text, etc. (Adab & Valdés, 2004). Text and graphics are often match and help each other



in advertisements. Hence, when graphics cannot be explained quickly and effectively, text is necessary. Kim and Jang (2019) have researched the effectiveness of text attention in the food advertising industry, and the results prove that text-dominant ads were significantly more effective than picture-dominant advertisements for individuals who are unfamiliar with the culture of the cuisine's country of origin. Therefore, when deciding to use text as the main body of interactive Chinese PSAs in mobile phone, it is necessary to consider the parent's familiarity with the cultural content of the advertisements. In addition, the results also suggest that marketers need to increase customers' attention by customizing advertising formats based on target customers with varying levels of cultural familiarity (Kim & Jang, 2019). The advertising formats mentioned here are text content and presentation methods. For example, in rural areas of China, most of the sentences used in banner advertisements are words that are easy to understand by villagers. This method is more effective for local villagers than using words that are deep but obscure.

Based on the above discussion, Table 2.1 shows the visual impact of different visual elements in advertising. This study proposes that visual sensory interaction can better attract the attention of users in the complex information society by using novel static graphic shapes, appropriate dynamic graphic actions, and text elements according to the user's cultural background.

Table 1.

The visual impact of different visual elements in advertising

Element	Factors	Influential impact
Static graphics	Shape	Novel shapes can attract users' attention better than fixed shapes. However, the novel shape will be less attractive after long-term use.
Dynamic graphics	Dynamic	Shaking, twisting, fading, bouncing, looping, jittery movements and flashing can convey emotions of anger, sadness, happiness, and fear.
Text	User's cultural background	When users are not familiar with the cultural background of advertising, text is more effective than pictures. For users with different educational backgrounds, different forms of text expression can arouse different degrees of attention.





4.2 THE IMPACT OF AUDITORY INTERACTION ON USER EXPERIENCE IN ADVERTISING

Yu and Fu (2021) mentioned that with the continuous development of new media technology, presentation modes of media content continue to increase, and auditory information has become a new media presentation mode second only to traditional visual information. Spence and Wang (2015) mentioned that people could judge the material, size, temperature, and other information of the object through the sound of the interaction with the object or the environment. Therefore, in the current information society, many advertisements try to use auditory sensory interaction to convey information (Sutherland, 2020). For example, Pampers once used a lullaby which sang of mother's love, care, and expectations for her children as an aural sensory advertisement. It expressed the characteristics of Pampers well. The bubbling sound of Coca-Cola beverages has also been used in various advertising and marketing for the brand many times, allowing users to feel the cool and refreshing sensory feeling of the product for the first time from the auditory sense.

Yu and Fu (2021) found that auditory information affects the audience's experience, attention, memory, emotions, decision-making, and feedback, forming auditory information through both real and virtual sounds. Lowe and Haws (2017) highlighted the elements that convey information to users in auditory sensory interactions which include the speed of speech, pitch, accent, timbre, gender, etc. of the voice. In addition, It is also mentioned by Yu and Fu (2021) that the speed of speech (too fast or too slow) in the advertisement can greatly affect the recognition of information. Hagtvedt and Brasel (2016) pointed out that there is a cross-correspondence between pitch and visual brightness. Furthermore, Krishna (2012) mentioned that high-frequency sounds can draw the audience's visual attention to light-colored objects, and low-frequency sounds can draw the audience's visual attention to dark-colored objects. In an earlier study, Spence (2011) stated that people tend to match larger objects with bass, and smaller objects with treble. Therefore, if the key information (picture or text) in the Chinese PSAs is light-colored and small, the



use of high-frequency sounds to attract the parents' attention can help. If dark colored, low-frequency sounds would be most suitable.

Biswas, Lund, and Szocs (2019) also found another feature of tone useful in attracting audience attention. Low-volume music can calm the mood, leading to increased purchase of healthy foods while high-volume music tends to increase audiences excitement, leading to increased purchase of unhealthy food. Besides that, several studies showed that the difference in tone also has a certain impact on the persuasiveness of the advertisement. For example, Zoghaib (2019) found that speakers with bass (vs treble), dull (vs bright), and smooth (vs rough) tones are more convincing. Therefore, Chinese PSAs in mobile phones can use bass, dull, and smooth tones. In addition, the discovery of timbre elements is also related to the attention paid to colors and shapes in advertisements. Adeli, Rouat and Molotchnikoff (2014) found that soft tones lead viewers to focus on round shapes in blue, green, or light gray while sharp tones lead viewers to focus on sharp corners in red, yellow, or dark gray. Palmer, Schloss, Xu, and Prado-León (2013) found that faster-paced music matches more yellow (ie warmer) colors while music in minor mode has a higher correlation with blue. Few people may notice that voices of different genders also have different advertising effects. For example, Whipple and McManamon (2002) found that for neutral products, the gender of the announcer in the advertisement did not affect the evaluation of the advertisement. For female image products, the voice of female announcers has a stronger positive impact on the evaluation of advertisements. However, for products with a male image, the gender of the advertisement announcer did not affect the evaluation of the advertisement. Moreover, the accent is also an element that cannot be ignored in advertising. Morales, Scott and Yorkston (2012) found that when media content is played with non-standard but familiar accents, it can better attract the audience's attention and enhance their memory of the content. Therefore, as shown in Table 2.2, this study notes that the speed, pitch, accent, timbre, and gender of the voices in Chinese mobile phone PSAs can convey different messages and emotions to parents.



Table 2.

The impacts of different auditory elements in advertising

Element	Factors	Influential impact
Speaking rate Pitch	On the fast and slow pace	Fast: think of yellow (warm color)
	Frequency level	High: light-colored objects Low: dark objects
	High and low pitch	High: Smaller objects. Strong sense of ability Low: Larger objects. Strong explanation
	High and low volume	High: increase excitement Low: relax
Timbre	Soft and sharp tone	Soft: blue, green, light color, rounded shape Sharp: red, yellow, dark gray, sharp shape
Gender	different gender	Neutral products: different genders, the same effect Male products: different genders, the same effect Female products: different genders, different effects
Accent	Accent standard or not	Standard: preferred Non-standard but familiar accent: attract users' attention and improve memory content.

4.3 THE IMPACT OF MULTI-CHANNEL SENSORY INTERACTION ON USER EXPERIENCE IN ADVERTISING

The current information society has entered the era of digital multimedia. In addition to common visual and auditory presentations, multi-sensory interaction presentation is also a very important form of advertisement in the digital environment. Liu and Cheng (2018) mentioned that multi-sensory interaction is simply to mobilize our "five senses", unite our senses, and interact in multiple forms, giving an immersive illusion in the exhibition. Liu and Cheng (2018) explained the "five senses" of the human body are divided into sight, hearing, smell, taste, and touch. This kind of interactive, experiential exhibition breaks the single exhibition form in the past, which can easily enter the hearts of visitors.

Wanick *et al.* (2017) mentioned in the spiral brand experience concept that consumers' experience can be optimized through gamification and emerging technologies. There are already many brands that aim to create brand experience through gamification and advergames. For example, the slimming mineral water under the French mineral brand Contrex once did an outdoor game-type multi-sensory interactive advertising case. The advertiser connects





the bicycle to the LED display screen. When enough people ride bicycles to give the screen energy simultaneously, the extremely attractive and interesting pictures and music in the LED will appear.

In this case, various sensory methods were used, such as tactile, visual, and auditory. Through games, participants can fully enjoy the sense of pleasure in the experience process which is very attractive while outputting advertising information. O'Brien and Toms (2008) found that elements like having a sense of control, challenge, or aspects of novelty and feedback could enhance engagement in digital environments. For example, challenges in games are crucial to building engagement, whereas having a sense of control is strongly related to usability and user experience.

Moreover, the stickiness of the game in the mobile phone advertisement can make the audience fully immersed in the advertisement after experiencing emotional attachment (Brown & Cairns, 2004). For example, Gaming Multi-sensory interaction can play a certain role in attracting users' attention and triggering users' pleasant emotions in pre-shopping advertisements. It can also play a certain role in maintaining user experience after placing an order. Wanick *et al.* (2017) found that gamification could play a huge part in rewarding systems and loyalty programs which has a huge potential to keep the consumer engaged over a long period of time. Therefore, this study suggests multi-sensory interaction method as a fun interactive method in Chinese PSAs in mobile phones that could be used to attract parents' attention and maintain parents' experience before and after purchase.

In addition to the form of interaction, the content and duration of the interaction will also have different effects on the audience's emotional experience. According to research by Mahut, Bouchard, Omhover, Favart and Esquivel (2018), using personified interaction for online mobile phone advertisement design evokes more empathy and improves click-through performance. Empathy can enhance the positive impact by increasing the relevance between users and advertisements. Besides that, Bulkin and Groh (2006) also mentioned that the user experience impacts long-term emotions (e.g. peaceful, contemplative, longing, tired) more than interaction. That is to say, when the advertising content is expressed in a personalized way that meets



the needs of users, it can often better attract users' attention and empathy.

In summary, this study notes that gamified multi-sensory interactive Chinese PSAs can attract parents' attention by evoking joyful experiences, and the form and duration of interaction can trigger different emotions.

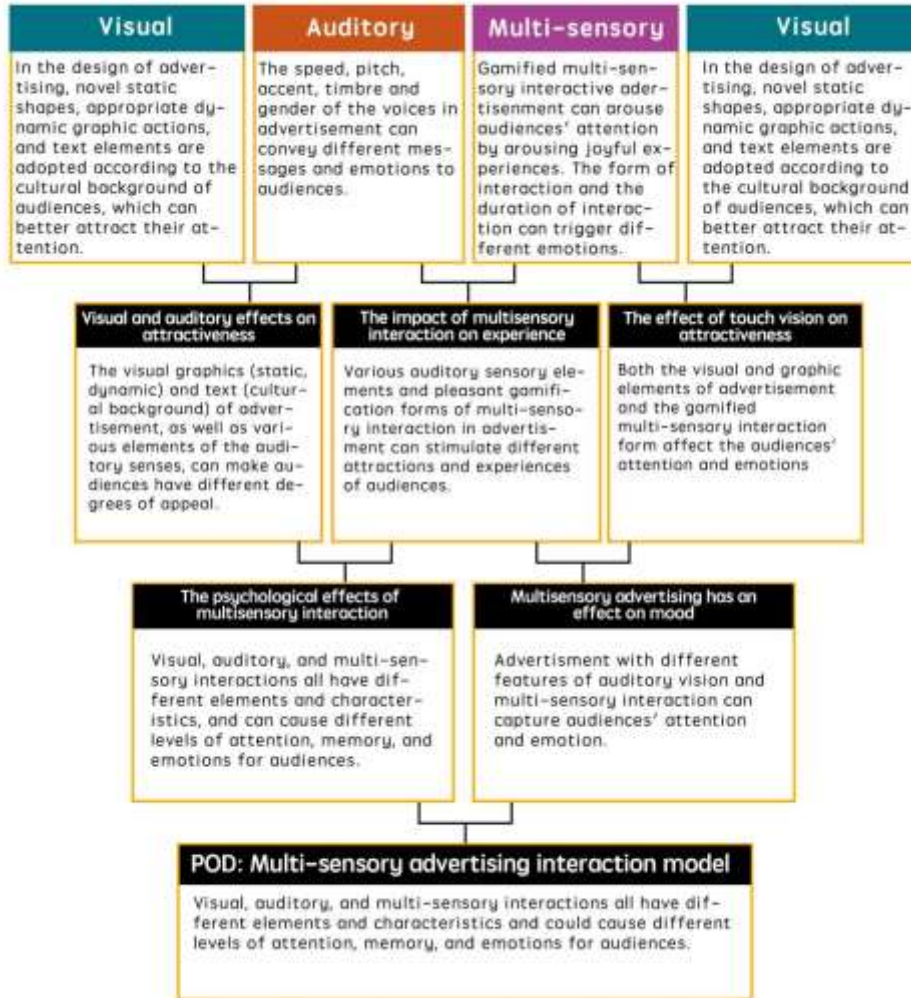
4.4 DEVELOPING MULTI-SENSORY ADVERTISING INTERACTIONS

Based on the literature review, this research sort out the multi-sensory advertising interaction model based on the Point of Departure (POD) Tree Diagram tools (Ibrahim, R & Mustafa Kamal, R, 2018), which aimed to analyze the impact of different interaction modes on the communication effectiveness of parenting advertising based on Sustainable Development Goal 3. Detailed information is shown in Figure 1.



Figure 1.

Point of Departure (POD) Tree Diagram of Multi-sensory Advertising Interaction Model.



Source: Adapted from Ibrahim, R., Mustafa Kamal, R. Templates for Thinking, 2018.

5 CONCLUSION

In this study, three keywords and three sub-themes were studied by way of the literature review synthesis process and concluded the multi-sensory advertising interaction model, which suggested that visual, auditory, and multi-sensory interactions all have different elements and characteristics, and can cause different levels of attention, memory, and emotions for users. This conclusion is expected to guide designers to pay attention to the impact of various sensory elements on users when designing advertisements and to choose





appropriate sensory forms and element expression methods according to the actual needs of the advertisement so that the advertising information can be more effective. The target parents of this study are busy grumpy parents. Their characteristics are that although they love their children very much, they lack some basic parenting knowledge and do not have much training time. Therefore, when designing parenting public service advertisements for them, designers need to use powerful methods to quickly attract their attention in a short time. For example, they could use some novel graphics to attract the attention of parents and use some shaking, fading, or Bouncing dynamic advertisements to arouse parents' feelings of anger, sadness, or fear, allowing them to understand the dangers of lack of parenting knowledge in an emotional state. In addition, this research helps to identify the experience characteristics of interactive sensory in advertisements, improve the effective dissemination of information, and guide public service advertisements to use effective sensory interactive methods. The results are expected to guide the future development of visual modules on parenting training for abusive parents and strive for a happier family atmosphere for children.

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