

3D holographic fan advertising and its influence on consumer attitudes and purchase intentions

submitted by

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DECLARATION

This serves to confirm that I, Mr Ripfalo Peace Hlungwani declare that this research report is my own work except as in the references and acknowledgements. It is submitted in partial fulfilment of the requirements for the degree of Master of Business Administration in the Graduate School of Business Administration, University of the Witwatersrand, Johannesburg. It has not been submitted before for any degree or examination in this or any other university.

Ripfalo Peace Hlungwani

Signed at Germiston

On the 18th day of February 2025

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ABSTRACT

The rise of holographic display technology in marketing communications has the potential to enhance consumer engagement by enabling realistic and interactive 3D experiences. However, limited research exists on consumer perceptions of 3D holographic fan advertising, particularly from a Global South perspective. This study examined how consumer attitudes and purchase intentions are influenced by 3D holographic fan advertising, using the Stimulus-Organism-Response (SOR) theory and the Advertising Value Model as theoretical foundations.

A quantitative approach was used, with data collected through a self-administered questionnaire using a mall-intercept method at points of experience in South African restaurants. A non-probability convenience sampling technique was used, yielding a sample size of 390 respondents.

The findings indicate that South African consumers have a positive reception towards 3D holographic fan advertising. Informativeness, entertainment, irritation, and credibility were identified as key predictors of consumer attitudes, with entertainment being the most valued factor. The results further revealed that informativeness and credibility are strong predictors of purchase intentions, while positive consumer attitudes towards the 3D holographic fan advertisements significantly influence purchase intentions.

This study contributes to marketing communication literature by bridging the gap between technological advancements and consumer preferences. It provides empirical insights to assist marketing professionals in integrating 3D holographic fan advertising into their strategic campaigns. Additionally, the study offers a Global South perspective, enriching the understanding of emerging consumer trends in digital advertising.

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CHAPTER 1: INTRODUCTION

1.1 Statement of Purpose

The use of hologram technology in advertising and its impact on consumer attitudes and purchase intentions is crucial and yet remains understudied. Emerging hologram technology offers an innovative way for consumers to visually interact with products and services (Verki & Piri, 2024). A study by Sadek (2019) found that the effective employment of hologram digital advertising has the potential to hold the attention of receivers. Moorchilot (2024) states that holographic display technology is expected to significantly impact advertising. Therefore, assessing consumer attitudes and behavioural intentions towards hologram advertising will form a foundation for their success in marketing communications. Consumer attitudes and purchase intentions are well-studied constructs in advertising, where various studies looked at media sources such as, amongst others; social media (Abbasi et al., 2023), mobile phones (Tsang et al., 2004), podcasts (Bezbaruah & Brahmbhatt, 2023), and print media (Saraiva & Lues, 2023). Understanding how consumer attitudes and purchase intentions are influenced by 3D (three-dimensional) holographic fan advertising will enhance knowledge and understanding of their potential use, with a focus on the South African market.

Advertising is an important concept in marketing communication; it is how companies communicate information about their products and services (Misra & Vashisth, 2017). Consumers absorb information differently from different advertising media (Misra & Vashisth, 2017; Saraiva & Lues, 2023). South African digital out-of-home (DOOH) practitioners indicate that there is a lack of adoption of three-dimensional (3D) technologies in advertising (Roux, 2018). Gavino (2013) indicates that the new and fast-growing 3D hologram fan technologies can be applied in advertising. Therefore, the purpose of this study is to assess the use of 3D holographic fan displays as an advertising medium. In this assessment, different advertisements will be displayed on the 3D holographic fan located at South African restaurants to determine consumer attitudes towards the advertising medium and its influence on purchasing intentions. The assessment will be conducted using a quantitative research method.

1.2 Background of the Study

1.2.1 South African Advertising Industry

The South African advertising industry is poised for steady growth, with an expected compound annual growth rate (CAGR) of 5.5%, according to an industry report by PriceWaterhouseCoopers (PwC) (2023). This growth is driven by expanding various media platforms, including traditional television, out-of-home displays, cinema, Internet advertising, Internet access, radio, print media, podcasts, and over-the-top services (PwC, 2023). A key factor contributing to this growth is the increasing accessibility of the Internet in South Africa, allowing more people to engage with digital platforms and subscription-based services (PwC, 2023). Statista (2024) estimated that advertising spending in the country would have reached \$2.155 million by 2024, highlighting the industry's financial expansion. Additionally, there has been a notable rise in influencer partnerships as brands seek to connect with digital-age consumers through social media and other online platforms (Statista, 2024). The continued adoption of emerging communication tools and digital strategies will be crucial in sustaining the growth of South Africa's advertising industry. As technology evolves, businesses and advertisers must adapt to changing consumer behaviours to maximise engagement and market reach.

1.2.2 Adoption of Marketing Communications Tools

Technological innovations have diversified marketing communications, shaping consumer behaviour. Kushwaha et al. (2020) advocate for the continuous adoption of modern marketing tools. South African advertising is categorised into four main formats: outdoor billboards, street furniture, transit and transportation, and place-based media (Roux et al., 2013). These formats can be static or digital. Kelsen (2012) predicts increased adoption of digital signage for indoor advertising. Globally, new technologies like augmented and virtual reality (Abbasi & Ali, 2020) and hologram technology (Barabas & Bove, 2013; Gavino, 2013; Haikuo, 2015) are entering the market.

1.2.3 3D Holographic Fans

Hologram technology, pioneered by scientist Dennis Gabor in the 1940s, has evolved into advanced 3D imaging today (Hussein et al., 2020), offering an immersive viewing

experience for consumers (Hussein et al., 2020). This technology can be applied as an advertising medium (Gavino, 2013; Sadek, 2019; Verki & Piri, 2024). Therefore, it is important to test how it influences consumer behaviour before it can be concluded that it is an effective way of communicating information.

1.2.4 Consumer Behaviour

Consumer behaviour is a well-studied concept in marketing. It deals with how consumers react in the market, looking at behaviour intentions, attitudes, habits, perceptions, and many other factors (Hyodo & Bolton, 2021; John et al., 2022; Nassè, 2021; Paz & Vargas, 2023). Advertising mediums tend to influence consumer behaviour (Khan & Ali, 2020; Wijaya, 2012), and effective advertising tends to influence positive consumer attitudes and purchasing intentions (Gazley et al., 2015; Lee et al., 2017; Spears & Singh, 2004).

1.3 Problem Statement

The DOOH advertising industry in South Africa has been slow to adopt 3D digital light projection technologies (Roux, 2018). While 3D holographic fan displays have been successfully applied in various fields (Haikuo, 2015), including advertising (Barnes, 2023; Verki & Piri, 2024), their impact on consumer attitudes and purchase intentions remains unexplored. Previous research has emphasised the importance of understanding consumer perceptions towards emerging advertising media (Van der Waldt et al., 2009), as consumer responses vary based on the platform used (Saraiva & Lues, 2023).

Despite the potential of 3D holographic fan advertising to create immersive and engaging brand experiences, there is a lack of research assessing its effectiveness in shaping consumer attitudes and influencing purchase decisions. Roux (2018) highlights the need for studies that examine consumer perceptions towards DOOH advertising, yet no research has specifically evaluated consumer responses to 3D holographic fan advertisements in the South African market. This gap in knowledge limits advertisers' ability to optimise marketing strategies and leverage innovative technology for enhanced consumer engagement.

This study assesses consumer attitudes and purchase intentions towards 3D holographic fan advertising. The research will provide valuable insights into its

effectiveness in influencing decision-making by analysing how consumers engage with and respond to this novel advertising medium. Understanding consumer attitudes can help businesses to develop more targeted and engaging advertising strategies, ensuring that marketing messages resonate with their intended audiences.

The findings of this study will contribute to the advancement of South Africa's digital advertising landscape, encouraging greater adoption of innovative technologies in marketing. Businesses will benefit from data-driven advertising strategies, leading to more effective consumer engagement and increased market competitiveness. Additionally, consumers may experience more interactive and visually appealing advertisements, enhancing their overall brand experience and satisfaction. Ultimately, this research will help to bridge the gap between technological advancements and consumer preferences, fostering a more dynamic and effective advertising industry.

1.4 Research Aim and Objectives (RO)

1.4.1 Aim

The study aims to assess 3D holographic fan advertising and its influence on consumer attitudes and purchase intentions.

1.4.2 Specific Objectives

To address the aim of the study, a set of specific objectives need to be addressed and are given below:

RO1: Determine to what extent the informativeness of advertisements displayed on a 3D holographic fan influences consumer attitudes.

RO2: Determine to what extent the entertainment of advertisements displayed on a 3D holographic fan influences consumer attitudes.

RO3: Determine to what extent the irritation of advertisements displayed on a 3D holographic fan influences consumer attitudes.

RO4: Determine to what extent the credibility of advertisements displayed on a 3D holographic fan influences consumer attitudes.

RO5: Determine to what extent consumer attitudes towards 3D holographic fans lead to purchasing intentions.

1.5 Research Questions (RQ)

A set of research questions will guide the study and are given below:

- RQ1: To what extent does the informativeness of advertisements displayed on a 3D holographic fan influence consumer attitudes?
- RQ2: To what extent does the entertainment of advertisements displayed on a 3D holographic fan influence consumer attitudes?
- RQ3: To what extent does the irritation of advertisements displayed on a 3D holographic fan influence consumer attitudes?
- RQ4: To what extent does the credibility of advertisements displayed on a 3D holographic fan influence consumer attitudes?
- RQ5: To what extent do consumer attitudes towards the 3D holographic fans lead to purchasing intentions?

1.6 Rationale of the Study

This study offers initial empirical evidence on consumer attitudes and purchase intentions towards 3D holographic fans as an advertising medium. This will inform brands about integrating 3D holographic fan technology into their marketing strategies. It addresses South Africa's limited and homogeneous digital media landscape noted by Roux et al. (2013). It explores how 3D holographic fan technology could diversify digital media offerings when adopted by the mainstream market. This study will also give an indication if this technology will be accepted by the general public, and attempt to popularise the use of this technology (Haikuo, 2015), primarily for marketing purposes.

1.7 Delimitations of the Study

This study will only focus on objectives aimed at stimulating consumer attitudes and behavioural responses such as purchasing, by using the advertising value model combined with Stimulus-Organism-Response (SOR) Theory (Dwinanda et al., 2022). Other potential effects such as brand awareness, capturing attention, and brand differentiation are not explored in this study. This study is limited to 3D holographic fan devices. This study will only focus on restaurants for the collection of data.

1.8 Assumptions

This study assumes that the participants have spent at least more than 30 minutes in the restaurant, and that they have engaged with the 3D holographic fan. Secondly, the participants will respond honestly and truthfully to the questionnaire. Lastly, the sample size will be sufficient to alleviate the subjectivity of the participants.

CHAPTER 2: LITERATURE REVIEW

2.1 Introduction

This section presents the literature to establish the empirical and theoretical foundation of the study, focusing on the chosen advertising medium and its marketing potential. It explores consumer attitudes towards various advertising mediums and their impact on purchasing intentions, aiding in the development of hypotheses and a conceptual framework for the study.

2.2 Background of the Study

2.2.1 Marketing

Marketing is a philosophy or activity that emphasises consumer satisfaction by creating and communicating products and services that bring value to consumers, partners and society (Lamb et al., 2020). Marketing plays a crucial role in a business; it seeks to improve sales and market share, introduce and promote new products and build relationships with consumers (Van Scheers, 2011). Marketing is required for the long-term success of the business. All business types (including small and medium enterprises (SMEs)) need a marketing function. A study by Van Scheers (2011) concluded that there is a high failure rate of small businesses that lack marketing skills and strategies. Therefore, every business needs a clear marketing strategy which defines their customer needs and groups, consumer needs changing, how they plan to compete with the existing competition and how they are going to manage marketing budgets (Palmatier & Sridhar, 2021). Once the marketing strategy is clearly defined, the business needs to develop a marketing mix that delivers value to all stakeholders.

2.2.2 Marketing Mix

The marketing mix model, initially coined as the '4Ps' includes the ingredients that marketing managers employ to position their products or offers in the market, to better address customer satisfaction and to achieve organisational goals (Jain & Jain, 2022). The 4Ps were further developed into what we know today as the '7Ps'. An article by Focus7 (2018) defines and explains the 7Ps, which stand for Product, Place, Price, Promotion, People, Process and Physical evidence.

Product refers to offering the right product for the right market segment to enhance sales (Focus7, 2018; Jain & Jain, 2022). **Place** ensures product availability through suitable sales channels, including e-commerce, to improve accessibility (Focus7, 2018; Novkovic, 2023). **Price** involves setting an appropriate cost to balance affordability and perceived quality (Novkovic, 2023; Jain & Jain, 2022). **Promotions** include advertising, discounts, and product samples to communicate benefits and influence purchasing behaviour (Sukanta et al., 2022). **People** represent employees who interact with customers, where professionalism and friendliness positively impact satisfaction, particularly in service industries (Elgarhy & Mohamed, 2023). **Process** focuses on operational efficiency to ensure timely production and delivery (Focus7, 2018). **Physical evidence** includes the environment and tangible aspects of a product that shape consumer perceptions (Jain & Jain, 2022). Together, these elements form the foundation of marketing strategies, enabling businesses to tailor their approach to different customer segments.

2.2.3 Marketing Promotional Tools

Globalisation and technological improvements have influenced the changes in which marketing managers communicate their products and services (Kallier-Tar, 2017). These improvements influence consumer behaviour in the market, and the need to react from managers is of paramount importance. Kushwaha et al. (2020) argue that the traditional integrated marketing communications (IMC) strategies need to account for generation-Z (people born between 1995 and 2010) by including digital media and social media as promotional tools. The traditional IMC tools consist of advertising, direct marketing, sales promotion, and public relations (Kushwaha et al., 2020). Advertising is effective in modern-day environments for the reason that it can reach mass and targeted audiences (Kushwaha et al., 2020).

2.2.4 Advertising

Advertising concerns itself with the promotion from the 7Ps marketing mix. Advertising aims to persuade consumer behaviour to buy a product (Khan & Ali, 2020; Wijaya, 2012). Its role has expanded to shaping brand equity, loyalty, and emotional connections (Kushwaha et al., 2020; Wijaya, 2012). With diverse mediums and locations, advertising is integral to communicating products and services effectively

(Kelsen, 2012; Roux et al., 2013). Managers must select appropriate promotional tools based on the target audience and context.

2.2.4.1 Advertising Media Platforms in South Africa

In a broader perspective, South Africa is an emerging market, and the advertising industry (based on media spend) is dominated by television (TV) and Internet advertising, followed by magazine, newspaper and books, music, radio, and podcasts (PwC, 2023). This study focuses on the out-of-home (OOH) segment which is predicted to grow by 1.4% annually to R3 billion by 2027 (PwC, 2023). The media outlook highlights the fact that OOH is still relevant in the market.

2.2.4.2 Digital OOH Advertising

The development of DOOH in the South African context is still in its infancy, and this is attributed to a lack of infrastructure, according to Roux (2018). Furthermore, in Roux (2018), practitioners state that the digital landscape is less sophisticated than in developed markets because of high technology costs and a lack of creative executions. Furthermore, there is a lack of technological adoption by advertisers; practitioners also mention that in the Global North, advertisers use 3D light projection and virtual reality technologies to communicate creative content with their audiences (Roux, 2018). Kelsen (2012) states that digital signage provides an opportunity for advertisers to provide creative content and communicate with a target audience at a specific location.

2.2.5 3D Holographic Fan Display Technology

The advertising industry has seen the introduction of various advertising mediums used to reach specific customer segments and mass audiences everywhere at all times (Van der Walddt et al., 2009). Barabas and Bove (2013) suggest that hologram technology has the potential to reproduce real scenes with high accuracy. With careful consideration, holographic displays will quickly enter the market and offer great experiences (Barabas & Bove, 2013). 3D holographic fan (Figure 2-1) technology was tested in the education sector, as per Ortega et al. (2020), enhancing classroom learning and student engagement. Peer-reviewed studies on 3D holographic fan use in marketing are lacking, although there are online sources that suggest its marketing potential (Hall, 2017). Following Roux et al.'s (2013) framework, this study applies 3D

holographic fan technology in niche, targeted place-based digital OOH advertising channels such as restaurants.

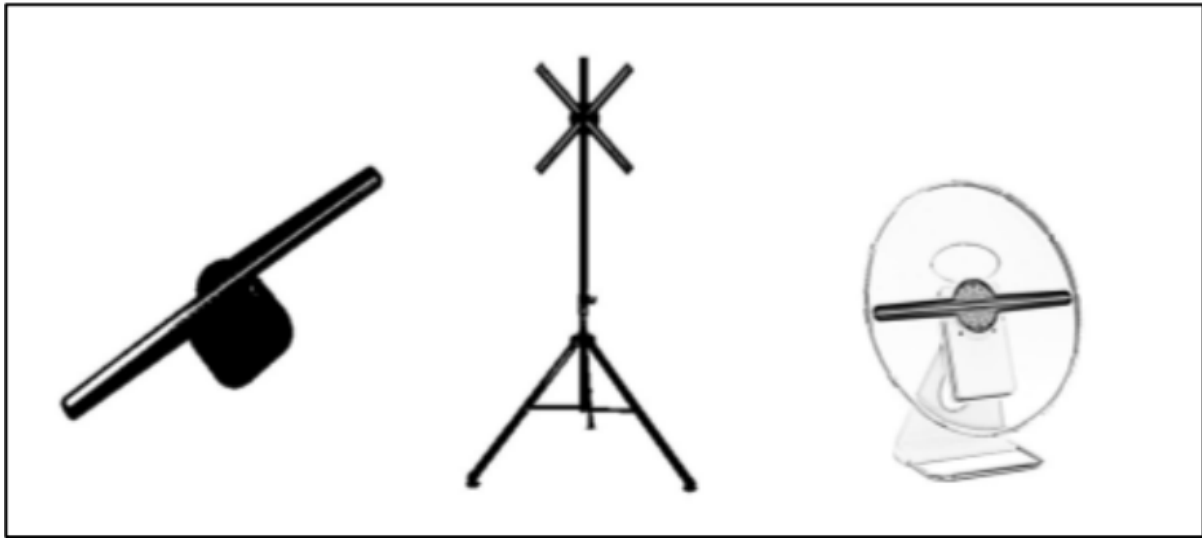


Figure 0-1: An image showing the holographic fan device and how it displays objects in 3D.
Source: Hussein et al. (2020)

2.2.6 Advertising Influence on Consumer Behaviour

2.2.6.1 Consumer Behaviour

Consumer behaviour is a complex and multi-faceted field of study that looks at how individuals and groups choose products and services to satisfy their needs, wants and lifestyles (Mothersbaugh & Hawkins, 2016; Nassè, 2021). Consumer behaviour also looks at processes and factors involved that influence consumer decision-making (Mothersbaugh & Hawkins, 2016). Paz and Vargas (2023) studied the evolution of models that explain consumer behaviour in different settings, themes and perspectives. The study shows various approaches that can be adopted to explain the influence of economic factors, psychological factors, and personal and social factors (Paz & Vargas, 2023). Recent studies show that there is a huge impact on consumer behaviour influenced by technological advancement (Meteab et al., 2020). Consumer behaviour can also be explored based on themes, as presented by Lim et al. (2022), in their study that reviewed major themes in consumer behaviour studies which include consumer information processing, consumption communities, consumption value, sustainable consumption and consumer ethics amongst others. Although there are many approaches and models to explain how consumers behave, this study adopts the basic consumer behaviour model as presented by Mothersbaugh and Hawkins (2016); refer to Figure 2-2.

2.2.6.2 Factors Influencing Consumer Behaviour

Consumers are unique in how they see themselves and how they want to live their lives, and they have different needs and desires. This is expressed in the consumer behaviour model by Mothersbaugh and Hawkins (2016). The uniqueness of consumer behaviours stems from the external and internal influences as described by traditional theories (Mothersbaugh & Hawkins, 2016). Marketers who understand how these factors can drive the motives of their customers are most likely going to influence their behaviour and subsequently have a well-defined marketing strategy for various groups and their needs (Kumar et al., 2022). A model by Mothersbaugh and Hawkins (2016) looks at the relationship between factors that influence behaviour and consumer lifestyle, self-concept and the process involved that leads to decision-making.

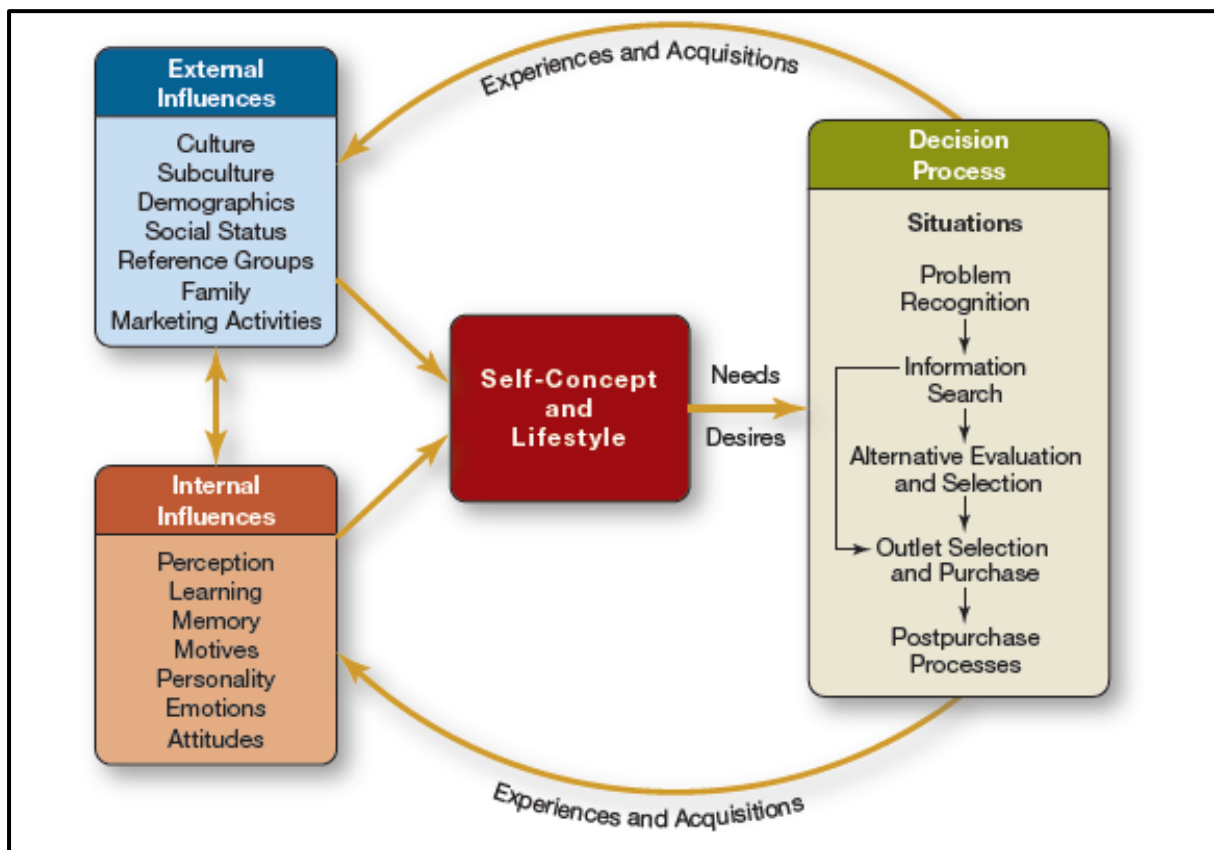


Figure 0-2: Consumer behaviour model.

Source: Adapted from Mothersbaugh and Hawkins (2016).

External factors aid marketers in their segmentation process (Vasylchenko, 2020). It states that consumers behave differently based on their biological status (genders), social status (family, groups and culture), demographics (age groups and ethnic groups) and economic status (buying power) (Vasylchenko, 2020). Other external

factors may include religious influences. A study by Tuhin et al. (2020) is a perfect example of religious influences on the Islamic community and their preference to buy halal products. Technological factors have impacted how consumers behave, as they require services or products that are easily accessible, fast and easy to use (Jose, 2017; Suherlan & Okombo, 2023). There is also a rise in studies that seek to explain online consumer behaviour (Cahyani & Artanti, 2020; Meteab et al., 2020).

Internal factors involve the psyche of an individual; the factors recognise that consumers have different cognitive processes (Lichev, 2017; Minchekar & Mangore, 2022). Perception to rationalisation is considered to be an important factor in aiding consumer behaviour. It refers to how information is perceived, analysed, interpreted and categorised; consumers further adjust the incoming information to their individual needs (Lichev, 2017). Learning is an important factor that influences consumer behaviour; it refers to the consumer experience of the service or product. The experience can be gained through social learning (word of mouth), and classical or instrumental conditions (Minchekar & Mangore, 2022). Attitude, which has a cognitive component, refers to how an individual feels about a product or an object (affective), how they think about an object (cognitive) and how they would act towards an object or product (behavioural / conative) (Mothersbaugh & Hawkins, 2016). The internal factors seek to address elements that motivate, such as motives and needs; furthermore, they consider stimuli (Lichev, 2017). Lichev (2017) points out that the factors do not act independently; they depend on one another, although some factors may weigh greater compared to others and this is what differentiates consumer behaviours.

2.2.6.3 Consumer Decision-making Process

Marketers invest significant time and money in segmenting consumers and understanding their thoughts and behaviours, all to influence their decision-making process that leads to a purchase. Every consumer is faced with a decision to make, and the studies have documented an extended problem-solving task which involves the following steps: problem recognition, search for information to evaluate, evaluate alternatives, purchase and post-purchase processes (Mihart, 2012; Mothersbaugh & Hawkins, 2016; Suherlan & Okombo, 2023). Before any decision can be taken, the consumer must need to satisfy a specific desire or need (Mothersbaugh & Hawkins, 2016). The next step involves reviewing information from memory, such as known

knowledge about the product or service and past experiences (Mothersbaugh & Hawkins, 2016). External information search mostly occurs when consumers do not have experience with the product or service, they look at other sources of information relevant to the product that they want to purchase. An example of external information includes evaluating consumer reviews on online platforms (Lim et al., 2022). Consumer choice becomes relevant during the process of making a decision. Consumer information also reviews alternative options (Mothersbaugh & Hawkins, 2016). The ultimate goal of the process is to satisfy a need or solve a problem by making a purchase. The post-purchase looks at whether the consumer was satisfied or dissatisfied with the product or service, whether their needs were met or not and moreover, if the consumer will repurchase or recommend the product to others (Suherlan & Okombo, 2023).

2.2.6.4 The Role of Advertising on Consumer Behaviour

Advertising is a form of marketing activity that seeks to provide stimuli or information to segmented consumers. Advertising aims to have an impact on psychological factors such as motivations, perceptions and attitudes (Kumar, 2015). Advertising seeks to appeal to consumer needs or motivations to satisfy certain desires. Advertising aims to position products in a way that meets consumer perceptions (Kumar, 2015). Attitude becomes very important, as it depicts the behaviour of consumers regarding a selection of a particular brand or service. Advertising can influence the attitudes of consumers towards a particular object (Kumar, 2015). Advertising becomes crucial in providing information to consumers during the information review step in the decision-making process; a well-communicated product or service may lead to consumers making a purchase.

2.3 Theoretical Framework

Consumer attitudes towards advertising mediums are crucial indicators of their success (Cheng et al., 2009; Eze & Lee, 2012; Du Plooy & Du Plessis, 2011; Phillips & Noble, 2007; Van der Walddt et al., 2009), aiding advertisers in selecting appropriate vehicles (Ducoffe, 1995). Negative perceptions may exist towards certain mediums like cinema advertising (Phillips & Noble, 2007), while positive consumer attitudes often correlate with purchasing intentions (Cahyani & Artanti, 2020). This study uses the Stimulus-Organism-Response Theory coupled with the advertising value model.

2.3.1 Stimulus-Organism-Response (SOR) Theory

The SOR Theory is a framework that explains how external factors influence consumers' internal state and behaviour. It is widely used in consumer behaviour studies (Erensoy et al., 2024). This theory was first introduced by Mehrabian and Russell (1974), where they posit that there are environmental or external influences; that is, stimuli (S) that motivate an internal state of the consumer; an Organism (O) to react, respond or behave in a certain way; a response (R). Advertising provides stimuli (S) by providing information about products and services, which may lead to a positive or negative attitude (O) and subsequently lead to behavioural response (R) such as purchase intentions (Dwinanda et al., 2022). The SOR framework is relevant to this study because it explains how advertising content (stimulus) can trigger internal psychological processes (organism), which then influence an individual's response or behaviour. This helps show how the theory supports the idea that advertising can shape consumer attitudes and lead to specific actions.

2.3.2 Advertising Value Model

This study follows the advertising value model coined by Ducoffe (1995) and later modified by Brackett and Carr (2001) by adding credibility as an antecedent variable for consumer attitudes towards advertising. This model forms the theoretical framework of this study. This model is still relevant and applied in modern forms of advertising (Abbasi et al., 2021; Bezbaruah & Brahmabhatt, 2023). The theory states that informativeness, entertainment, and credibility positively influence consumer attitudes, and irritation negatively influences consumer attitudes (Brackett & Carr, 2001). Many authors have found that entertaining, informative and credible advertisements have positive influences on consumer attitudes and lead to positive influence towards the brand and advertising medium (Cheng et al., 2009; Saraiva & Lues, 2023; Tsang et al., 2004; Van der Walddt et al., 2009). Irritation is still debated in literature as a variable for advertising value with authors such as Logan et al. (2012) disproving that irritation impact advertising value, while more recent studies still consider irritation as a relevant antecedent for advertising value (Abbasi et al., 2021). This theory is appropriate for this study as antecedent variables to be tested influences consumer attitudes.

2.4 Hypothesis Development

2.4.1 Consumer Attitudes

Attitude is an important and pivotal construct in marketing research (Mitchell & Olson, 1981), especially in assessing perceptions towards advertising mediums before their effective use (Van der Walddt et al., 2009). This study follows Mitchell and Olson's (1981) definition of attitude as "an individual's internal evaluation of an object," (p. 318). Commonly used attitudinal forms in consumer attitude literature include informativeness, entertainment, irritation, and credibility (Cheng et al., 2009; Saraiva & Lues, 2023; Tsang et al., 2004; Van der Walddt et al., 2009), which will be adopted in this research. This work follows the SOR framework process flow whereby the attitudinal forms provide stimuli to shape consumer attitudes.

a) Informativeness

Informativeness depicts the ability of the advertiser to effectively communicate information that represents a true picture of the brand or a product (Ducoffe, 1995; Van der Walddt et al., 2009). Advertisers should know that information from different advertising mediums is processed differently (Saraiva & Lues, 2023). There are several studies, such as Cheng et al. (2009), Ducoffe (1995), Saraiva and Lues (2023), and Van der Walddt et al. (2009), which illustrate that the information displayed has a positive impact on the consumer attitudes towards the brand or the medium used. Most recent studies look at social media as a promotional tool. Abbasi et al. (2023) conducted a study on social media images, and they found that consumers perceived these images as informative, thereby adding to the advertising value. Mahmut et al. (2022) looked at the use of social media for a Turkish airline and they found that informativeness has a positive relationship to advertising value, subsequently influencing positive consumer attitudes. Recent studies have looked at podcast advertisements. Bezbaruah and Brahmabhatt (2023) had a similar conclusion regarding the informativeness of podcast advertisements. Saraiva and Lues (2023) confirmed that print media such as magazines is still considered as informative and has a positive relationship to consumer attitudes. Not all advertising platforms consider informativeness as significant in influencing consumer attitudes. A study by Abbasi et al. (2021) proved that informativeness on online gaming pop-up advertisements was not significant in influencing advertising value. With 3D holographic fan advertising

becoming popular, we do not know how the information displayed affects consumer's attitudes. As such, the present study hypothesises the following:

H1: The informativeness of the 3D holographic fan will have a positive relationship with consumer attitudes.

b) Entertainment

Entertainment is the ability of the advertiser to display information in a way that consumers are going to enjoy. Studies from Brackett and Carr (2001), Cheng et al. (2009), Ducoffe (1995), and Van der Waladt et al. (2009) concluded that entertainment has a positive impact on consumer attitudes. Similarly, Van der Waladt et al. (2009) concluded that there is a positive correlation between consumer attitudes and entertainment; however, advertisers need to further explore the entertainment value. A study by Disastra et al. (2018) found that mobile advertising entertainment value has no significant influence on consumer attitudes, whereas a study by Abbasi et al. (2021) found that online gamers perceived advertising entertainment to positively influence consumer attitudes. Saraiva and Lues (2023) found that Gen-Y (those born between 1982 and 1994) consumers perceived magazines to be more entertaining than flyers. In their study, Mahmut et al. (2023) found that social media images were entertaining and positively influenced advertising value. A similar outcome related to podcast advertising was found by Bezbaruah and Brahmbhatt (2023). However, we do not know if 3D holographic fan advertising is perceived as entertaining. As such, this present study hypothesises that:

H2: Entertainment displayed by the 3D holographic fan will have a positive relationship on consumer attitudes.

c) Irritation

Irritation is dependent on how the consumer perceives the information. Some consumers perceive advertisements to be annoying and manipulative, and in some cases, advertisements may insult or offend consumers (Ducoffe, 1995; Mdlongwa, 2020). Irritation also extends to the type of advertising medium used. Van der Waladt et al. (2009) found that short message service (SMS) advertising is perceived to be very irritating, whereas Saraiva and Lues (2023), found that consumers do not find print advertising irritating. In general, literature associates irritation with a negative

correlation to consumer attitudes (Brackett & Carr 2001; Cheng et al., 2009; Ducoffe, 1995; Van der Waladt et al., 2009). The social media study by Mahmut et al. (2022) was unable to demonstrate that irritation had an impact on advertising value. Abbasi et al. (2021) found that pop-up advertisements negatively affect consumer attitudes following the general sentiment that pop-ups are interruptive. It is clear that consumers perceive irritation differently from different media; therefore, it would be most appropriate to see how 3D holographic fans are perceived when it concerns irritation. Therefore, the present study hypothesises the following:

H3: 3D holographic fan advertising will be less irritating and have a negative correlation to consumer attitude.

d) Credibility

Credibility has been defined in the context of how the consumer sees the advertisement displayed as believable and truthful (MacKenzie & Lutz, 1989; Martins et al., 2019). It is also considered as an important factor that influences consumer attitudes (Abbasi et al., 2021). Several studies have concluded that the credibility of the advertisements have a positive impact on consumer attitudes (Abbasi et al., 2021; Martins et al., 2019; Saraiva & Lues, 2023). Abbasi et al. (2021) found that when in-game pop-up advertisements are tailored to the needs and wants of the gamers, game pop-up advertisements can be seen as credible, and this positively influences consumer attitudes. Martins et al. (2019) looked at smartphone advertisements and they found that information from smartphone advertisements are perceived to be credible and positively influences consumer attitudes. Print media is still considered as a credible source of information (Saraiva & Lues, 2023). We do not know if consumers consider 3D holographic fan advertising a good source of credible information. As such, the present study hypothesises that:

H4: Advertisements displayed from the 3D holographic fans are credible and will have a positive correlation on consumer attitudes.

2.4.2 Purchase Intentions.

Spears and Singh (2004) defined purchase intention as “an individual's conscious plan to make an effort to purchase a brand” (p. 56). This definition is adopted for this study because it clearly depicts that purchase intentions are subjective in nature; allowing

consumers to have an opinion based on how they perceive advertisements. The relationship between attitudes and intentions have been theories by the SOR framework. Research by Yaacob and Baroto (2019) suggests that while attitude does not always directly correlate with purchase intention, it remains a factor. Misra and Vashisth (2017) examined predictors of consumer preferences for advertising mediums and their impact on consumer attitudes, which in turn affect purchase intentions. Advertisers should consider how the medium conveys information and its effect on consumer purchase intention (Misra & Vashisth, 2017). A study by Disastra et al. (2018) found that mobile advertising attitude strongly influences purchase intentions. The podcast study by Bezbaruah and Brahmbhatt (2023) found that consumer attitudes towards podcast advertisements had a positive influence on attitudes towards the brand and subsequently had a positive influence on purchase intentions. Similar conclusions have been published by various authors studying various promotional tools such as TV soap-branded content (Mwali, 2016); email marketing (Cahyani & Artanti, 2020); and celebrity endorsements (Redda & Shezi, 2022). Although, on the contrary, a study by Macheke et al. (2023) found that positive consumer attitudes from celebrity endorsement do not always support purchase intentions. Therefore, managers need to assess the type of promotional tools that they use to influence purchase intention. At this stage, it is unknown what the relationship is between 3D holographic fan advertising influence on consumer attitudes and purchasing intention. Therefore, this present study hypothesises that:

***H5:** Positive attitudes towards advertisements displayed in the 3D holographic fan will positively correlate with consumer purchase intentions.*

2.5 Measuring Attitudes and Purchase Intention

Many theoretical paradigms have been adopted by prior studies on consumer attitudes and purchase intention (Spears & Singh, 2004). The current challenge with measuring these constructs is that most studies have treated these two as theoretical and empirically distinct; however, studies have found that consumer attitudes and purchase intentions are highly correlated, which signifies that they are not that empirically distinct (Spears & Singh, 2004). This study by Spears and Singh (2004) tried to address the issues of measuring attitudes and purchase intentions. In their study, they found that attitudes and purchase intentions exist as separate but

correlated dimensions. For this study, this approach is adopted to test the relationship between consumer attitudes and purchase intentions.

2.5.1 Measuring Attitudes

Measuring consumer attitudes involves assessing face validity using multiple statements, where participants self-administer their responses. A significant challenge in attitude measurement lies in selecting appropriate statements and scaling responses effectively (Krosnick et al., 2005). Several scholars have developed measurement models or techniques to facilitate the measurement of attitudes, including Thurstone (1928), Likert (1932), and Osgood et al. (1957). These techniques are advantageous, as they reduce measurement errors and can be constructed using empirical evidence, such as the convergence of interpretation across individuals and the correlational validity of statements (Krosnick et al., 2005).

The Likert scale was specifically designed to measure attitudes in a scientifically validated manner. It presents participants with real-world or hypothetical scenarios and asks them to indicate their level of agreement or disagreement (Joshi et al., 2015). Responses are typically measured on a five-point or seven-point scale, where '1' represents 'strongly disagree' and '5' or '7' represents 'strongly agree.' The choice of scale format depends on the study's objectives, as well as the reliability and validity of the items being assessed (Joshi et al., 2015). Final scores are then used to evaluate participants' behaviours or preferences concerning the tested items. This study will adopt the Likert scale to measure attitude.

2.6 Conceptual Framework

The study's conceptual framework, drawn from Disastra et al. (2018), examines the relationship between consumer attitudes and independent variables: informativeness, entertainment, irritation. The model was modified to include credibility as an independent variable. It shows that informativeness (H1), entertainment (H2), irritation (H3) and credibility (H4) have an impact on consumer attitudes. It also shows that consumer attitudes (H5) will have an impact on purchasing intentions (Figure 2-3).

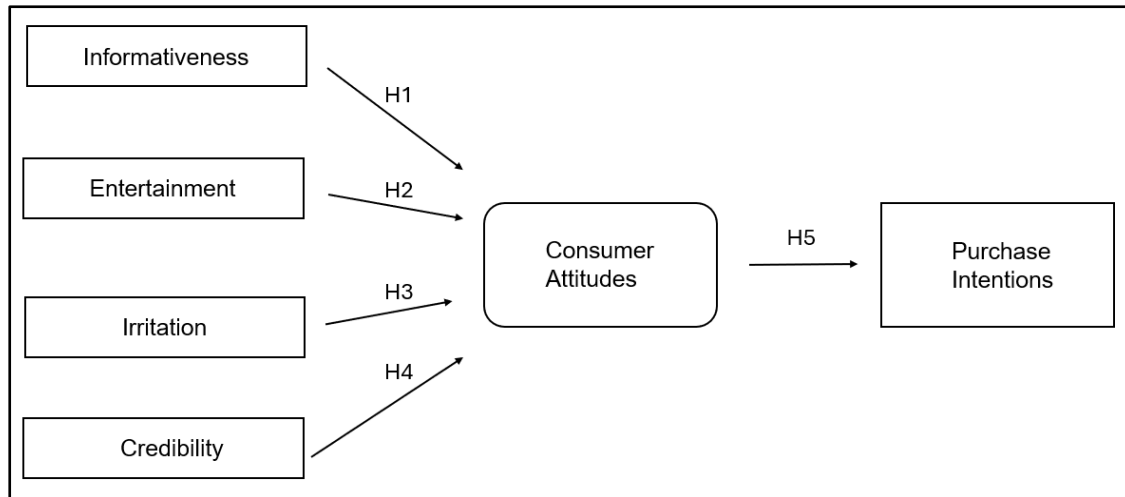


Figure 0-3: Proposed conceptual model for this study.
Source: Adapted and modified from Disastra et al. (2018).

2.7 Conclusion of Literature Review

The adoption of 3D holographic fan technology is forthcoming in the marketing and advertising sector. This study leads the way in determining the influence of this device on consumer attitudes and purchase intentions. The literature highlighted the importance of measuring these constructs towards advertisements from different mediums (Brackett & Carr 2001; Cheng et al 2009; Ducoffe, 1995; Gazley et al. 2015; Lee et al., 2017; Spears & Singh 2004; Van der Walddt et al., 2009) and the outcome of these results will provide a clear indication of the success of these devices in the advertising market. Therefore, this study aims to apply the same approach to identify how 3D holographic fans as a medium influence consumer attitude, by looking at the four attitudinal forms, and the influence of consumer attitudes and purchase intentions.

CHAPTER 3: METHODOLOGY

3.1 Introduction

This study followed the positivist research paradigm, using the quantitative approach used in similar studies (Mkhize, 2017; Redda & Shezi, 2023; Saraiva & Lues, 2023). This approach has produced reliable results when testing relationships between variables using statistical methods. The research approach was highly appropriate for this study because it was suitable for testing hypotheses and determining attitudes and behavioural actions of a larger population.

3.2 Research Design

Data collection was through a self-administered questionnaire distributed via a mall-intercept approach. This approach was suitable because 3D holographic displays are uncommon in public spaces and most participants were unfamiliar with this type of advertising. Therefore, participants were given an opportunity to experience 3D holographic fan advertising before completing the questionnaire. This approach has been used in studies where the participants were approached at a point of experience (Ramnas Babu & Prashant, 2023; Khan et al., 2020; Saraiva & Lues, 2023).

Bush and Hair (1985) state that the mall-intercept approach encourages thorough and accurate responses from participants, potentially yielding a high response rate. Hasan (2024) highlights its drawback that it can be time-consuming and costly because of document administration.

3.3 Population and Sampling

3.3.1 Population

The population of this study were restaurant customers, who had interacted with the 3D holographic fan device. Preferably, the customers were South Africans between the ages of 18 and 65.

3.3.2 Sample and Sampling Method

The study used non-probability convenience sampling because of the accessible and general population (Pace, 2021), allowing the selection of participants who met the

criteria. This method, noted for its time and cost-effectiveness by Pace (2021), mitigates concerns about subjectivity by its general approach. It also supports the generalisability of potential outcomes.

The sample size was determined using a mathematical calculation which used the following few parameters (1) population size, (2) confidence levels, and (3) margin of error. The population size was obtained online focusing on the city (Ekurhuleni) in which the restaurant was located. The acceptable confidence level of 95%, as suggested by Sathyanarayana et al. (2024), was adopted. A margin of error of 5% was adopted because this research was social in nature.

Using the online tool from Qualtrics, and a figure of 4,066,691 total population of Ekurhuleni in 2022, the estimated sample size was 385.

3.4 Research Instrument

The instrument used a five-point Likert scale to measure responses from participants. Statements that were deemed relevant for the study were adapted from prior studies (Abbasi et al., 2021; Alalwan, 2018; Brackett & Carr, 2001; Bezbaruah & Brahmbhatt, 2023; Martins et al., 2019; Rausch & Kopplin, 2021) focusing on similar variables. The statements are presented in Table 3-1. The questionnaire is subdivided into three sections (Appendix I).

Section A: Screening questions

This section screens out non-intended participants.

Section B: Consumer Attitudes

This section assesses how 3D holographic fan advertising influences consumer attitudes by examining attitudinal forms categorised as informativeness, entertainment, irritation, and credibility. This section also assesses consumer attitudes.

Section C: Purchase Intentions

This section assesses how 3D holographic fan advertising influences consumer purchasing intentions.

The following instrument (Table 3-1) has been adapted and modified to be specific to 3D holographic fan advertising to assess the attitudes and purchase intentions.

Table 0-1: Construct instrument for testing consumer attitudes and purchase intention.

Construct	Label	Item question	References
Informativeness			
	INF1	3D holographic fan advertising provides timely information on products or services	Martins et al. (2019)
	INF2	3D holographic fan advertising provides relevant information on products or services.	
	INF3	3D holographic fan advertising is a good source of information	
	INF4	3D holographic fan advertising provides up-to-date products or services information.	
Entertainment			
	ENT1	3D holographic fan advertising is interesting.	
	ENT2	3D holographic fan advertising is enjoyable	
	ENT3	3D holographic fan advertising is entertaining	
	ENT4	3D holographic fan advertising is pleasing.	
Irritation			
	IR1	3D holographic fan advertising is irritating.	
	IR2	3D holographic fan advertising is annoying.	
	IR3	3D holographic fan advertising is intrusive	
Credibility			
	CR1	3D holographic fan advertising is convincing.	
	CR2	3D holographic fan advertising is believable.	
	CR3	3D holographic fan advertising is credible.	
	CR4	3D holographic fan advertising is a good reference for purchasing products	
Attitude towards holographic fan advertng			
	ATT1	I like 3D holographic fan advertising	Bezbaruah & Brahmbhatt (2023)
	ATT2	I feel 3D holographic fan advertising is good	
	ATT3	3D Holographic fan advertising is creative	
Purchase intention			
	PI1	I will buy products that are advertised on the 3D holographic fan	Alalwan (2018)
	PI2	I intend to buy products that are promoted on the 3D holographic fan	Rausch & Kopplin (2021)
	PI3	I am likely to buy products that are promoted on the 3D holographic fan	Alalwan (2018)
	PI4	I will strongly recommend others to purchase product/service advertised on the 3D holographic fan.	Martins et al. (2019)

Source: Author's conceptualisation

3.5 Pilot Study

A pilot study was performed to determine the feasibility and reliability of the measurement instrument and to assess the overall method of the study. Furthermore, the instrument was accessed to check if it addressed the variables and to test the hypotheses. The instrument was assessed for indicator reliability by checking the factor loadings. This was followed by determining the construct reliability by testing the Cronbach's alpha (CA), and the composite reliability (CRe). The instrument was also tested for convergent validity by testing for average variance extracted (AVE) and discriminant validity. The second part of the pilot study was to test the structural model and hypotheses testing using IBM® SPSS® Amos™ 29.0.

3.5.1 Data Collection

The questionnaires were distributed to a total of 65 participants; two responses were returned incomplete, thus 63 were eligible for the pilot study. The sample included restaurant customers, and they were selected on the basis that they spent at least 30 minutes in the restaurant, and that they were seated in an area where they could interact with the 3D holographic fan advertising device. The sample was limited to people between the ages of 18 and 65. The questionnaire took between 5 and 10 minutes to complete. The purpose of the study was explained to participants and the participants consented to participate in the questionnaire.

3.5.2 Data Processing

All 63 responses were processed. The data was entered into a Microsoft Excel spreadsheet for coding and the coded data was imported into the IBM® SPSS® Amos™ 29.0 software.

3.5.3 Pilot Study Results

A confirmatory factor analysis was performed using multi-factor path diagrams to obtain standardised factor loadings. The results show that the loadings were greater than 0.6, indicating that indicator reliability was achieved. In SPSS®, Cronbach's alpha was tested for all variables and the results showed that reliability was achieved with values being greater than 0.8. Composite reliability was achieved with values being greater than 0.8. Convergent validity was tested using the average variance extracted (AVE) being greater than 0.5. Discriminant validity was tested by using the Fornell-

Larcker criterion (Fornell & Larcker, 1981), which states that the root square of AVE must be greater than any correlation of the variables. The root square of AVE for informativeness was less than the correlation value of credibility and confirmed that there is a discriminant validity issue.

After further investigation, it was found that item INF4 had the lowest factor loading, and it had a strong correlation with credibility. The correlation was evident from the matrix, which led to informativeness and credibility correlations being greater than the square root of AVE, leading to discriminant validity. Therefore, a confirmatory factor analysis was performed without item INF4. Standardised factor loadings were greater than 0.7, Cronbach's alpha greater than 0.8, composite reliability was greater than 0.8 and AVE was greater than 0.6. Discriminant validity was also achieved. The measurement model proved to be successful, and it was sufficient to continue with final data collection. Detailed results of the pilot study are presented in Appendix II.

3.6 Data Analysis Strategies and Interpretation

Data from this research was analysed using IBM® SPSS® Amos™ 29.0, a widely used software in marketing and consumer research (Alalwan, 2018; Mdlongwa, 2020; Mkhize, 2017; Saraiva & Lues, 2023). Raw data underwent thorough scrutiny to ensure accurate coding and readability. Cleaned, coded data was then transferred to Excel and imported into the statistical software.

The following analysis was performed.

1. Reliability analysis: to assess the reliability of the scales and items used to measure the constructs. This analysis was conducted using Cronbach's alpha, bearing in mind the acceptable values greater than 0.7 but less than 1 (Taber, 2017).
2. Confirmatory factor analysis (CFA): to assess the measurement model by using a multi-factor path diagram to obtain factor loadings for indicator reliability. The loadings were used to calculate composite reliability, the average variance extracted and discriminant validity.
3. Descriptive analysis: to describe the perceptions or attitudes of consumers towards the independent variables assessed.
4. Structural Equation Model for hypothesis testing.

3.7 Limitations

This study was conducted in a restaurant located in the City of Ekurhuleni, Gauteng; therefore, it did not cover the whole of South Africa.

The study could not conduct other forms of collecting data such as online surveys, because the 3D hologram technology is relatively new on the market and many participants are unfamiliar with this type of advertising. Hence, the approach is a mall-intercept at point of experience.

3.8 Quality Assurance

3.8.1 External Validity

The researcher was present at the premises where questionnaires were handed out, to provide clarification if needed, reducing the likelihood of questionnaire misunderstanding. Using a non-probability sampling approach enabled broader participation and enhanced the study's generalisability.

3.8.2 Internal Validity

Internal validity, as defined by Zohrabi (2013), assesses the alignment of study findings with reality and the researcher's intentions. While the self-administered questionnaire method may have posed limitations to internal validity, the researcher maintained non-judgemental, truthful, and ethical conduct during data collection and analysis. Additionally, the questions used were adapted from previous studies that assessed the same variables.

3.8.3 Reliability

The study's repeatability, consistency, and dependability were ensured through the chosen quantitative approach, which involved gathering numerical data (Zohrabi, 2013). The researcher provided thorough explanations to ensure understanding, while participants were encouraged to provide honest and independent responses. Additionally, the method was clearly outlined, allowing for potential replication.

3.9 Ethical Considerations

Permissions: The researcher obtained a letter of acknowledgment from the restaurant owners.

Participation information sheet: all participants were informed about the research, and its purposes and their right not to participate (Appendix III).

Consent form: all participants were given a form to consent to their participation in the research (Appendix IV).

Participants: Vulnerable categories were not part of the study. Questionnaires were distributed to people over the age of 18 and under the age of 65.

Ethics clearance from the university: the research commenced with data collection once the University was satisfied with the ethics considerations of the study.

CHAPTER 4: RESULTS

4.1 Introduction

This section presents the results and findings of the data collected. A total of 401 questionnaires were distributed to participants, but only 390 responses were used for this study. The remaining 11 responses were excluded because they were incomplete or incorrectly filled out. This chapter examines the outcomes of the study in relation to the sections of the questionnaire as referred to in Chapter 3.4.

4.2 Sample Characteristics

4.2.1 The Age Group of Participants

All participants were requested to select their age group. The results indicate that the sample's age distribution was fairly representative across all age groups. The 18 to 25 age group accounted for 20% of participants; the 26 to 35 age group made up the majority at 30.26%, followed by the 36 to 44 age group at 25.13%, and finally, the 45 to 64 comprised 24.62% of the participants (Figure 4-1).

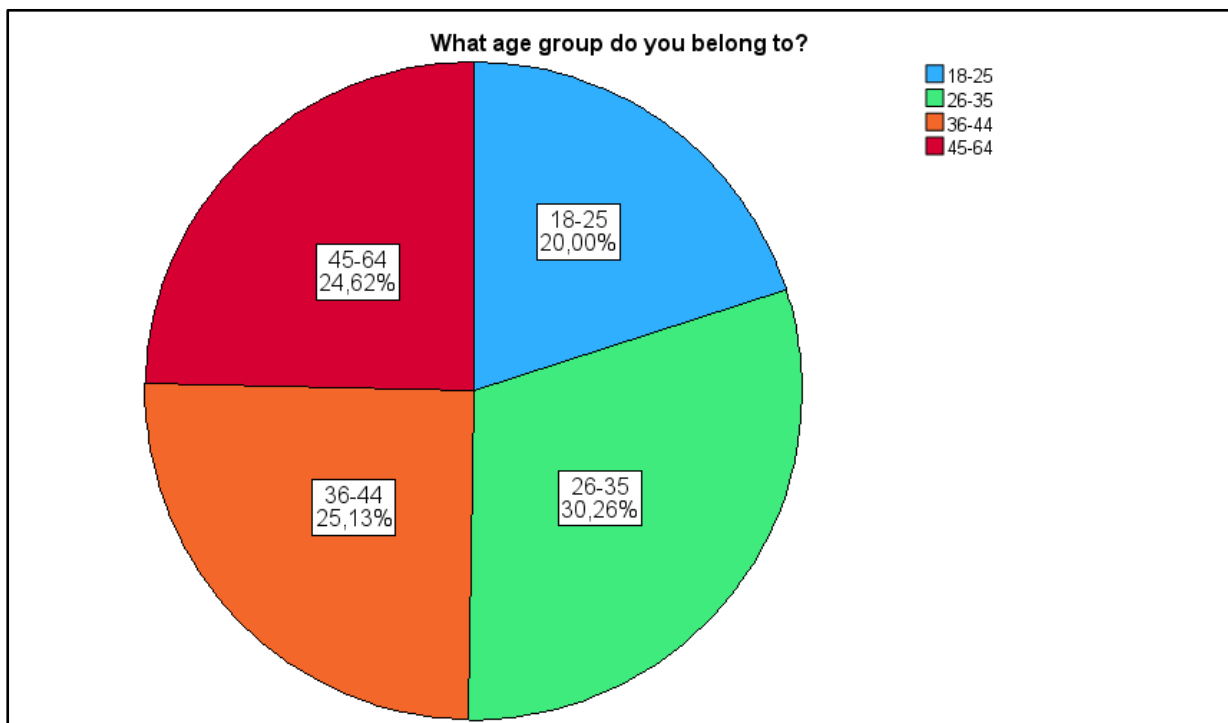


Figure 0-1: Age group distribution of the study.
Source: Author's conceptualisation

4.2.2 Time Spent

The time spent in the restaurant was also used as a screening criterion, requiring participants to have spent at least 30 minutes to qualify. This ensured that participants had sufficient time to form an opinion after interacting with the 3D holographic fan. The results indicate that 7.95% of participants spent 30 to 45 minutes in the restaurant; 19.74% spent 46 to 60 minutes, 30% spent 61 to 90 minutes, and 42.31% spent more than 90 minutes in the restaurant (Figure 4-2). These findings suggest that the participants were sufficiently exposed to 3D holographic fan advertising.

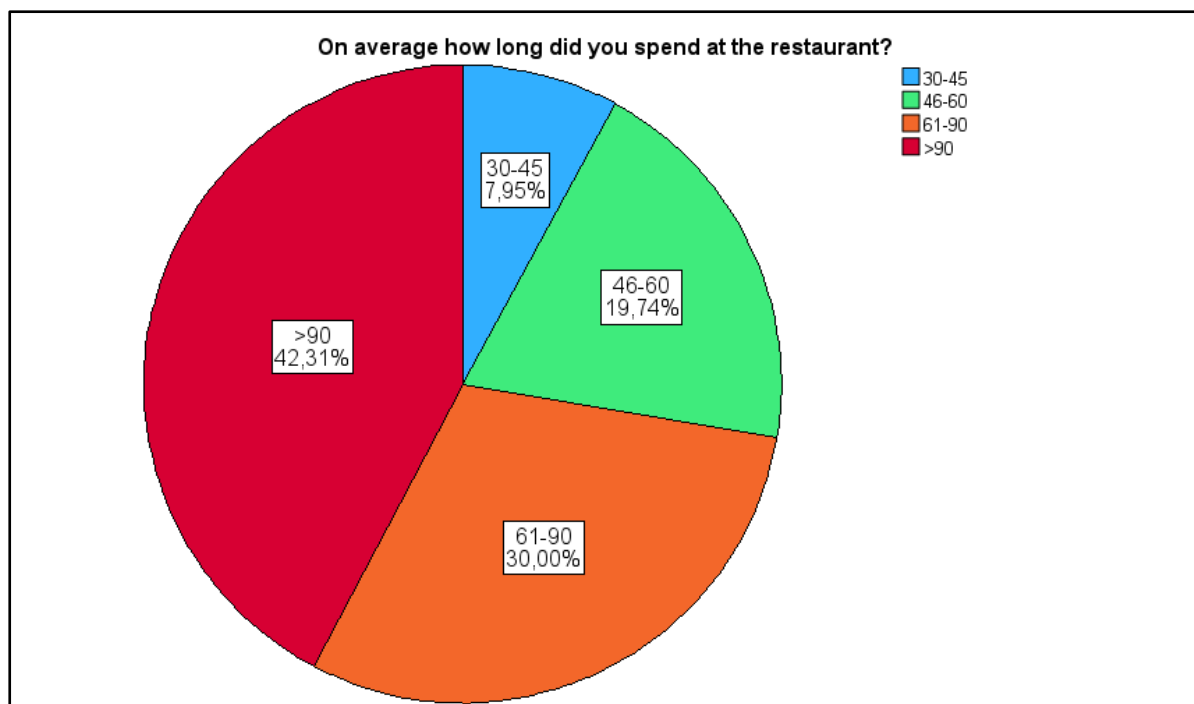


Figure 0-2: Average time spent at the restaurant before participating in the study.
Source: Author's conceptualisation

4.3 Consumer Attitudes Towards 3D Holographic Fan Advertising

This section presents the outcome of the participants' responses to items and statements about their attitudes towards 3D holographic fan advertising, as measured by the four attitudinal forms (informativeness, entertainment, irritation, and credibility).

4.3.1 Informativeness (INF)

For item INF1, the results indicate that participants perceived the 3D holographic fan as a good source for providing timely information on products and services (Figure 4-3). This is demonstrated by 41.03% of participants agreeing and 45.13% strongly

agreeing with the statement, while 11.03% remained neutral, whereas 1.54% of participants disagreed, and 1.28% strongly disagreed with the statement.

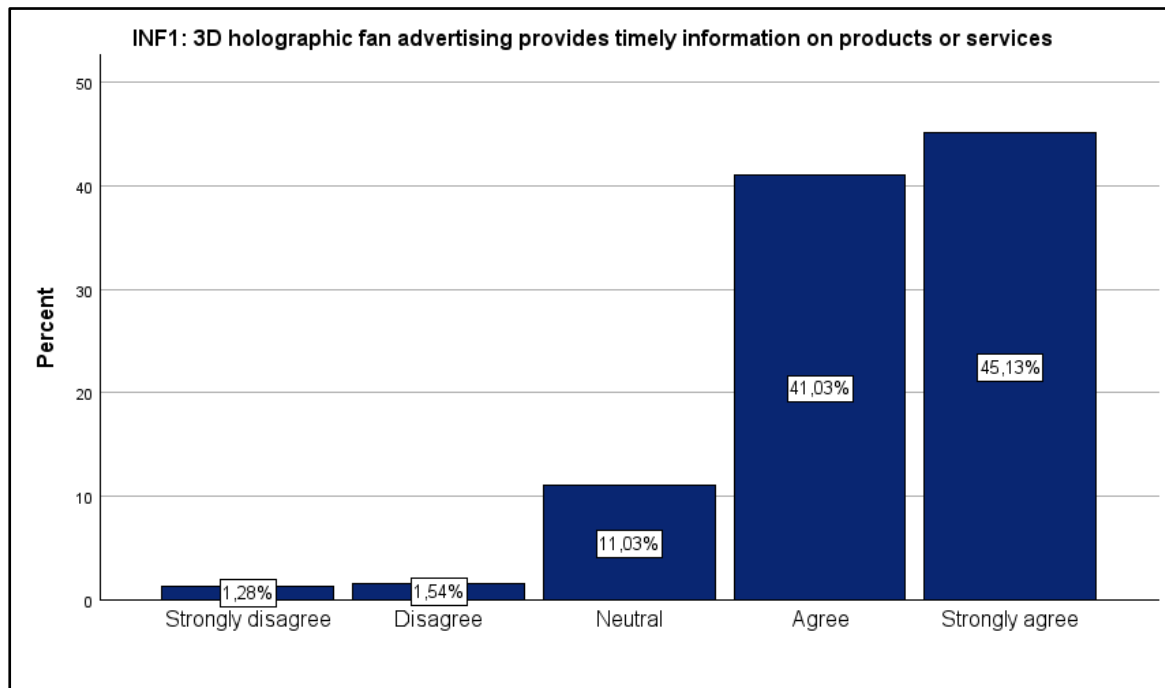


Figure 0-3: Findings of INF1, 3D holographic fan advertising provides timely information on products and services.

Source: Author's conceptualisation

The findings show that participants perceived 3D holographic fan advertising to provide relevant information on products and services (INF2) (Figure 4-4). This is reflected by 42.05% of participants agreeing and 43.59% of participants strongly agreeing with the statement. In contrast, only 1.79% disagreed, 1.28% strongly disagreed and only 11.28% remained neutral.

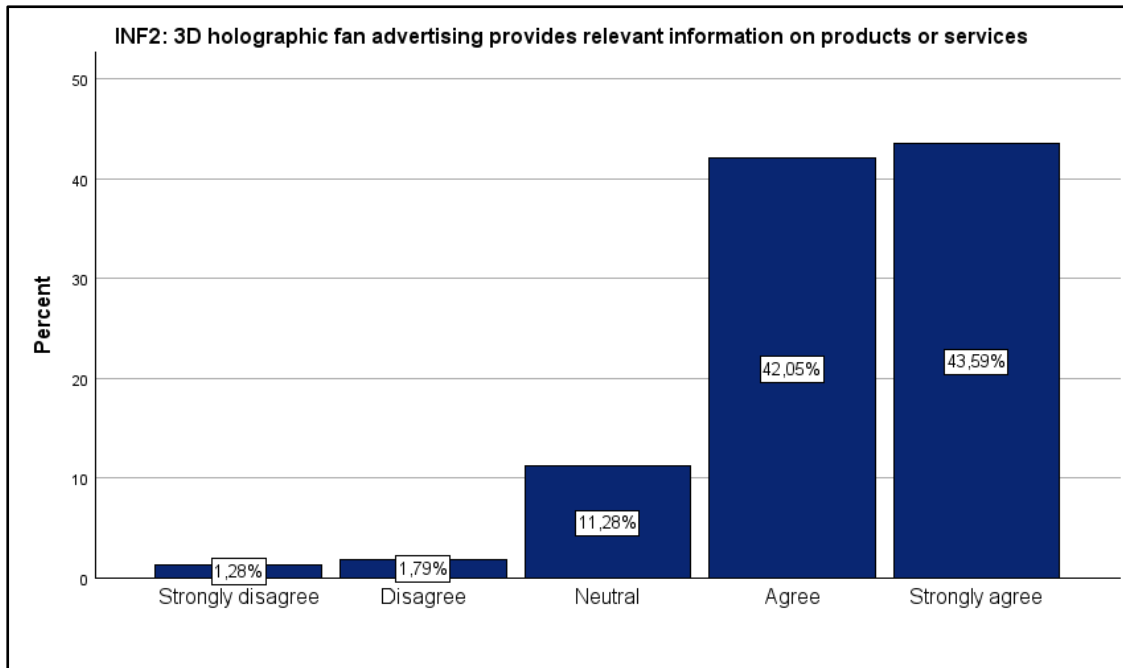


Figure 0-4: Findings of INF2, 3D holographic fan advertising provides relevant information on products and services.

Source: Author's conceptualisation

The results further indicate that participants viewed the 3D holographic fan as a good source of information (INF3) (Figure 4-5). This is evident, as 37.18% of participants agreed, and 50% strongly agreed. Meanwhile, 2.31% disagreed, and 1.79% strongly disagreed with the statement. Additionally, 8.72% of participants chose to remain neutral.

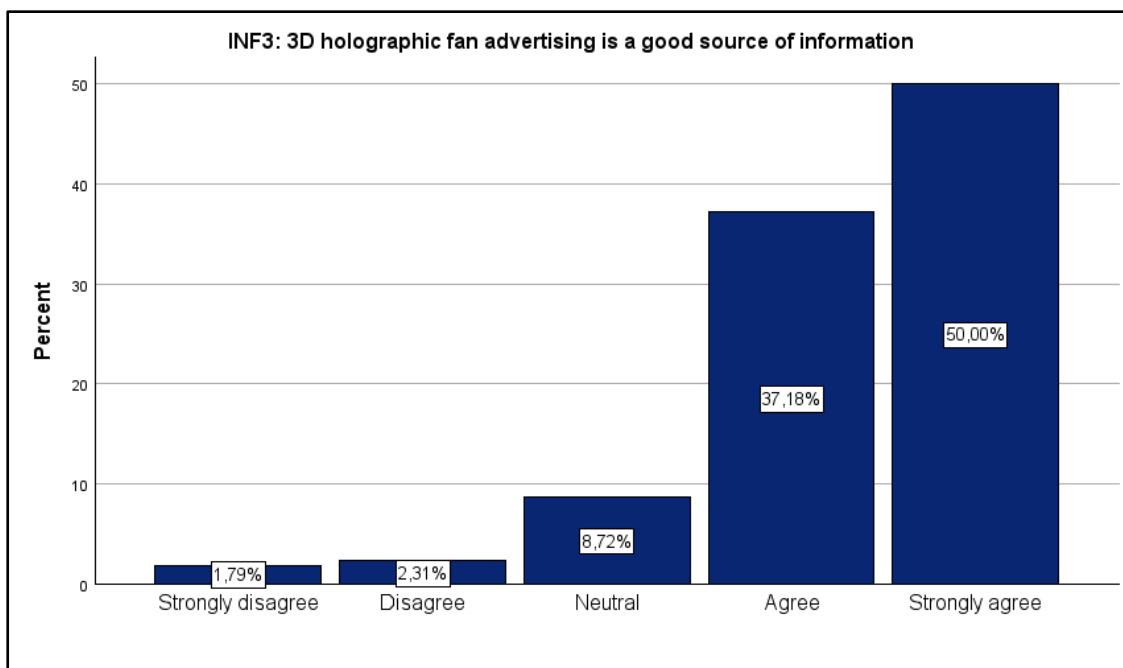


Figure 0-5: Findings of INF3, 3D Holographic fan advertising is a good source of information.

Source: Author's conceptualisation

Informativeness is a well-studied construct in advertising, and it is expected that advertisements that provide relevant timely information and are from a good source of information stimulate positive consumer attitudes. This work found that participants generally find 3D holographic fans to be a good source of information.

4.3.2 Entertainment (ENT)

For item ENT1, participants perceived 3D holographic fan advertising as interesting (Figure 4-6). The results show that 60.77% of participants strongly agreed, while 27.95% agreed with the statement, whereas 1.28% of participants strongly disagreed, 1.03% disagreed, and 8.97% of participants chose to remain neutral.

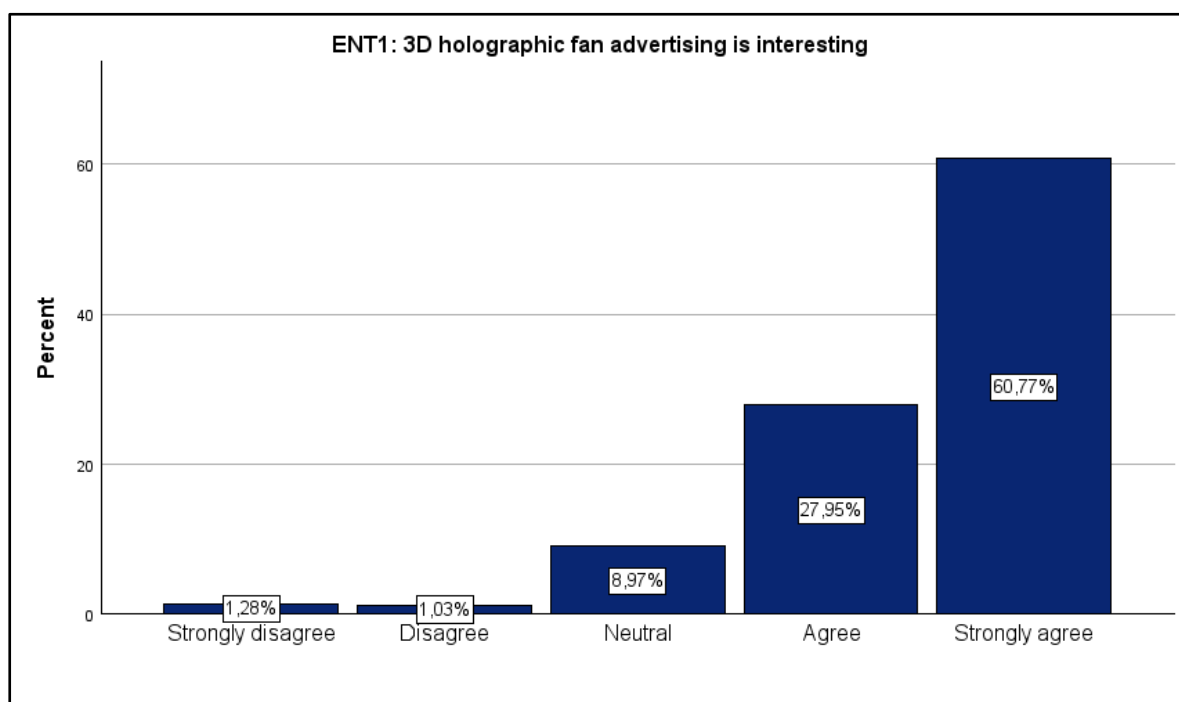


Figure 0-6: Findings for ENT1, 3D holographic fan advertising is interesting.
Source: Author's conceptualisation

The results indicate that participants found 3D holographic fans enjoyable (Figure 4-7). Specifically, 57.69% strongly agreed, and 27.18% agreed with item ENT2. Additionally, 12.05% of participants remained neutral, while 1.54% disagreed and 1.54% strongly disagreed that the 3D holographic fan is enjoyable.

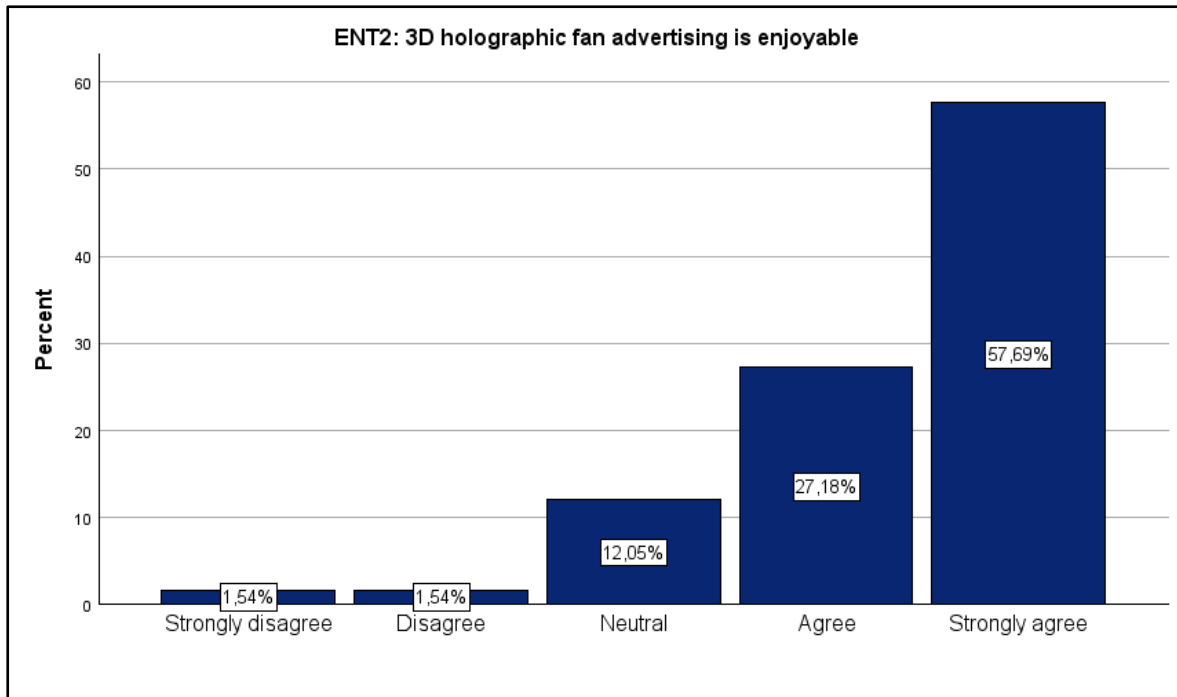


Figure 0-7: Findings for ENT2, 3D holographic fan advertising is enjoyable.
Source: Author's conceptualisation

Regarding ENT3, 3D holographic fan advertising is entertaining (Figure 4-8), 56.15% of participants strongly agreed and 27.44% agreed with item ENT3, whereas only 1.28% strongly disagreed and 2.31% disagreed. 12.82% of participants remained neutral.

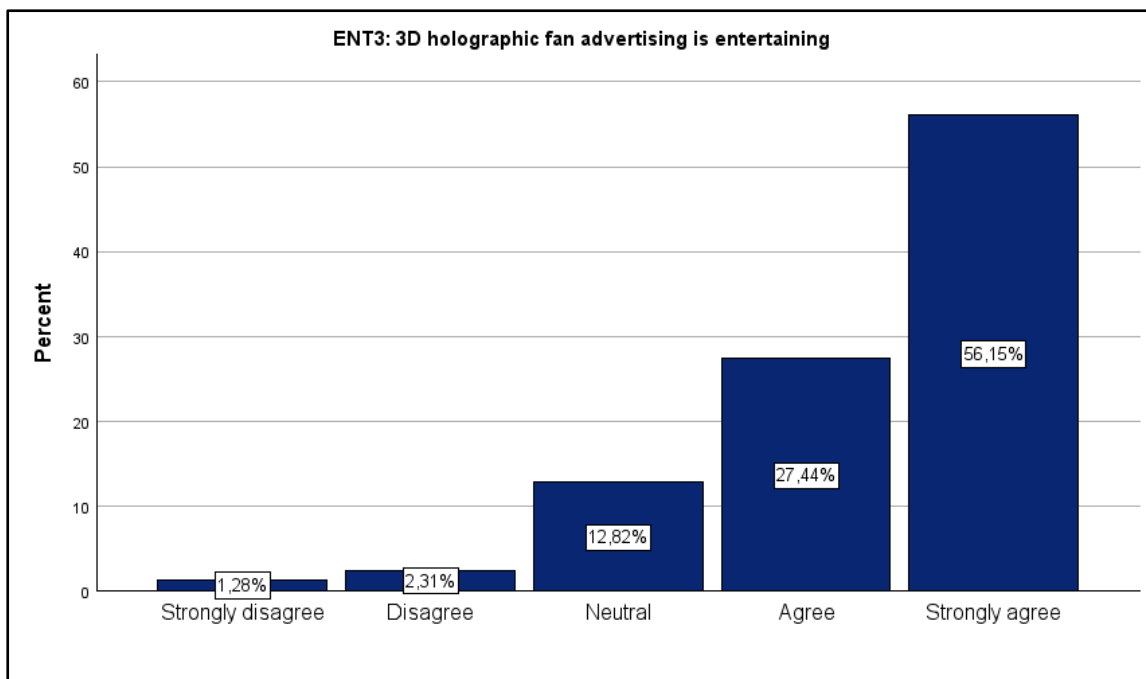


Figure 0-8: Findings for ENT3, 3D holographic fan advertising is entertaining.
Source: Author's conceptualisation

Participants found 3D holographic fans pleasing (Figure 4-9). This is evident from the 51.28% of participants who strongly agreed and 33.08% of participants agreeing with item ENT4, whereas only 1.54% strongly disagreed and 1.28% disagreed with the item. Only 12.82% of participants chose to remain neutral.

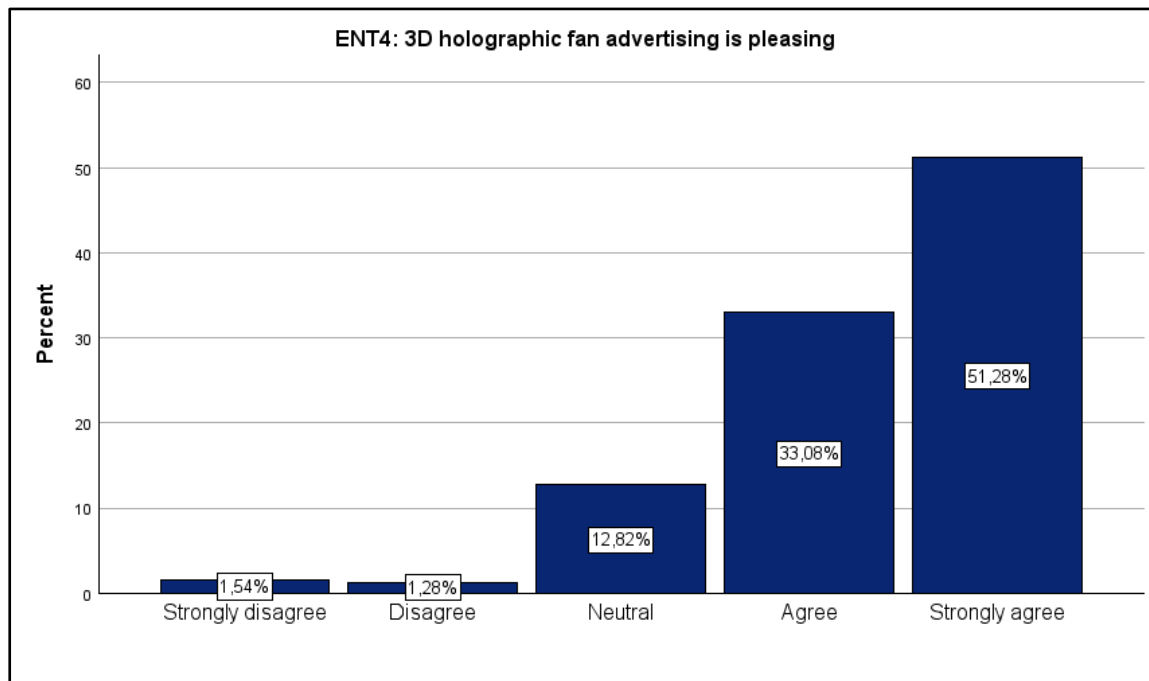


Figure 0-9: Findings for ENT4, 3D holographic fan advertising is pleasing.
Source: Author's conceptualisation

The entertainment variable is well-studied in advertising. Consumers perceived 3D holographic fans to be very entertaining. The study posits that the nature of 3D holographic fans is unique and entertaining, and this will likely influence consumer attitudes.

4.3.3 Irritation (IR)

Participants were asked to respond to statements related to irritation. The findings show that 58.72% of participants strongly disagreed that the 3D holographic fan is irritating (Figure 4-10), whereas 26.41% disagreed with item IR1. In contrast, 2.05% of participants agreed that the 3D holographic fan is irritating, and 3.08% strongly agreed. Additionally, 9.74% of participants chose to remain neutral.

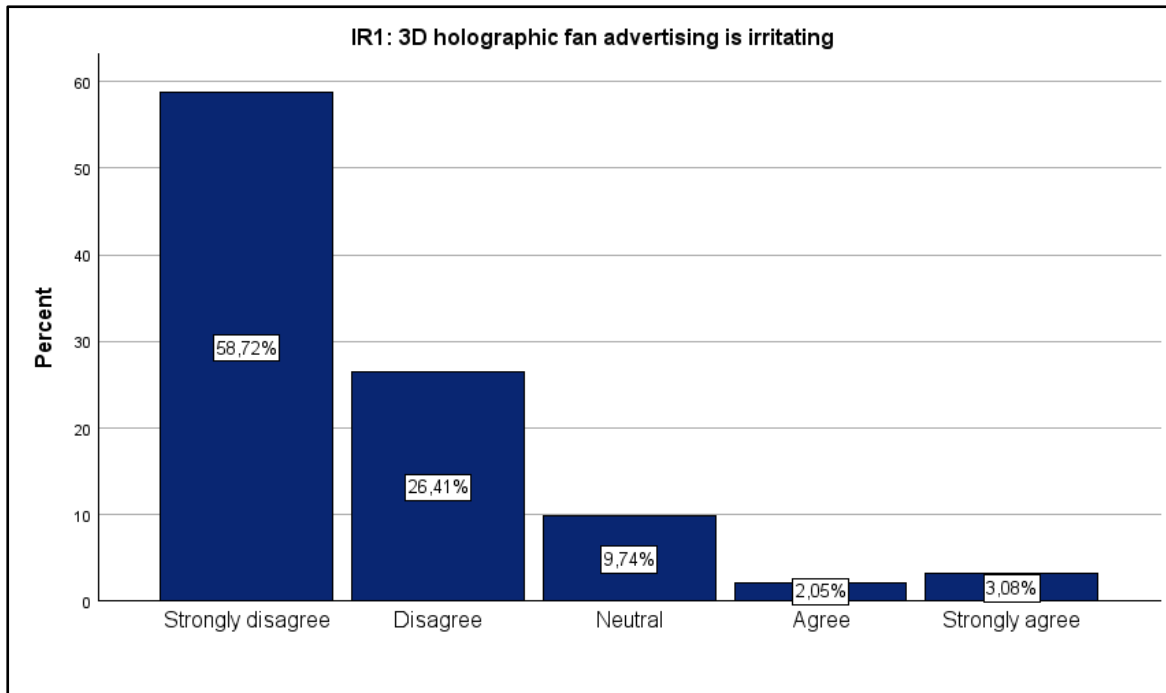


Figure 0-10: Findings for IR1, 3D holographic fan advertising is irritating.
Source: Author's conceptualisation

The findings show that participants did not find the 3D holographic fan annoying (Figure 4-11). This is evident, as 60.26% strongly disagreed, and 25.64% disagreed with item IR2. Additionally, 8.97% of participants chose to remain neutral, whereas only 2.56% agreed and 2.56% strongly agreed.

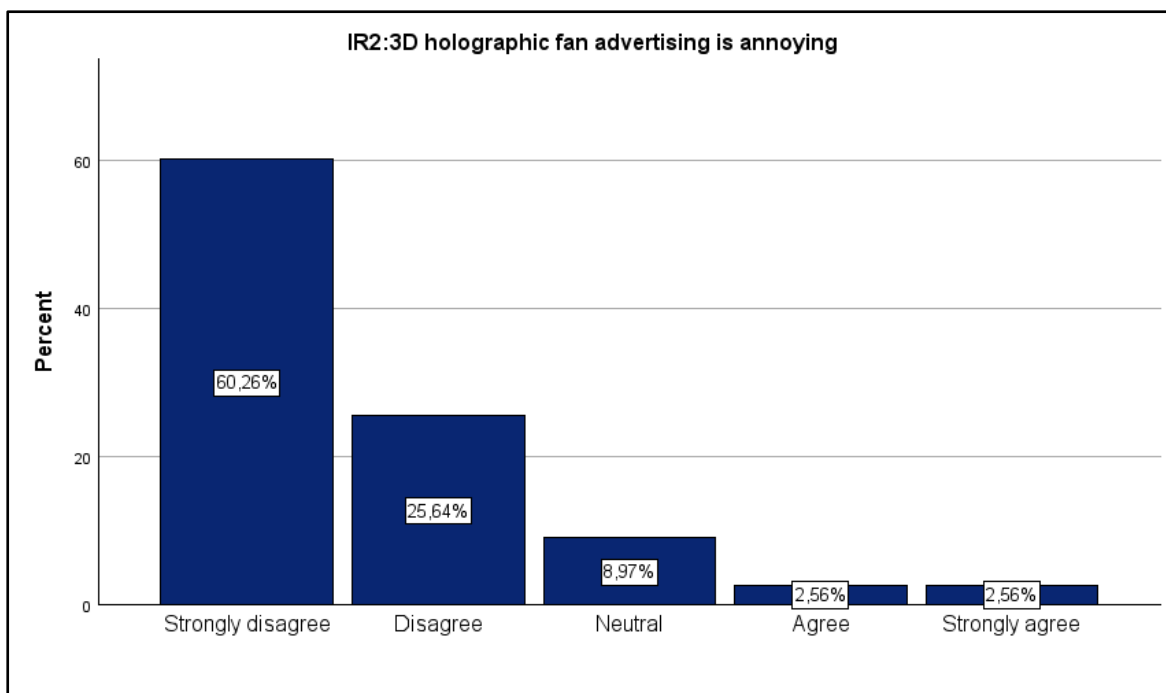


Figure 0-11: Findings for IR2, 3D holographic fan advertising is annoying.
Source: Author's conceptualisation

The results show that 58.46% of participants strongly disagreed and 26.15% disagreed with the statement that 3D holographic fan advertising is intrusive (Figure 4-12), whereas 3.33% agreed and 2.56% strongly agreed that it is intrusive. The results show that 9.49% of participants remained neutral.

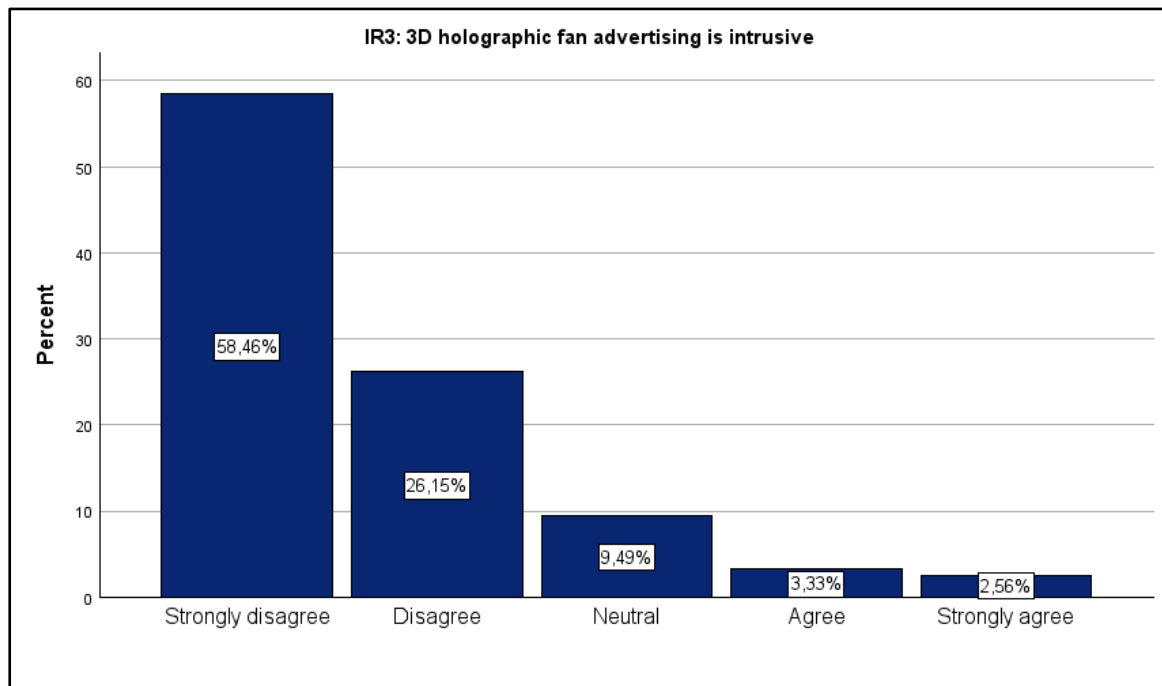


Figure 0-12: Findings for IR3, 3D holographic fan advertising is intrusive.

Source: Author's conceptualisation

The majority of the participants did not find 3D holographic advertising irritating, annoying, and/or intrusive.

4.3.4 Credibility (CR)

Participants were asked to respond to statements related to credibility. The results show that 39.74% of participants agreed and 32.56% of participants strongly agreed with the statement that 3D holographic fan advertising is convincing (Figure 4-13). In contrast, only 2.31% of participants strongly disagreed and 1.28% disagreed with item CR1. A significant number of participants, 24.10%, remained neutral.

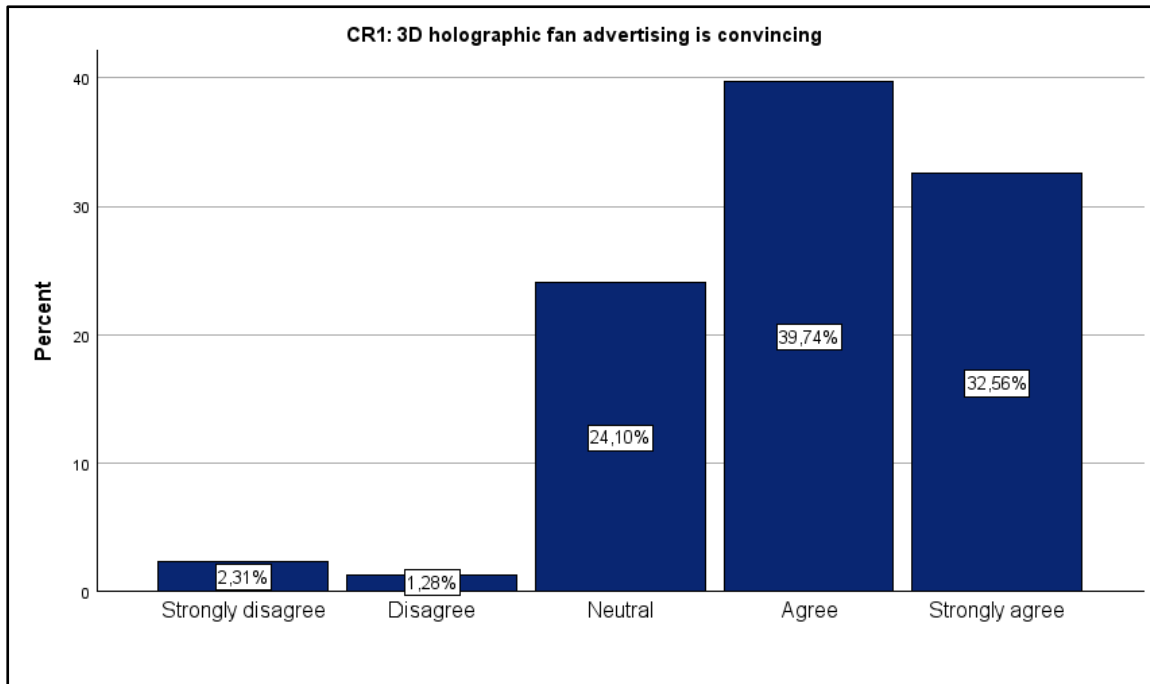


Figure 0-13: Findings for CR1, 3D holographic fan advertising is convincing.
Source: Author's conceptualisation

The results show that 35.90% of participants strongly agreed with item CR2, indicating that it is believable (Figure 4-14), while 41.54% agreed. In contrast, 1.79% of participants strongly disagreed, and 1.79% disagreed with item CR2. A significant proportion of participants, 18.97%, chose to remain neutral.

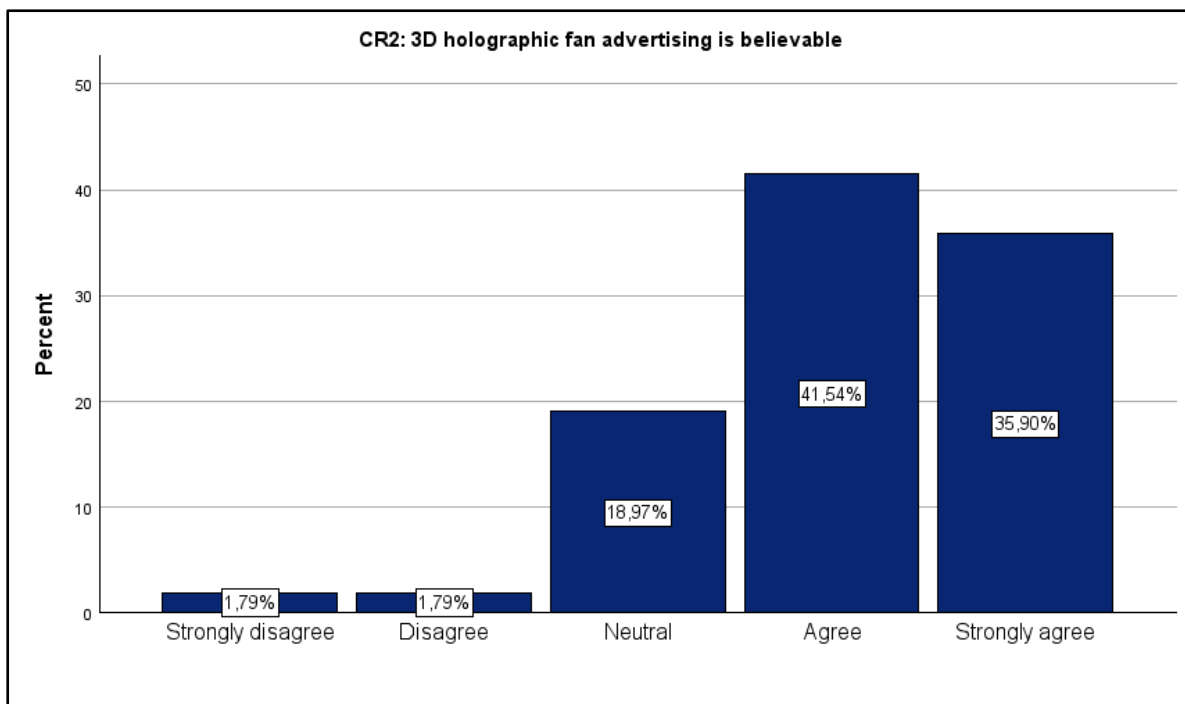


Figure 0-14: Findings for CR2, 3D holographic fan advertising is believable.
Source: Author's conceptualisation

The results indicate that 34.62% of participants strongly agreed with item CR3, and 40% agreed that 3D holographic fan advertising is credible (Figure 4-15), whereas 1.54% of participants strongly disagreed, and 1.54% disagreed with item CR3. A significant proportion of participants, 22.31%, chose to remain neutral.

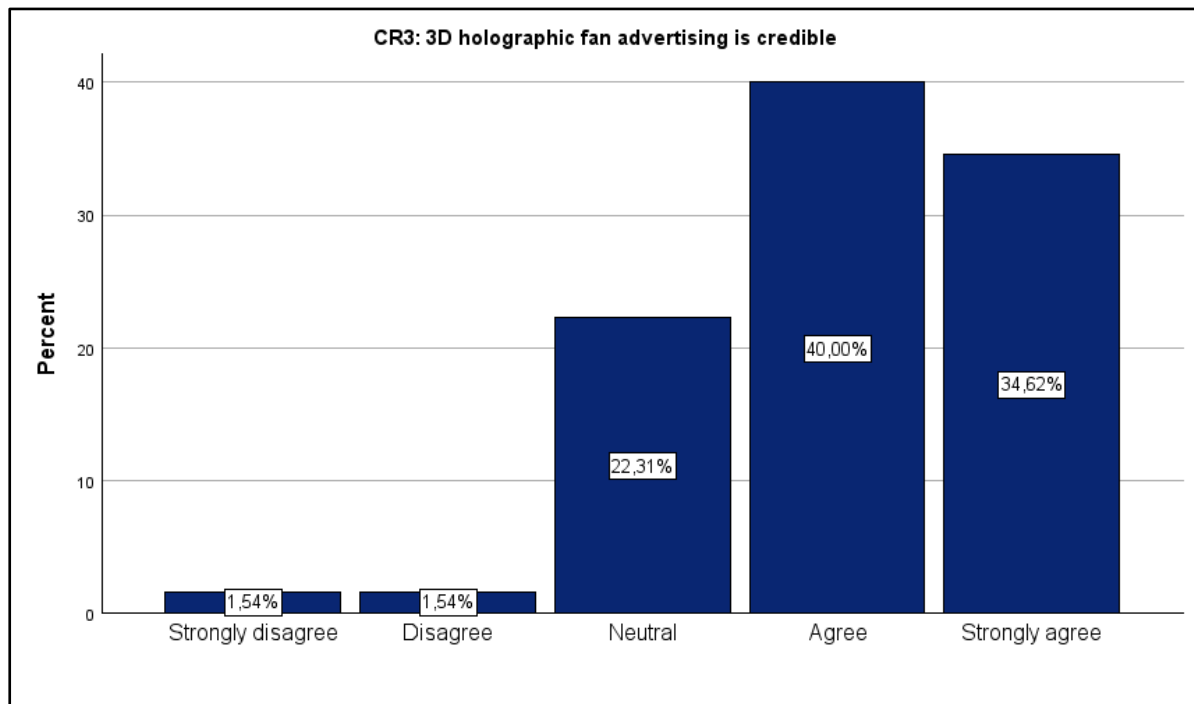


Figure 0-15: Findings for CR3, 3D holographic fan advertising is credible.
Source: Author's conceptualisation

The results show that 44.87% of participants strongly agreed with item CR4 and 32.56% agreed that 3D holographic fan advertising is a good reference for purchasing products (Figure 4-16), whereas only 1.79% of participants strongly disagreed and 2.31% disagreed with item CR4. A substantial proportion of participants, 18.46%, chose to remain neutral.

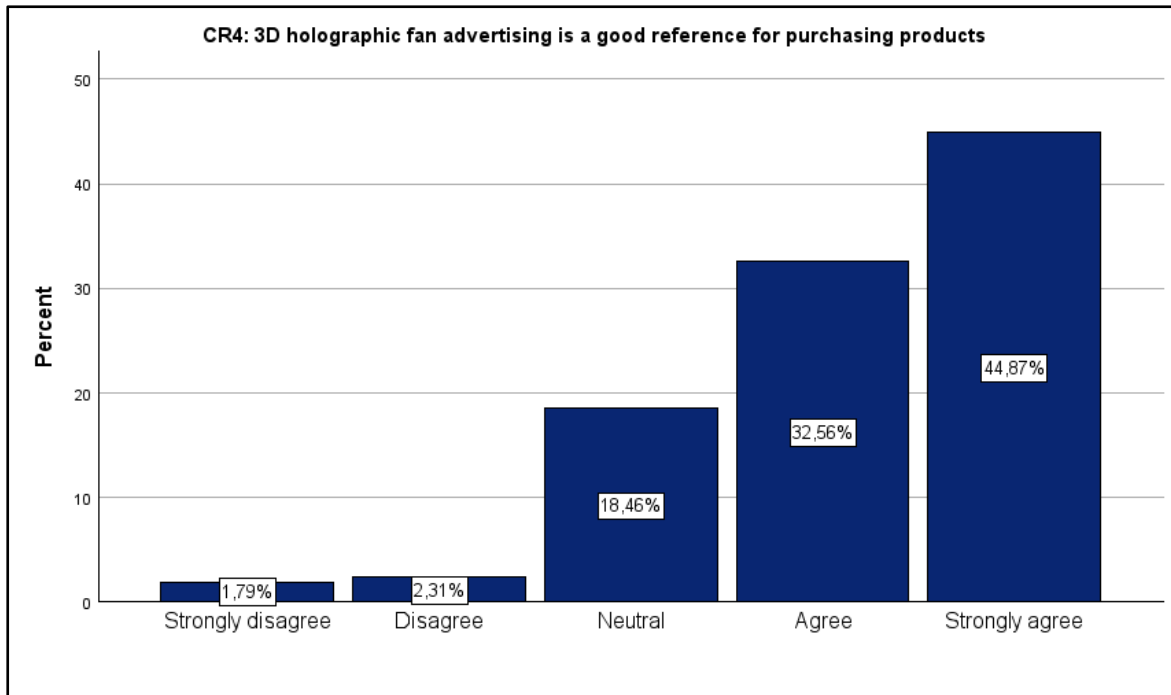


Figure 0-16: Findings for CR4, 3D holographic fan advertising is a good reference for purchasing products.

Source: Author's conceptualisation

The overall findings show that participants found 3D holographic fan advertising to be a credible source. The credibility of advertising is linked to positive consumer attitudes.

4.3.5 Attitudes (ATT)

Participants were asked to respond to statements related to their attitudes towards 3D holographic fan advertising. The results show that 55.90% of participants strongly agreed and 30.51% agreed that they like 3D holographic fan advertising (Figure 4-17), whereas 0.77% of participants strongly disagreed and 2.05% disagreed with item ATT1. 10.77% of participants chose to remain neutral.

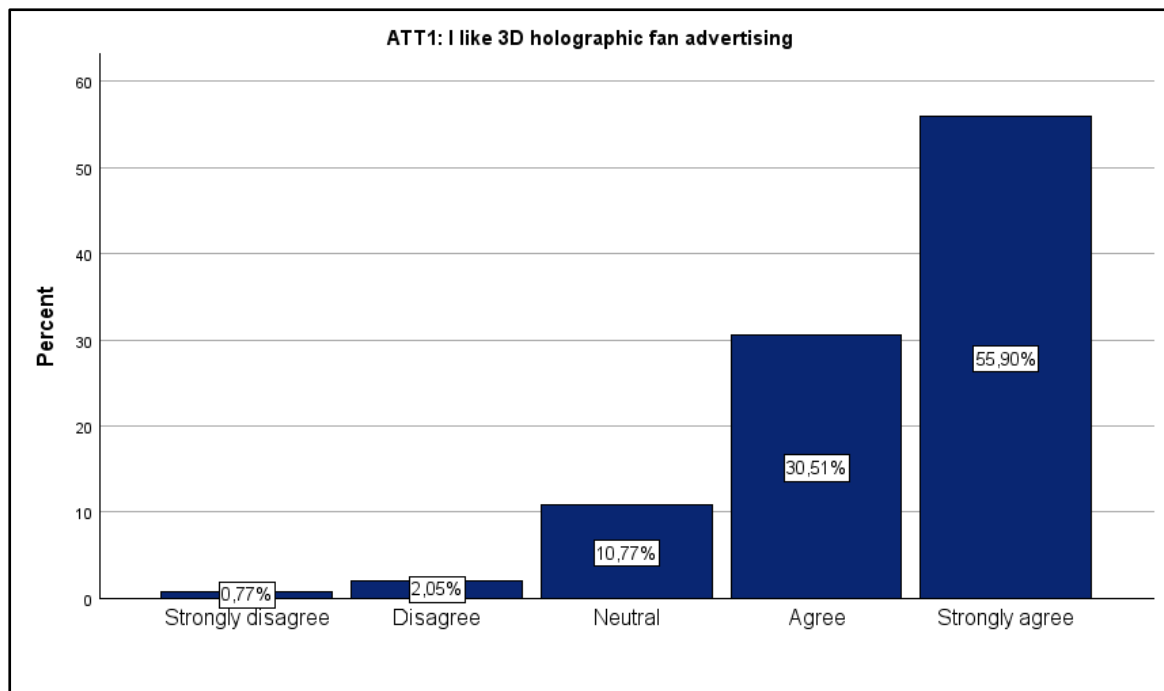


Figure 0-17: Findings for ATT1, I like 3D holographic fan advertising.
Source: Author's conceptualisation

The results show that 53.59% of participants strongly agreed with item ATT2, and 35.13% of participants agreed that 3D holographic fan advertising is good (Figure 4-18), whereas 1.03% of participants strongly disagreed and 1.54% disagreed with item ATT2. The results also show that 8.72% of participants chose to remain neutral.

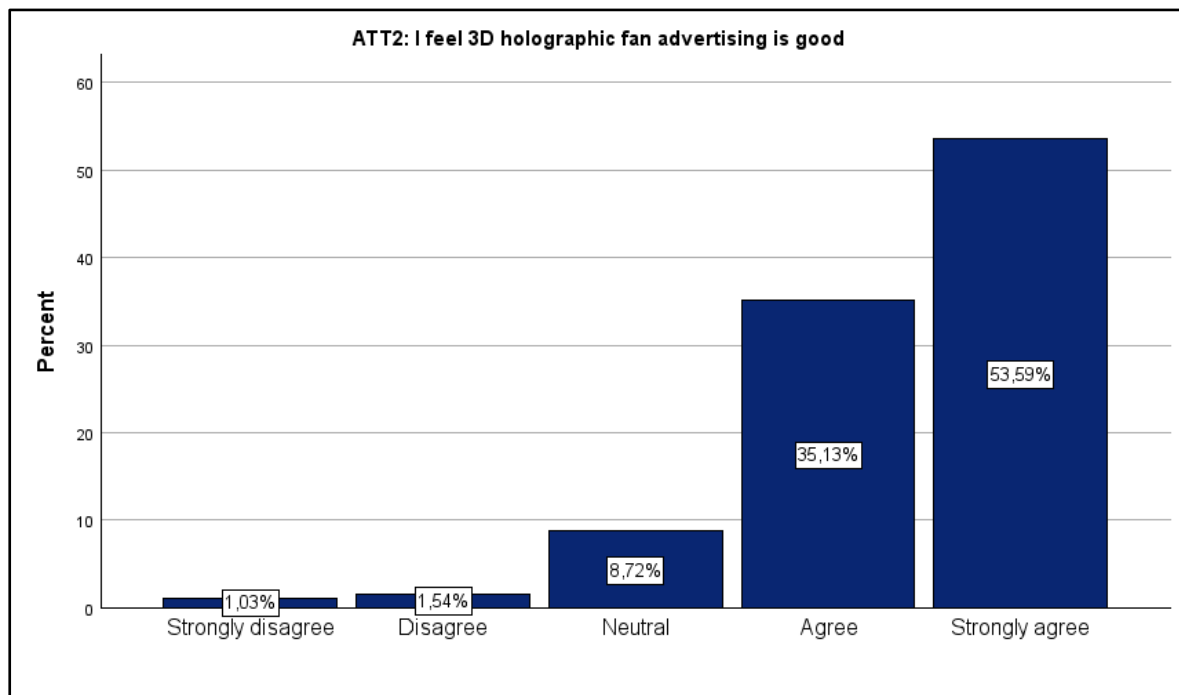


Figure 0-18: Findings for ATT2, I feel like 3D holographic fan is good.
Source: Author's conceptualisation

The results show that 68.46% of participants strongly agreed with item ATT3 and 24.87% agreed that 3D holographic fan advertising is creative (Figure 4-19), whereas only 0.51% strongly disagreed and 0.77% disagreed. A small percentage of 5.38% of participants chose to remain neutral.

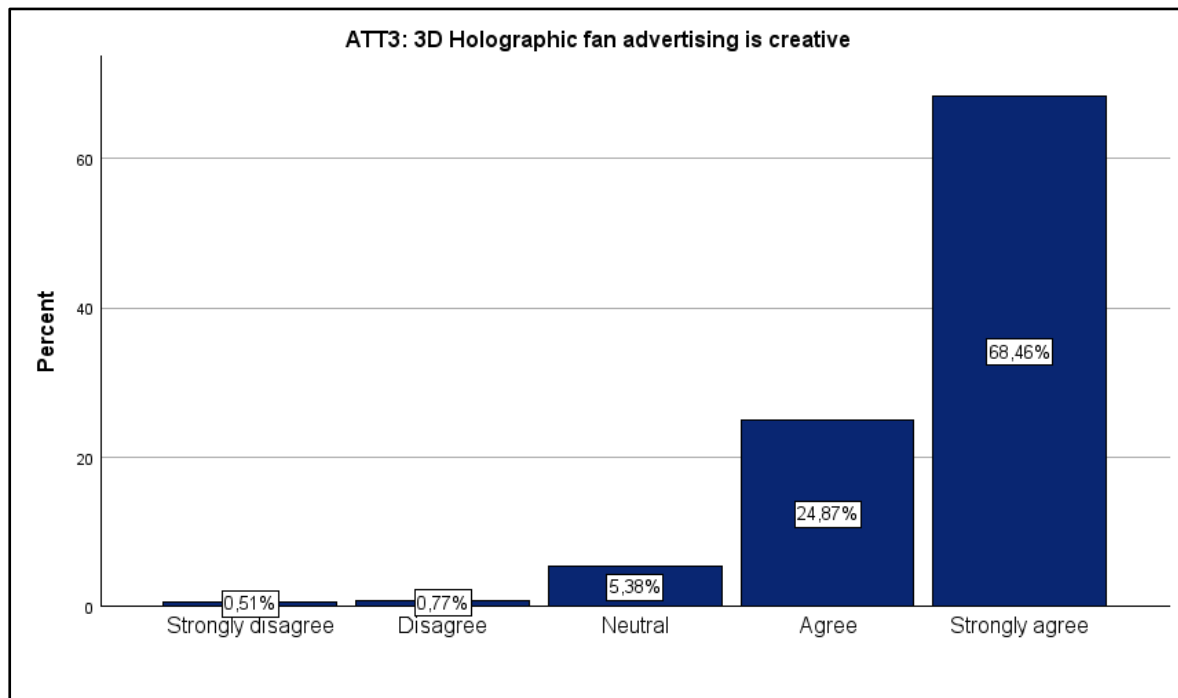


Figure 0-19: Findings for ATT3, 3D holographic fan advertising is creative.
Source: Author's conceptualisation

4.4 Purchase Intentions (PI)

Participants were asked to provide their opinions regarding purchase intentions. This section aimed to determine whether participants were likely to purchase products displayed on the 3D holographic fan and to assess whether consumer attitudes influenced their purchasing decisions.

The results show that 27.44% of participants strongly agreed and 36.38% agreed that they would buy products displayed on the 3D holographic fan (Figure 4-20), whereas 2.05% strongly disagreed and 2.56% disagreed with item PI1. A substantial 32.56% of participants remained neutral.

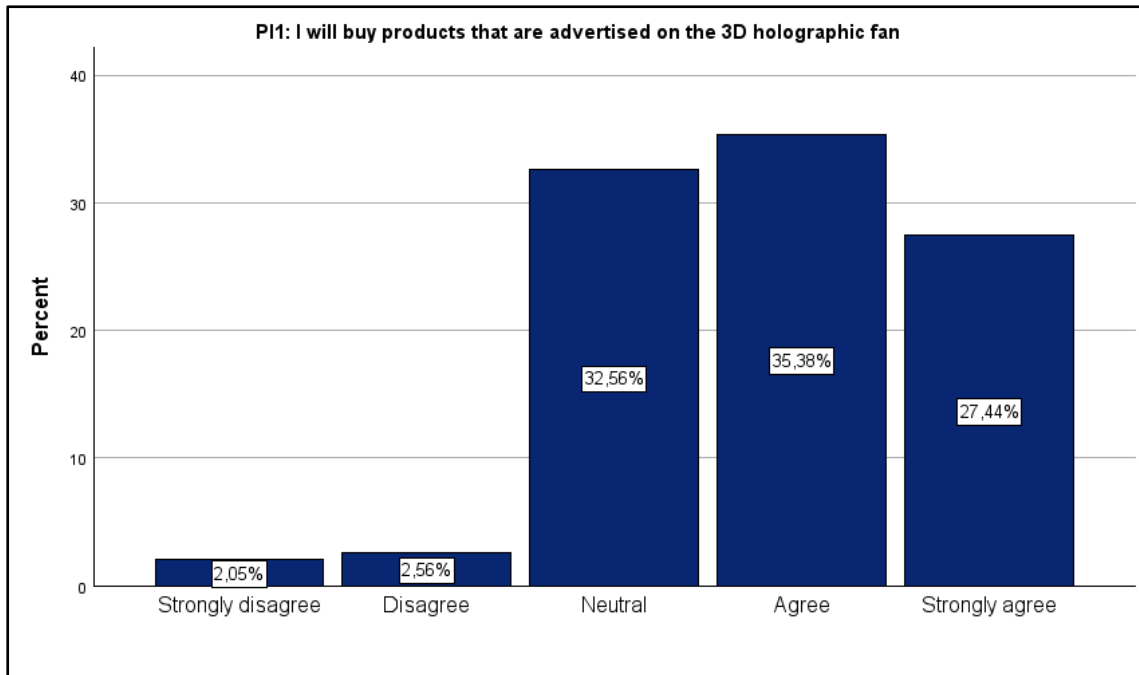


Figure 0-20: Findings for PI1, I will buy products that are advertised on the 3D holographic fan.

Source: Author's conceptualisation

The results show that only 20.26% of participants strongly agreed, and 29.23% agreed with item PI2, stating that they intend to buy products that are promoted by the holographic fan (Figure 4-21), whereas 1.79% strongly disagreed and 6.15% disagreed with item PI2. The majority of the participants at 42.56% chose to remain neutral.

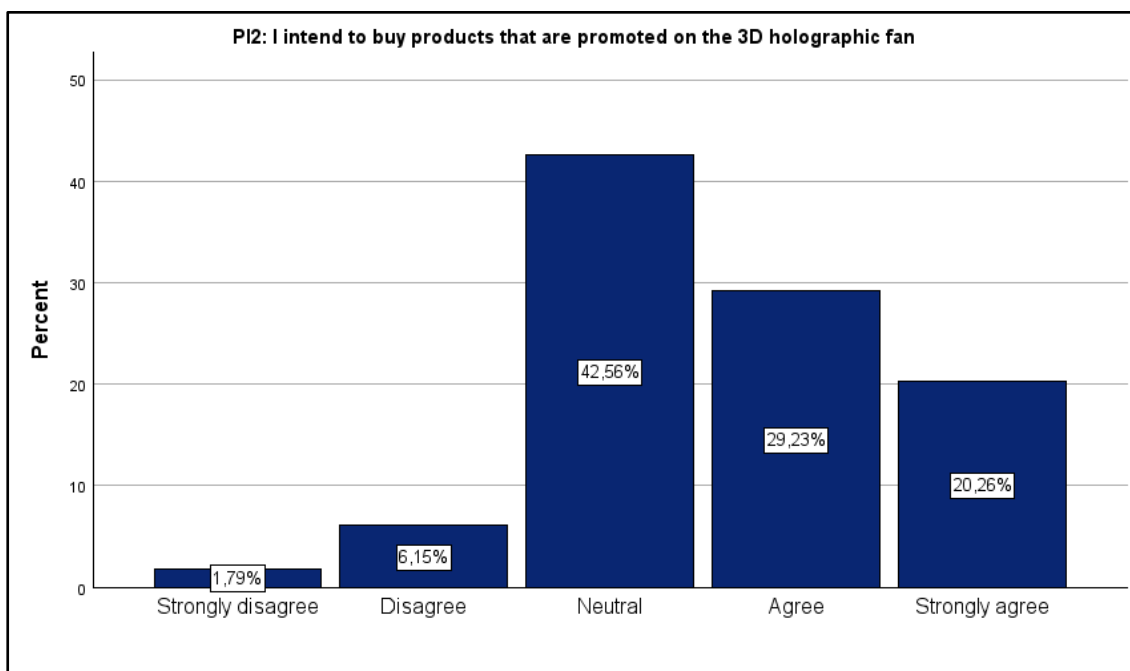


Figure 0-21: Findings for PI2, I intend to buy products that are promoted on the 3D holographic fan.

Source: Author's conceptualisation

The results show that 22.56% of participants strongly agreed and 38.97% agreed with item PI3 that they are likely to buy products promoted from the 3D holographic fan (Figure 4-22), whereas 1.79% strongly disagreed and 4.36% disagreed with item PI3. A substantial number of participants, at 32.31%, were neutral.

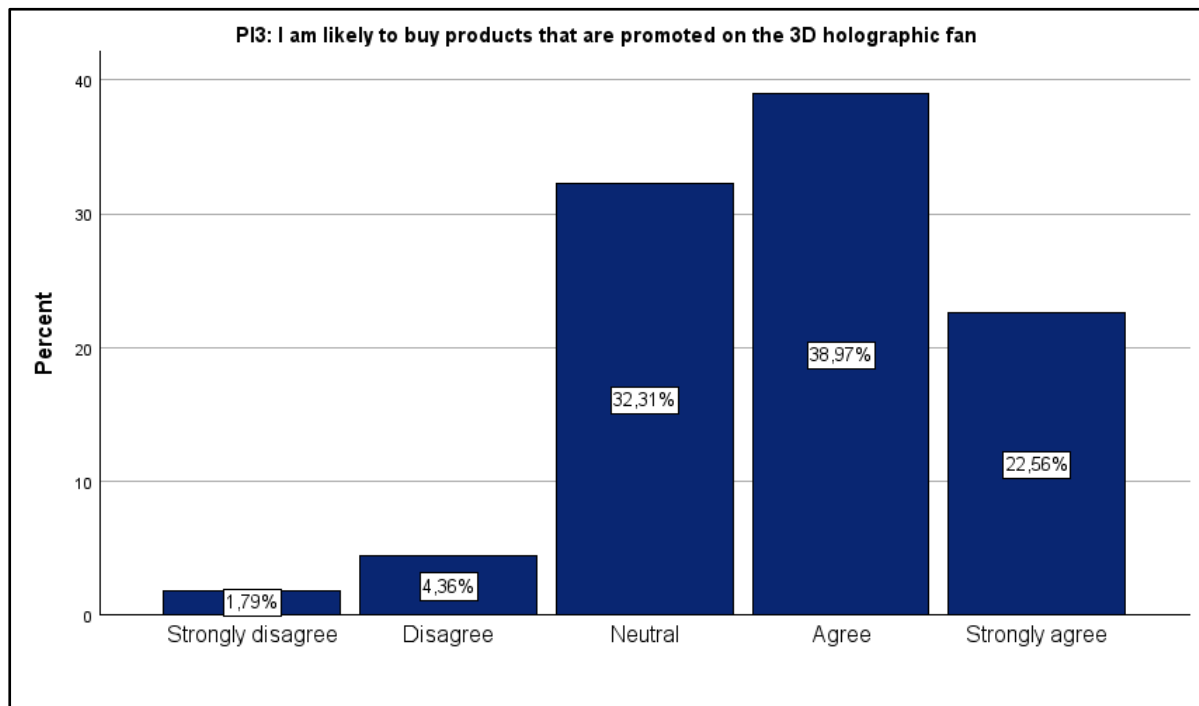


Figure 0-22: Findings for PI3, I am likely to buy products that are promoted on the 3D holographic fan.

Source: Author's conceptualisation

The results show that 32.82% of participants strongly agreed and 32.31% agreed with Item PI4 that they would strongly recommend others to purchase products advertised on the 3D holographic fan (Figure 4-23), whereas 1.28% strongly disagreed and 2.28% disagreed with item PI4. A substantial number of participants, 30.77%, were neutral.

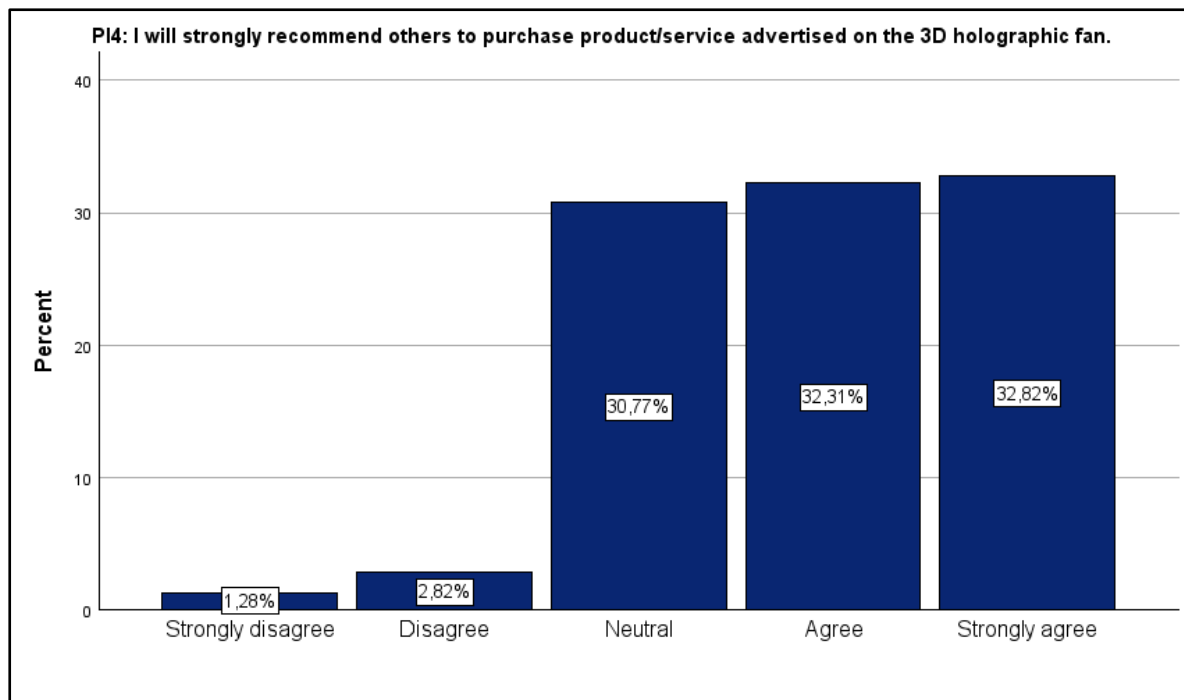


Figure 0-23: Findings for PI4, I will strongly recommend others to purchase products/services advertised on the 3D holographic fan.
Source: Author's conceptualisation

The results from purchase intention are somewhat ambiguous, with a significant number of participants choosing to remain neutral. This outcome is related to whether the products advertised met their current or future needs. Participants indicated that they are, in most cases, influenced by the advertising to make a purchase or recommend the product advertised.

4.5 Measurement Model

4.5.1 Instrument Reliability

To test the reliability of the instrument, Cronbach's alpha (CA) was tested for all variables using IBM® SPSS® Amos™ 29.0, and the results show that CA is greater than 0.8, which means that reliability is achieved. The second criterion to test indicator reliability, which was to be confirmed by the factor loadings using the CFA. The results show that standardised factor loadings are greater than 0.7, which is higher than the recommended 0.5 for statistical significance (Hair et al., 2010), which means that indicator reliability is achieved. Composite reliability (CRe) was also tested, and all constructs resulted in composite reliability of greater than 0.8, meaning that the instrument reliability was achieved (Table 4-1).

4.5.2 Convergent Validity

The convergent validity was tested by calculating the average variance extracted (AVE). The results show that AVE is greater than 0.7, which explains more than half of the variance of its indicators on average (Martins et al., 2019).

4.5.3 Discriminant Validity

Discriminant validity was tested by using the Fornell-Larcker criterion (Fornell & Larcker, 1981) which states that the root square of AVE must be greater than any correlation of the variables. The results show that the square root of AVE is greater than the correlation of the variables (Table 4-2). Therefore, there are no validity concerns for this measurement model, and the criteria for attitude measurements are met.

Table 0-1: Instrument reliability and validity.

Construct	Loadings	CA	CRe	AVE
Informativeness (INF)		0.889	0.890	0.730
INF1	0.853			
INF2	0.875			
INF3	0.834			
Entertainment (ENT)		0.954	0.954	0.839
ENT1	0.872			
ENT2	0.947			
ENT3	0.932			
ENT4	0.911			
Irritation (IR)		0.971	0.971	0.919
IR1	0.956			
IR2	0.988			
IR3	0.931			
Credibility (CR)		0.925	0.928	0.919
CR1	0.871			
CR2	0.924			
CR3	0.893			
CR4	0.801			
Attitude (ATT)		0.917	0.920	0.794
ATT1	0.921			
ATT2	0.903			
ATT3	0.848			
Purchase Intention (PI)		0.906	0.907	0.709
PI1	0.849			
PI2	0.886			
PI3	0.836			
PI4	0.794			

Source: Author's conceptualisation

Table 0-2: Discriminant validity of the instrument.

	CRe	AVE	ATT	INF	ENT	IR	CR	PI
ATT	0.920	0.794	0.891					
INF	0.890	0.730	0.654	0.854				
ENT	0.954	0.839	0.788	0.686	0.916			
IR	0.971	0.919	-0.439	-0.375	-0.37	0.959		
CR	0.928	0.763	0.629	0.753	0.665	-0.254	0.873	
PI	0.907	0.709	0.569	0.625	0.516	-0.207	0.666	0.842

Bold diagonal values are the square root square of the AVE, and off-diagonal values are from the correlation matrix of variables.

Source: Author's conceptualisation

4.6 Structural Equation Model

The measurement model is satisfactory, as presented above, allowing for structural equation modelling. In this study, two criteria are used to assess the structural model before hypothesis testing: (1) the coefficient of determination (R^2) of the endogenous variables (dependent variables) and (2) the overall model fit. According to Hair et al. (2017), a moderate level of precision is indicated by an R^2 value greater than 0.25. A bootstrap of 5,000 subsamples at a 95% confidence level was used to produce the model outcomes. The squared multiple correlation shows that consumer attitude has an R^2 value of 0.61, which is substantial, while purchase intention has an R^2 value of 0.28, which is moderate (Figure 4-24).

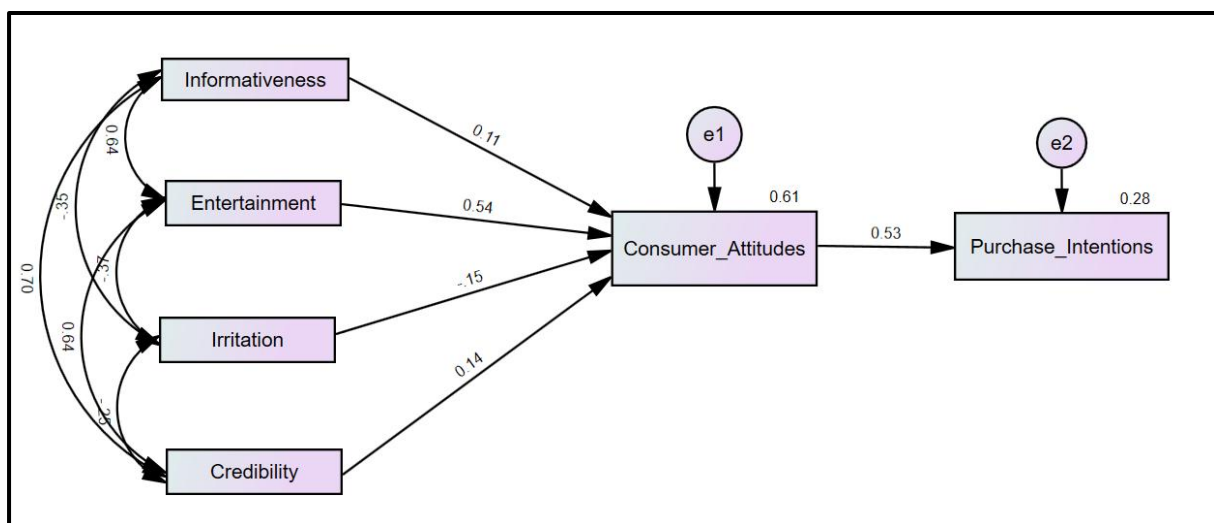


Figure 0-24: Model to be assessed as presented in Chapter 2 and outcome of model assessment.

Source: Author's conceptualisation

Model fit was analysed to assess if the observed data fits the proposed model. The following fit indices are assessed; X2 (Chi-square) probability (degree of freedom) X2/Df (Chi-square ratio), RMR (root mean residual), GFI (goodness of fit index), CFI (comparative fit index), NFI (normed fit index), TLI (Tucker-Lewis Index), IFI (incremental fit index), RMSEA (root mean square error of approximation). The results are as follows (Table 4-3).

Table 0-3: Model fit for the proposed conceptual model.

Model fit	Standard	Results	Outcome
X2	-	104.495	
Df	-	4	
Probability (p value)	>0.005	0.000	Significant
X2/Df (Chi-square ratio)	<3	26.124	Very poor
RMR	≤ 0.08	0.058	Good
GFI	>0.9	0.927	Acceptable
CFI	>0.9	0.914	Acceptable
NFI	>0.9	0.912	Acceptable
TLI	>0.9	0.679	Very poor
IFI	>0.9	0.915	Acceptable
RMSEA	<0.08	0.254	Very poor

Source: Author's conceptualisation

The model does not fit perfectly. The *p*-value is 0.000, indicating that the model is statistically significant and rejects the null hypothesis that the data fits well. This is further supported by the chi-square ratio value being extremely high at 26.124, whereas the acceptable standard is less than 3. Additionally, the TLI indicates a poor fit, and the RMSEA value suggests a poor fit. However, other indices, such as GFI, CFI, NFI, and IFI, indicate a good fit. The model fit results are somewhat ambiguous, suggesting that the current model requires modifications.

The modification indices from the results show a strong positive link between informativeness and credibility to purchase intentions. This modification warrants adding additional paths to the model. These additional paths are treated as exploratory findings from the original model. The modified path model is as follows (Figure 4-25).

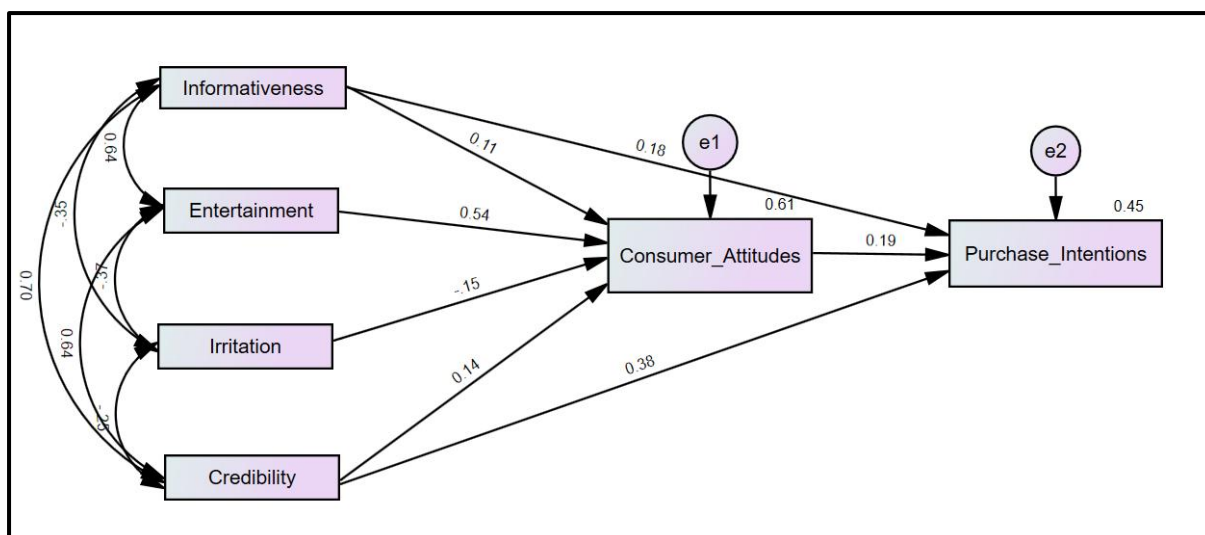


Figure 0-25: Modified path model.
Source: Author's conceptualisation

A similar criterion is applied to the modified model. The R^2 value for purchase intentions improved from 0.28 (moderate) to 0.45 (good), while consumer attitude remains good at 0.61. The coefficient of determination for this modified model is also good. The model fit was tested, and the results showed a perfect fit for all indices (Table 4-4).

Table 0-4: Model fit for modified model.

Model fit	Standard	Results	Outcome
X2	-	1.636	
Df	-	2	
Probability	>0.001	0.441	Not significant
X2/Df (Chi-square ratio)	<3	0.818	Good
RMR	≤ 0.08	0.007	Good
GFI	>0.9	0.999	Good
CFI	>0.9	1	Good
NFI	>0.9	0.999	Good
TLI	>0.9	1	Good
IFI	>0.9	1	Good
RMSEA	<0.08	0.000	Good

Source: Author's conceptualisation

With the modified path model, the two set criteria are met, and the hypothesis testing can be performed with confidence.

4.7 Hypotheses Results

The results show that informativeness ($\beta = 0.099$, $p = 0.03$) has a positive correlation with consumer attitudes, and it is statistically significant, meaning that H1 is accepted. Entertainment ($\beta = 0.474$, $p = ***$) also has a positive correlation with consumer attitudes, and it is statistically significant, meaning that H2 is accepted. Irritation ($\beta = -0.177$, $p = ***$) has a negative correlation with consumer attitudes, and this correlation is statistically significant, meaning that H3 is accepted. Credibility ($\beta = 0.119$, $p = 0.004$) has a positive correlation with consumer attitudes, and it is statistically significant, meaning that H4 is accepted. Finally, consumer attitudes ($\beta = 0.224$, $p = ***$) has a positive correlation with purchase intention, and it is statistically significant, meaning that H5 is accepted.

The exploratory findings from the modified model show that informativeness ($\beta = .197$, $p = 0.001$) has a positive correlation to purchase intention and the results are statistically significant. Credibility ($\beta = .388$, $p = ***$) also has a positive correlation to purchase intentions and the results are statistically significant.

Table 0-5: SEM outcome for the proposed hypotheses and exploratory findings.

Hypothesis tested	Path	Estimate	S.E.	C.R.	P	Outcome	Results
H1	Informativeness → Attitude	0.099	0.045	2.171	0.03	Positive and significant	Accepted
H2	Entertainment → Attitude	0.474	0.04	11.861	***	Positive and significant	Accepted
H3	Irritation → Attitude	-0.117	0.027	-4.41	***	Negative and significant	Accepted
H4	Credibility → Attitude	0.119	0.042	2.862	0.004	Positive and significant	Accepted
H5	Attitude → Purchase Intentions	0.224	0.057	3.946	***	Positive and significant	Accepted
-	Informativeness → Purchase Intentions	0.197	0.061	3.257	0.001	Positive and significant	
-	Credibility → Purchase Intentions	0.388	0.056	6.919	***	Positive and significant	

Source: Author's conceptualisation

4.8 Summary of Results

The participants generally perceived the 3D holographic fan advertising as a good source of information that provides relevant details. They found the 3D holographic fan advertising entertaining and interesting and considered it less irritating and annoying. Additionally, they regarded it as a credible source, which results in a positive consumer attitudes towards 3D holographic fan advertising. Regarding purchase intentions, participants showed interest in purchasing products advertised, although some participants chose to remain neutral regarding purchase intention items.

The measurement model was tested using various criteria, and all criteria were met without issues. However, the structural equation model fit for the initially proposed model presented an ambiguous fit, leading to the modification of the study model to include additional paths: informativeness to purchase intention and credibility to purchase intention. These paths or findings are treated as exploratory for this study, and the main model was tested for hypothesis testing.

The results show that H1, H2, H3, H4, and H5 are accepted. Additionally, the results demonstrate that the relationship between informativeness and purchase intention is positive and statistically significant, as is the relationship between credibility and purchase intention.

CHAPTER 5: DISCUSSIONS

5.1 Introduction

This chapter aims to discuss the results presented in Chapter 4. It will examine the relationships between the attitudinal constructs and consumer attitudes, as well as the relationship between consumer attitudes and purchase intentions concerning 3D holographic fans. The final part of the discussion will explore the study's exploratory findings in relation to existing literature.

5.2 Relationship Between Informativeness and Consumer Attitudes

H1: The informativeness of the 3D holographic fan will have a positive relationship with consumer attitudes.

The relationship between informativeness and consumer attitudes has been extensively studied in advertising literature across various advertising platforms. As stated in the development of Hypothesis 1, information is perceived differently depending on the advertising medium. Assessing how consumers perceive information from 3D holographic fans was deemed important for this study. The results indicate that consumers considered 3D holographic fans a good source of information about products and services. Hypothesis 1 is supported by statistical evidence, showing only a 3% probability of the null hypothesis being true, confirming that 3D holographic fans are informative and positively influence consumer attitudes towards this advertising medium.

The findings of this study align with those of other researchers on the same phenomenon addressing different advertising platforms focusing on mobile and social media platforms (Abbasi et al., 2023; Disastra et al., 2018; Mahmut et al., 2022; Martins et al., 2019). These studies concluded that advertisements that provide relevant information about products positively influence consumer attitudes. Bezbaruah and Brahmabhatt (2023) found that in podcast advertising, informativeness is a significant determinant of consumer attitudes. This is attributed to podcasts using audio advertising and consumers relying on the information provided during audio streaming. In contrast to this study, informativeness only contributes minimal

significance to consumer attitudes because advertisements show the prominence of 3D models, which might overshadow text communication that consumers perceive as a key component of informative advertising.

5.3 Relationship Between Entertainment and Consumer Attitudes

H2: Entertainment displayed by the 3D holographic fan will have a positive relationship on consumer attitudes.

Entertainment has been widely studied in advertising literature, with many authors attributing it to having a positive influence on consumer attitudes. This study reports a similar outcome; consumers perceived 3D holographic fan advertising as entertaining. The results indicate that entertainment has a strong standardised coefficient of 0.54 and is statistically significant in influencing consumer attitudes. These findings align with those of other researchers, including Bezbaruah and Brahmbhatt (2023), Martins et al. (2019), and Saraiva and Lues (2023), who also found that entertainment positively influences consumer attitudes. The 3D holographic fan platform has the potential to leverage creative content similarly to other advertising platforms. For instance, audio advertising (Bezbaruah & Brahmbhatt, 2023) aligns advertisements with entertaining topics, while smartphones (Martins et al., 2019) serve as a source of entertainment and keep consumers engaged. In the case of 3D holographic fans, entertainment emerged as the most critical factor influencing consumer attitudes because of its enhanced visual capabilities.

Entertainment is a major contributor to the overall consumer attitudes in this study. This is likely because 3D holographic fan advertising uses high resolution and brightness, making it visually eye-catching. The 3D product displays are more realistic than traditional advertising methods, providing consumers with visually pleasing and engaging experiences.

5.4 Relationship Between Irritation and Consumer Attitudes

H3: 3D holographic fan advertising will be less irritating and have a negative correlation to consumer attitudes.

The relationship between irritation and consumer attitudes in advertising literature is not straightforward, with various authors reaching different conclusions. While many studies suggest a negative relationship, outcomes vary depending on the advertising medium or platform. For instance, Mahmut et al. (2023) found no statistically significant evidence that social media advertising negatively correlates with advertising value or attitude. Similarly, Abbasi et al. (2023) found no statistical evidence that social media image advertisements negatively influence consumer attitudes. This confirms that consumers might not feel irritated by looking at social media image advertisements.

In this study, a hypothesis (H3) was tested to determine whether consumers perceived 3D holographic fan advertising as irritating. Irritation demonstrated a moderate standardised coefficient of -0.15, indicating that reduced irritation improves positive consumer attitudes towards 3D holographic fan advertising. The results show that consumers did not find 3D holographic fans irritating. These findings align with those of Abbasi et al. (2021) and Disastra et al. (2018), who reported a negative correlation between irritation and consumer attitudes, which is statistically proven. Abbasi et al. (2021) showed that the irritation effect has an impact on consumer attitudes when consumers feel that advertisements are invading their personal space, and similarly, Disastra et al. (2018) demonstrated this outcome when considering mobile devices as personal space and having advertisements on mobile devices can be irritating, hence negatively affecting consumer attitudes. For this study, the 3D holographic fan did not invade consumers' personal space; it served mainly as a digital display; consumers had a choice to engage with the content.

5.5 Relationship Between Credibility and Consumer Attitudes

H4: Advertisements displayed from the 3D holographic fans are credible and will have a positive correlation on consumer attitudes.

Credibility is a key variable in determining attitude, as supported by various studies examining different advertising platforms (Abbasi et al., 2021; Martins et al., 2019; Sharma et al., 2022). This study investigated whether consumers perceived advertisements displayed on the 3D holographic fan as credible. The results confirm that consumers found these advertisements credible, aligning with the hypothesised

positive correlation (H4), which is statistically significant. The standardised coefficient of 0.14 suggests that the influence of credibility on attitude is moderate. This highlights the importance of credibility in shaping positive attitudes towards 3D holographic fan advertising. These findings align with Sharma et al. (2022), who observed that credibility is a significant predictor of consumer attitudes towards digital advertising. Similarly, Herrando and De Hoyos (2022) found that the credibility of influencer-endorsed advertisements positively impacts consumer attitudes. Realistic visuals created using 3D holographic fans were perceived as convincing and believable. Consequently, the credibility of 3D products and/or services significantly influences consumer attitudes.

5.6 Relationship Between Consumer Attitudes and Purchase Intention

H5: Positive attitudes towards advertisements displayed in the 3D holographic fan will positively correlate with consumer purchase intentions.

This study hypothesises that positive consumer attitudes towards 3D holographic fan advertisements influence purchase intentions (H5). The results indicate that the majority of consumers were likely to purchase products or services advertised on the 3D holographic fan, although a significant portion chose to remain neutral. The standardised coefficient of 0.19 demonstrates that positive attitudes have a measurable influence on purchase intentions. The hypothesis is accepted and supports that positive consumer attitudes towards 3D holographic fan advertisements enhanced behavioural intention to purchase a product.

The results align with the findings of previous studies where Bezbaruah and Brahmbhatt (2023) concluded that positive consumer attitudes towards podcast advertisements can lead to purchase intentions. Similarly, Disastra et al. (2018) on mobile advertising and Redda and Shezi (2022) also found similar conclusions on celebrity-endorsed advertisements.

5.7 Exploratory Findings

5.7.1 Relationship Between Informativeness and Purchase Intentions

The data indicated by the modified model strongly suggests a relationship between informativeness and purchase intention. This finding extends beyond the initially proposed conceptual model.

For this study, the results reveal a positive standardised coefficient of 0.18, and the outcome is statistically significant. This demonstrates that providing relevant information about products and services can positively influence purchase intentions. A similar relationship was highlighted by Cahyani and Artanti (2020), in their study on email marketing, where informativeness was identified as a predictor of online buying intentions.

5.7.2 Relationship Between Credibility and Purchase Intentions

The data also suggests that credibility is a strong predictor of purchase intentions. The study found that credibility positively influences purchase intentions, as evidenced by a strong positive standardised coefficient of 0.38 and a statistically significant relationship. This result aligns with findings from Sheeraz et al. (2016), who demonstrated that brand credibility positively impacts purchase intention in the context of fast-food restaurants and transport services. These findings indicate that consumers are more likely to purchase the advertised products and services when they perceive advertisements as credible.

5.8 Summary of Discussions

This study aimed to evaluate the 3D holographic fan advertising and its influence on consumer attitudes and purchase intentions by applying the SOR Theory combined with the advertising value model. Additionally, the study sought to determine whether positive consumer attitudes would lead to purchase intentions.

The attitudinal factors - informativeness, entertainment, irritation, and credibility - explaining 61% ($R^2 = 0.61$) are found to be strong predictors of consumer attitudes. Entertainment emerges as the most dominant predictor. Consumer attitudes coupled with informativeness and credibility explains 45% of the influence on purchase intentions. This confirms that they are strong predictors of purchase intentions. These

findings are consistent with those of other researchers (Cahyani & Artanti, 2020; Sheeraz et al., 2016).

CHAPTER 6: CONCLUSIONS

6.1 Conclusion of the Study

The study's primary objective was to examine the use of 3D holographic fans for advertising purposes. This was achieved by assessing how such advertising influences consumer attitudes by investigating attitudinal forms, including informativeness, entertainment, irritation, and credibility. The second objective was to evaluate the relationship between consumer attitudes influenced by holographic fan advertising and purchasing intentions.

The study followed a quantitative approach within the positivist research paradigm. Primary data was collected using a self-administered questionnaire distributed through a mall-intercept approach at the point of experience. The research context was South African restaurants within the City of Ekurhuleni. The final questionnaire consisted of 21 items adapted from Martins et al. (2019), Bezbaruah and Brahmbhatt (2023), Alalwan (2018), and Rausch & Kopplin (2021). The target population included individuals aged between 18 and 65. The study employed non-probability convenience sampling, with a total sample size of 390 participants.

The results revealed that informativeness, entertainment, and credibility, along with irritation, are predictors of consumer attitudes. Consumers perceived advertisements via 3D holographic fans to be informative, highly entertaining, credible, and non-irritating. The structural equation modelling (SEM) results showed that informativeness, entertainment, and credibility positively influence consumer attitudes and serve as predictors of consumer attitudes, aligning with the findings of Martins et al. (2019), with entertainment being the strongest predictor. Furthermore, irritation negatively influenced consumer attitudes and was also a predictor, consistent with Abbasi et al. (2021) and Martins et al. (2019).

The second part of the study examined conative actions, specifically whether consumer attitudes influence behavioural actions such as purchase intentions. Consumers demonstrated positive responses towards purchasing products displayed using 3D holographic fans. The SEM analysis indicated that positive consumer attitudes are predictors of purchasing intentions, consistent with Bezbaruah and

Brahmbhatt (2023). Additionally, the data showed that informativeness and credibility are predictors of purchase intentions.

This study tested five hypotheses (H1, H2, H3, H4, and H5), all of which were accepted. The findings suggest that, based on the advertising value model, 3D holographic fans can be considered effective marketing tools with significant potential to influence consumer buying behaviour and decision-making.

6.2 Theoretical Implications

This study makes several theoretical contributions. First, it is amongst the initial empirical investigations into the use of 3D holographic fan technology in advertising by applying the advertising value model and the SOR Theory. The study evaluates consumer attitudes and behavioural intentions regarding products displayed using this technology. Second, it offers insights into consumer perceptions of 3D holographic fan advertising, specifically focusing on the South African general public, spanning various age groups. Third, the research builds growing literature on how consumer attitudes influence purchase intentions (Rausch & Kopplin, 2021; Yaacob & Baroto, 2019). Fourth, it expands the literature on integrated marketing communication by examining 3D holographic fan technology as an effective marketing tool. It builds on the lack of adoption of 3D technologies in the DOOH marketing space, as alluded to by Roux (2018). Lastly, the study presents exploratory findings, demonstrating that informativeness and credibility of advertisements can directly influence purchase intentions. These findings reveal a relatively underexplored direct relationship between these variables and their impact on consumer purchase behaviour.

6.3 Managerial Implications

This study makes a significant practical contribution by encouraging media and advertising companies to adopt and leverage 3D holographic fan technology as a digital display medium, providing advertising space for marketers and advertisers. It also offers valuable insights into consumer behaviour towards this technology, enabling brands, marketers, and advertisers to effectively utilise 3D holographic displays to their benefit. Additionally, the study highlights opportunities for space providers, such as restaurants, to adopt this technology for displaying in-house products to drive sales.

The model proposed in this study provides practical guidance for managers on integrating 3D holographic fan technology into digital out-of-home marketing campaigns. Notably, the entertainment value of the displayed content significantly influenced consumer attitudes, followed by the credibility of the content. While information about products and services remains crucial, the findings demonstrate that such information can lead to purchase intentions. Therefore, managers can maximise the potential of this platform by creating content that is both informative and entertaining for consumers.

The strategic placement of these holographic fans is also crucial. Although they are visually engaging and attention-grabbing, this represents only the initial step in the marketing process. Managers and marketers must prioritise additional elements, such as product details, pricing, and other relevant information, to effectively guide consumers towards taking action.

6.4 Recommendations and Further Studies

Practitioners are encouraged to explore ways to incorporate 3D holographic technology into integrated marketing communications strategies. As this emerging technology begins to impact the advertising sector, its capabilities should be embraced. While it holds potential for mass marketing, its effectiveness is particularly pronounced in place-based settings, making it ideal for targeted marketing campaigns. To maximise its impact, the displayed content should be concise, emphasise 3D product models to enhance consumer engagement and experiences and focus on the entertainment element of the content.

Hologram technology in the marketing industry remains relatively understudied, presenting opportunities for further research. While this study focused on 3D holographic fans, other holographic technologies could be examined to assess their influence on consumer attitudes and behavioural intentions. A qualitative investigation into how industry practitioners perceive this technology, including their intentions to use or integrate it into product promotion efforts, would provide valuable insights into its potential success. Since holographic technology is known for its eye-catching appeal, a study focusing on its effectiveness in enhancing brand awareness could also fill critical gaps in the literature.

This study analysed perceptions across all age groups but did not delve into how individual age groups responded to the technology. Future research could explore these differences to identify which age groups are most influenced by 3D holographic advertising, aiding marketers in implementing more effective targeted campaigns. Additionally, this study could be replicated using alternative consumer behavioural models, as presented by Paz and Vargas (2023). Future studies can use other theories that match this study like the theory of planned behaviour (Ajzen, 1991) this theory can help give more understanding of consumer attitudes and behavioural intentions. Researchers could also examine variations in consumer perceptions in different geographic locations, comparing developing and developed nations.

In conclusion, this study makes significant contributions to advertising literature by highlighting the potential of emerging technologies for marketing practitioners. It provides insights into how South African consumers perceive 3D holographic fan technology for advertising purposes. Furthermore, it identifies opportunities for future research to explore the effectiveness of holographic technologies in marketing, addressing gaps in the existing literature.

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APPENDIX I: THE INSTRUMENT

Section A: Screening

1a. What age group do you belong to?

<18	
18 - 25	
26 - 35	
36 - 44	
45 - 64	
If you are below the age of 18 years or over 65 years, please do not continue with the questionnaire	

1b. On average how long did you spend at the restaurant?

< 30 minutes	
30 - 45 minutes	
46- 60 minutes	
61 - 90 minutes	
> 90 minutes	
If less than 30 minutes do not continue with the questionnaire	

1c. In the area you were seating did you see and interact with the 3D holographic fan device?

Yes	
No	

If no, please do not proceed with the questionnaire

Section B: Consumer attitudes

This section aim to examine your attitude toward advertisements displayed from the 3D holographic fan (Abbasi et al 2021; Alalwan, 2018; Barkett and Carr, 2001; Martins et al, 2019; Bezbaruah and Brahmbhatt, 2022)

Please indicate to what extent do you agree or disagree with the statements below:

1 = Strongly disagree; 2 = Disagree; 3 = Neutral; 4 = Agree; and 5 = Strongly agree

Informativeness	Strongly disagree	Disagree	Neutral	Agree	Strongly agree
3D holographic fan advertising provides timely information on products or services	1	2	3	4	5
3D holographic fan advertising provides relevant information on products or services.	1	2	3	4	5
3D holographic fan advertising is a good source of information	1	2	3	4	5

Entertainment	Strongly disagree	Disagree	Neutral	Agree	Strongly agree
3D holographic fan advertising is interesting.	1	2	3	4	5
3D holographic fan advertising is enjoyable	1	2	3	4	5
3D holographic fan advertising is entertaining	1	2	3	4	5
3D holographic fan advertising is pleasing.	1	2	3	4	5

Irritation	Strongly disagree	Disagree	Neutral	Agree	Strongly agree
3D holographic fan advertising is irritating.	1	2	3	4	5
3D holographic fan advertising is annoying.	1	2	3	4	5
3D holographic fan advertising is intrusive	1	2	3	4	5

Credibility	Strongly disagree	Disagree	Neutral	Agree	Strongly agree
3D holographic fan advertising is convincing.	1	2	3	4	5
3D holographic fan advertising is believable.	1	2	3	4	5
3D holographic fan advertising is credible.	1	2	3	4	5
3D holographic fan advertising is a good reference for purchasing products	1	2	3	4	5

Attitude towards holographic fan advertising	Strongly disagree	Disagree	Neutral	Agree	Strongly agree
I like 3D holographic fan advertising	1	2	3	4	5
I feel 3D holographic fan advertising is good	1	2	3	4	5
3D Holographic fan advertising is creative	1	2	3	4	5

Section C: Purchasing intentions

This section aim to examine purchase intention towards advertisements displayed from the 3D holographic fan (Alalwan, 2018; Rausch and Kloppin 2021).

Please indicate to what extent do you agree or disagree with the statements below:

1 = Strongly disagree; 2 = Disagree; 3 = Neutral; 4 = Agree; and 5 = Strongly agree

Purchase intentions	Strongly disagree	Disagree	Neutral	Agree	Strongly agree
I will buy products that are advertised on the 3D holographic fan	1	2	3	4	5
I intend to buy products that are promoted on the 3D holographic fan	1	2	3	4	5
I am likely to buy products that are promoted on the 3D holographic fan	1	2	3	4	5
I will strongly recommend others to purchase product/service advertised on the 3D holographic fan.	1	2	3	4	5

APPENDIX II: PILOT STUDY

A pilot study was conducted to evaluate the feasibility and reliability of the measurement instrument and to assess the overall study methodology. Additionally, the study aimed to determine whether the questions/statements effectively address the variables and to test the hypotheses. The tests will be conducted by assessing indicator reliability through factor loadings. This will be followed by evaluating construct reliability using Cronbach's Alpha (CA) and composite reliability (CR). The instrument will also be tested for convergent validity through the average variance extracted (AVE) and for discriminant validity. Finally, structural equation modelling will be performed to test the proposed hypotheses.

Data collection

The mall-intercept approach was used to distribute questionnaires to the respondents, a total of 65 questionnaires were distributed, two responses were incomplete and 63 were used for the pilot study. The sample includes restaurant customers and they were selected on the basis that they spent at least 30 minutes in the restaurant and they were seated in an area where they could interact with the 3D holographic fan advertising device. The sample was limited to pupils between the ages of 18 and 64. The questionnaire took between 5 to 10 min to complete. The purpose of the study was explained to respondents and the respondents consented to participate in the questionnaire.

Data processing

All 63 responses were processed. The data was entered into the Microsoft Excel spreadsheet for coding and the coded data was imported into the IBM® SPSS® Amos™ 29.0 software.

Pilot Study Results

The data was collected from the following age groups, 18-25 years (17.46%), 26-35 years (28.57%), 36-44 years (39.68%), and 45-64 years (14.29%) (Figure 1). The participants have at least spent minutes in an area where they could notice the advertisements from the 3D holographic fan the distribution shows that 9.52% of participants spent at least 30 to 45 minutes at the restaurant, 19.05% spent between

46 to 60 minutes, 22.22% spent 61 minutes to 90 minutes and 49.21% spent greater than 90 minutes (Figure 2). This is considered sufficient time to formulate an opinion about the 3D holographic fan advertisements.

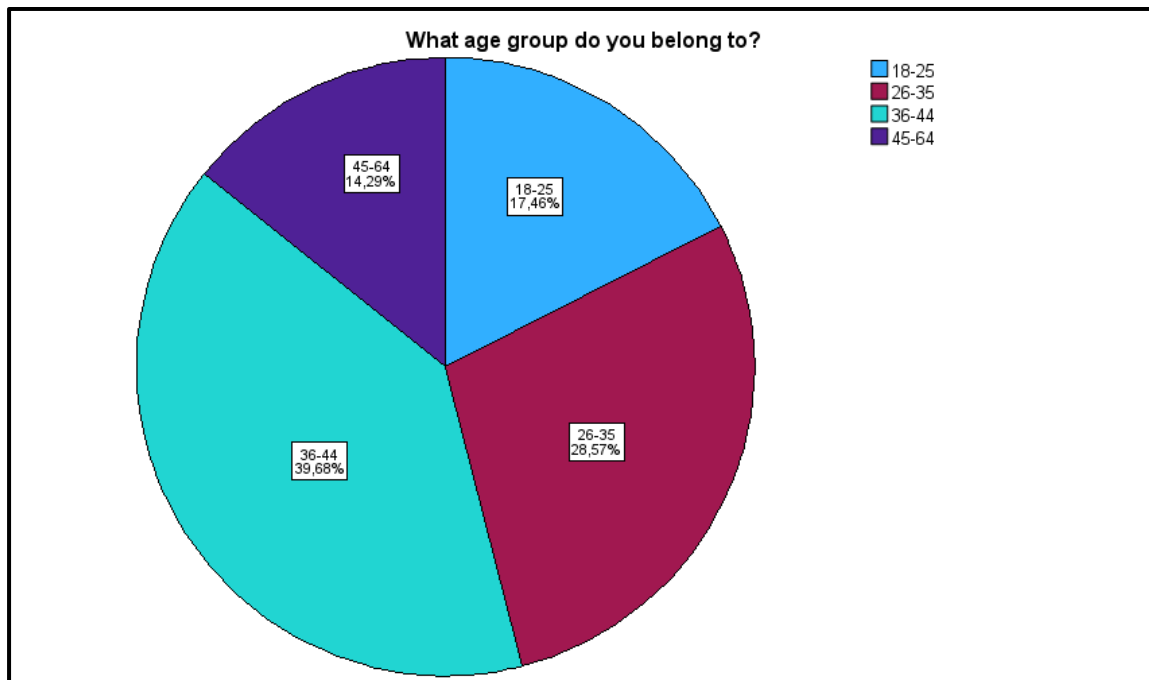


Figure 26: Age group distribution and average time spent interacting with the advertisement display from the holographic fan.

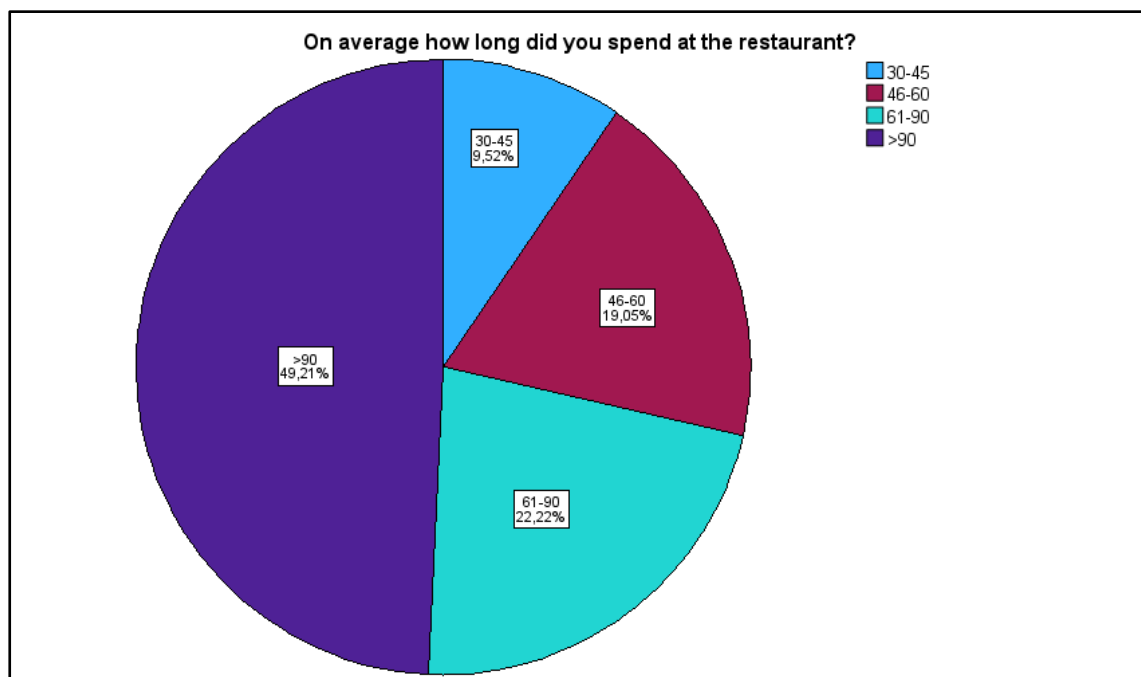


Figure 27: Duration spent at the restaurant.

Construct reliability and validity

Reliability tests were conducted on all constructs (Table 1) using Cronbach's Alpha (CA). The results indicate that Cronbach's Alpha exceeds 0.8 for all variables, confirming reliability. A confirmatory factor analysis was performed using multi-factor path diagrams to obtain standardized factor loadings (Figure 3). The standardized factor loadings exceed 0.6, demonstrating indicator reliability. These factor loadings were used to calculate composite reliability and average variance extracted (AVE). All variables have a composite reliability greater than 0.8, confirming instrument reliability. Additionally, an AVE greater than 0.5 was achieved for all variables. However, the informativeness maximum shared value of 0.677 exceeds 0.613, raising concerns about the validity of the instrument (Table 1).

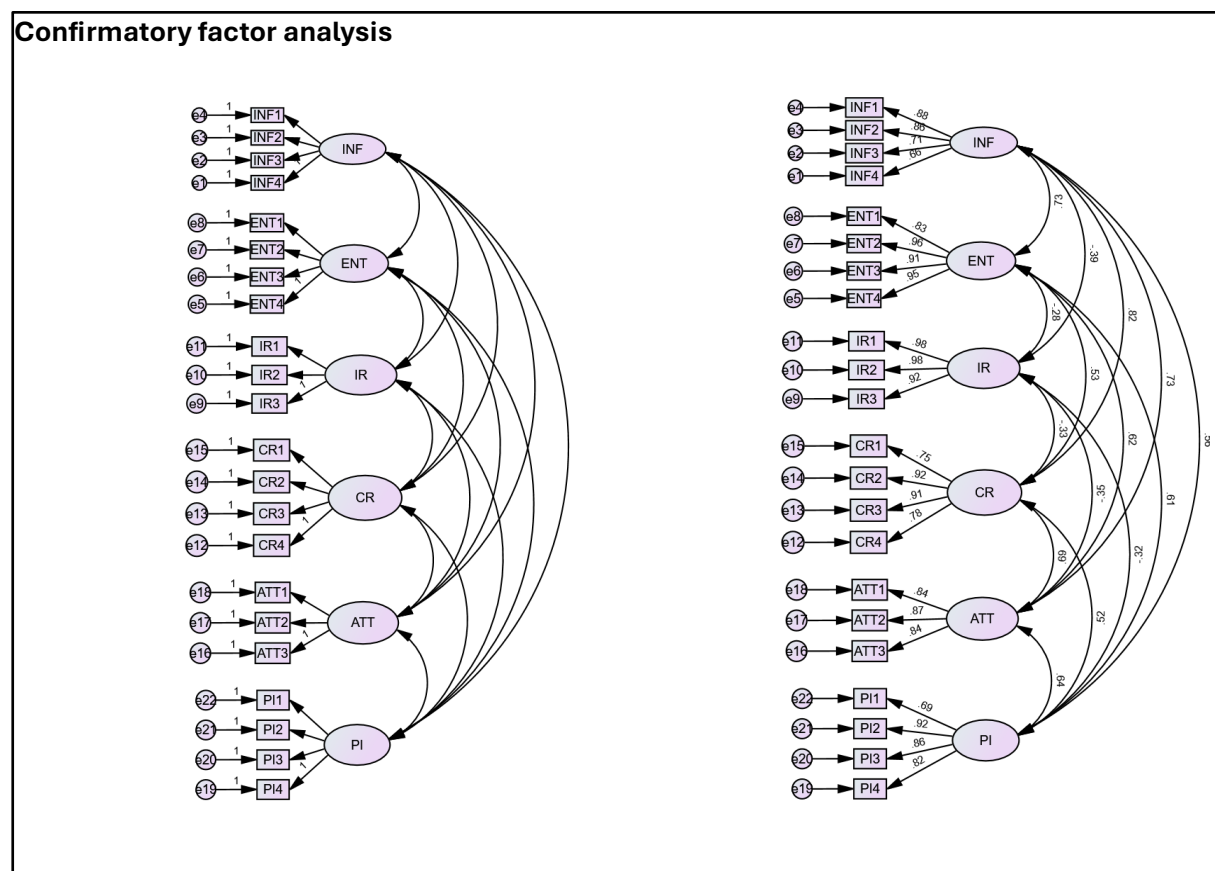


Figure 28: a) Multi-factor path diagram to be tested, b) Multi-factor path diagram with standardized factor loadings.

Table 6: Reliability and Validity

Variables/Constructs	Items	Standardized factor loading	Cronbach Alpha	Composite Reliability	Average variance extracted	Maximum shared variance
Informativeness	INF1	0.877	0.853	0.862	0.613	0.677
	INF2	0.863				
	INF3	0.709				
	INF4	0.660				
Entertainment	ENT1	0.834	0.949	0.952	0.832	0.529
	ENT2	0.958				
	ENT3	0.905				
	ENT4	0.947				
Irritation	IR1	0.980	0.973	0.973	0.924	0.154
	IR2	0.979				
	IR3	0.924				
Credibility	CR1	0.750	0.900	0.907	0.712	0.677
	CR2	0.917				
	CR3	0.913				
	CR4	0.781				
Attitude	ATT1	0.841	0.886	0.889	0.727	0.539
	ATT2	0.874				
	ATT3	0.843				
Purchase intention	PI1	0.686	0.888	0.907	0.682	0.416
	PI2	0.918				
	PI3	0.859				
	PI4	0.823				
Model fit: X2 =335.72, df = 194, X2/df = 1.731, RMR = 0.029, GFI = 0.728, CFI = 0.896, RMSEA = 0.109						

Discriminant validity

Discriminant validity was tested by using the Fornell-Larcker criterion (Fornell and Larcker, 1981) which states that the root square of AVE must be greater than any correlation of the variables. The root square of AVE for informativeness is less than the correlation value of credibility, and this confirms that there is a discriminant validity issue.

Table 7: Discriminant validity

	CRe	AVE	ATT	INF	ENT	IR	CR	PI
ATT	0.889	0.727	0.853					
INF	0.862	0.613	0.734	0.783				
ENT	0.952	0.832	0.617	0.727	0.912			
IR	0.973	0.924	-0.354	-0.392	-0.276	0.961		
CR	0.907	0.712	0.688	0.823	0.528	-0.332	0.844	
PI	0.895	0.682	0.645	0.564	0.610	-0.320	0.520	0.826

Bold diagonal values are the root square of the AVE, and off-diagonal values are from the correlation matrix of variables.

Solution

The data indicates issues with discriminant validity due to a high correlation between informativeness and credibility. Each item was assessed individually, and Item INF4 demonstrated poor factor loading with other informativeness items. Instead, it loaded with credibility. As a result, Item INF4 was removed from the assessment. A second set of measurement model tests was conducted without Item INF4, beginning with the multi-factor path diagram (Figure 4).

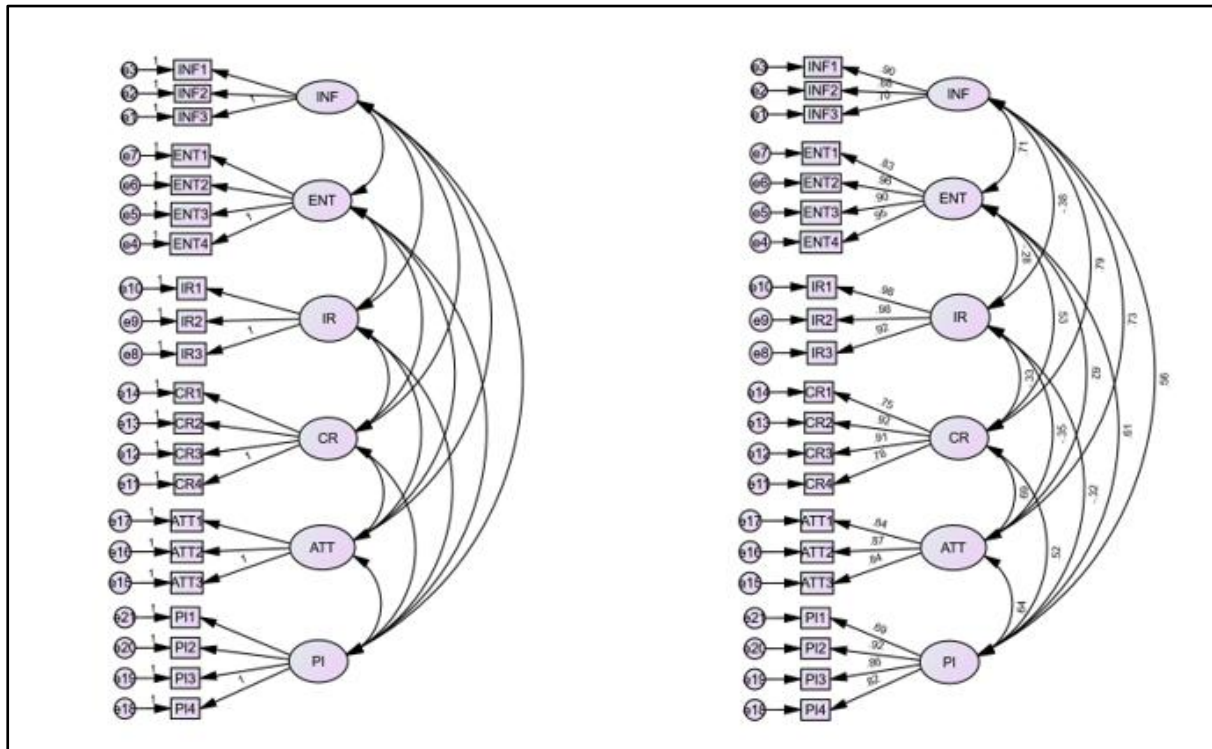


Figure 29: a) Multi-factor path diagram to be tested, b) Multi-factor path diagram with standardized factor loadings, without item INF4

Cronbach's Alpha (CA) was tested for all variables, and the results show that CA is greater than 0.8, confirming reliability. Secondly, the standardized factor loadings exceed 0.6, indicating that indicator reliability is achieved. These factor loadings were used to calculate composite reliability and average variance extracted (AVE). All variables have a composite reliability greater than 0.8, confirming instrument reliability. Additionally, an AVE greater than 0.6 was achieved for all variables. The informativeness maximum shared variance is now lower than the AVE, resolving the initial validity issue (Table 3).

Table 8: Reliability and validity without INF4.

Variables/Constructs	Items	Standardized factor loading	Cronbach Alpha	Composite Reliability	Average variance extracted	Maximum shared variance
Informativeness	INF1	0.897	0.860	0.867	0.687	0.624
	INF2	0.875				
	INF3	0.701				
	-	-				
Entertainment	ENT1	0.833	0.949	0.952	0.831	0.504
	ENT2	0.958				
	ENT3	0.904				
	ENT4	0.947				
Irritation	IR1	0.980	0.973	0.973	0.924	0.144
	IR2	0.979				
	IR3	0.924				
Credibility	CR1	0.750	0.900	0.907	0.712	0.624
	CR2	0.918				
	CR3	0.912				
	CR4	0.781				
Attitude	ATT1	0.841	0.886	0.889	0.728	0.531
	ATT2	0.875				
	ATT3	0.843				
Purchase intention	PI1	0.686	0.888	0.895	0.682	0.416
	PI2	0.918				
	PI3	0.859				
	PI4	0.823				
Model fit: X2 =306.62, df = 174, X2/df = 1.762, RMR = 0.029, GFI = 0.729, CFI = 0.900, RMSEA = 0.111						

Discriminant validity was tested for by using the Fornell-Larcker criterion (Fornell and Larcker, 1981) which states that the root square of AVE must be greater than any correlation of the variables. The results show that the root square of AVE is greater than the correlation of the variables (Table 4).

Table 9: Discriminant validity without INF4

	CR	AVE	ATT	INF	ENT	IR	CR	PI
ATT	0.889	0.728	0.853					
INF	0.867	0.687	0.729	0.829				
ENT	0.952	0.831	0.617	0.710	0.912			
IR	0.973	0.924	-0.354	-0.379	-0.276	0.961		
CR	0.907	0.712	0.688	0.790	0.528	-0.332	0.844	
PI	0.895	0.682	0.645	0.562	0.610	-0.320	0.520	0.826

Bold diagonal values are the root square of the AVE, and off-diagonal values are from the correlation matrix of variables.

Structural Equation Modelling: Hypothesis testing

The measurement model is now satisfactory without Item INF4. The data can be analyzed using structural equation modeling to test the hypotheses. The following conceptual model is tested (Figure).

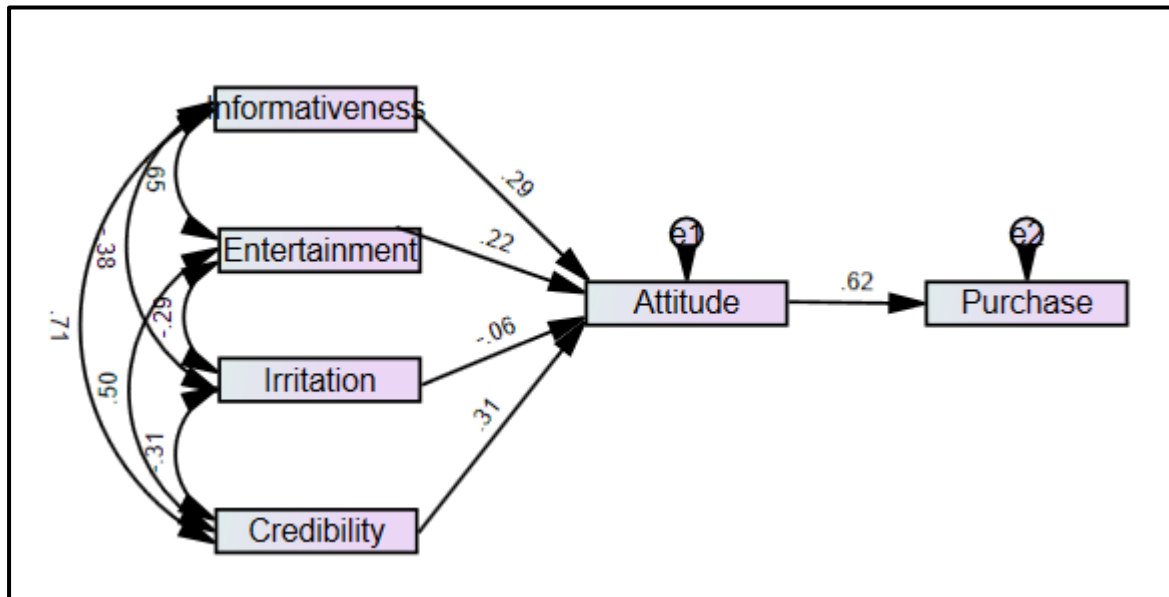


Figure 30: Tested conceptual model.

Model fit was analysed to assess if the observed data fits the proposed model. The following fit indices are assessed; X² (Chi-square) probability (degree of freedom) X²/Df (Chi-square ratio), RMR (Root Mean Residual), GFI (Goodness of Fit Index), CFI (Comparative Fit Index), NFI (Normed Fit Index), RMSEA (Root Mean Square Error of Approximation). The results are as follows (Table 5).

Table 10: Model fit outcomes

Model fit	Value	Outcome
X ²	8.515	
df	4	
X ² /df	2.12875	Good
p.value	0.074	Good
RMR	0.386	Bad
GFI	0.959	Good
CFI	0.972	Good
NFI	0.951	Good
RMSEA	0.135	Bad

The model fit shows an overall acceptable outcome, with only RMR and RMSEA indicating poor fit, which may be due to the sample size. However, other fit indices demonstrate a good fit, making the model suitable for hypothesis testing (Table 6).

Table 11: Hypothesis testing results

Dependant variable	Path	Independent variable	Hypothesis	Estimate	S.E.	C.R.	P	Outcome	Result
Attitude	<---	Informativeness	H1	0.33	0.165	1.994	0.046	Positive, borderline significant	Accepted
Attitude	<---	Credibility	H4	0.208	0.084	2.462	0.014	Positive significant	Accepted
Attitude	<---	Irritation	H3	-0.062	0.091	-0.676	0.499	Negative, not significant	Rejected
Attitude	<---	Entertainment	H2	0.144	0.074	1.932	0.053	Positive, borderline not significant	Rejected
Purchase	<---	Attitude	H5	0.939	0.15	6.278	***	Positive, significant	Accepted

APPENDIX III: PARTICIPATION INFORMATION SHEET

The University of the Witwatersrand
Wits Business School



Dear Sir / Madam

Questionnaire: 3D holographic fan advertising and its influence on consumer attitudes and purchase intentions.

Thank you for your attention to this academic questionnaire.

My name is Ripfalo Peace Hlungwani. I am a master's student in Business Administration at the University of the Witwatersrand, Johannesburg. My supervisor is Dr Yvonne Saini. I am conducting a research study about consumer attitudes and purchase intention. The study title is *3D holographic fan advertising and its influence on consumer attitudes and purchase intentions*.

I am inviting you to answer a questionnaire, all sections should be answered fully. Please read instructions carefully before answering any questions. If you decide to take part, your participation in this research study will last about 5 to 10 mins.

If you decide to take part in the research study, it should be because you want to volunteer. You do not have to take part. You can stop being in the study at any time. You will not be asked to provide any identification information and if so, your identity and responses will remain anonymous. This research is for academic purposes only and the information obtained will be kept strictly confidential.

If you have any questions during or afterwards about this research study, feel free to contact me or my supervisor on the details listed below. If you have any concerns or complaints about the ethical procedures of this research study, you are welcome to contact the University Human Research Ethics Committee (Non-Medical), telephone +27(0) 11 717 1408, email hrecnon-medical@wits.ac.za.

Yours sincerely,

Ripfalo Peace Hlungwani

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Supervisor:

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APPENDIX IV: CONSENT FORM

Title of project: 3D holographic fan advertising and its influence on consumer attitudes and purchase intentions.

Name of researcher
Ripfalo Peace Hlungwani

I,, agree to participate in this research project.

I agree to the following:

(Please circle the relevant options below)

The research study was explained to me. I understand what this study is about.	YES	NO
I understand that I can volunteer to take part in the study	YES	NO
I agree that the responses may be used by the researcher in their research report.	YES	NO
I agree that my participation will remain anonymous (my name or other identifying data will not be used by the researcher in their research report)	YES	NO
I agree that other researchers may use responses I provide in the questionnaire (depending on their own ethics clearance being obtained) but my name and any personal information will not be used or passed on	YES	NO

..... (signature)
..... (name of participant)
..... (date)

..... (signature)
..... (name of researcher/person seeking consent)
..... (date)