

An Empirical Study on the Influencing Factors of Customers' Acceptance Intention towards Online Behavioral Advertising

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Abstract: Big data mining and analysis technology greatly influence the development of the advertising industry. In order to capture large information on consumers' online behaviour, cookie files and Hadoop are widely adopted by advertisers to reach targeted consumers, which leads to online behavioural advertising. Based on an empirical study, this research mainly analyzes the factors influencing customers' acceptance intention towards OBA from developing a conceptual framework. By collecting data through questionnaires and using SPSS and AMOS for data analysis, the result indicates that the factors of performance expectancy, effort expectancy, social influence and facilitating conditions have a positive relationship with customer acceptance intention. Moreover, performance expectancy, effort expectancy, and facilitating conditions have a positive relationship with attitudes towards OBA. However, attitudes do not positively impact customer acceptance intention and social influence has no significant relationship with attitudes, which could attribute to privacy concern and the rising of personality consciousness respectively. The result of this study is of great significance to the way of improving advertising effectiveness.

Keywords: attitudes; big data; customer acceptance intention; online behavioural advertising

1 INTRODUCTION

Big data has evidently transformed the advertising industry as well as many other industries. Based on the technology of data mining and analysis of big data, the advertising industry has undergone great changes. The most direct impact of big data on advertising lies in the fact that advertising media can achieve accurate advertising driven by data collection and analysis. With the help of big data mining and analysis technology, the advertising ecology with advertisers, advertising media and advertising audience as the core are undergoing profound changes. On the one hand, advertisers can make advertisements deliver to the right audience at the right time, through the right media, in the right way. On the other hand, with the support of the data provided by both sides of the advertising supply and demand and the data management side, advertisers can automatically purchase and place advertisements through the advertising trading platform [1]. As a new form of online advertising, online behaviour advertising (OBA) has developed into the most popular format in today's digital world, which helps advertisers generate insights into prospective buyers by tracking their digital footprint and also caters for technology-savvy consumers.

Nowadays, with the increase of customer characteristics and the number of outputs, marketers are facing a large amount of structured data such as customer details, orders and products, as well as unstructured data including social media, web data and search history. As a result, marketers normally adopt data processing techniques such as cookie files and Hadoop in order to capture customer purchasing patterns, backgrounds and favorites. In this way, OBA has developed based on harnessing big data to improve ad effectiveness. In the global context, these personalized ads are very popular and effective. For example, most online retailers and other businesses such as Amazon, Stitch Fix, eBay, Henrys, etc. use those behavioural ads to attract customers [2]. In 2018, 44% of global advertising expenses would be spent on digital media and a large proportion of cost would be going to OBA [3].

With the help of big data mining and analysis technology, OBA can better realize the real-time and precise connection among the demand side, the supply side and the advertising media. Timely and accurate data feedback and trackable conversion rates are very helpful in reducing advertising costs. The phenomenon of "half the money I spend on advertising is wasted" proposed by John Wanamaker in the 19th century has decreased significantly [4]. However, consumers' willingness to accept OBA is quite crucial in determining whether OBA can achieve the expected results and achieve a win-win situation for advertisers, advertising media and consumers. In addition, the practice of online behavioural advertising is still one of the hottest issues in contemporary debates as it may violate consumers' privacy. Chen [5] suggested that 66% of people are not willing to accept customized advertising based on their personal interest, and the proportion increased to 73% - 86% when they know their personal information is collected. Based on the above, the unified theory of acceptance and use of technology model (UTAUT) is adopted in this paper, which is used for understanding user acceptance and perception behaviour. In addition, the factor of attitudes toward advertising is added as a new variable to develop a conceptual framework of investigating factors that influence peoples' acceptance intention towards online behavioural advertising.

2 LITERATURE REVIEW

2.1 Online Behavioural Advertising (OBA)

Many researchers have offered definitions of OBA. According to Ham and Nelson [6] OBA is "a technology-driven advertising personalization method that enables advertisers to deliver highly relevant ad messages to individuals". In order to regulate the OBA, the US Federal Trade Commission gives the most concise definition of OBA as tracking a consumer's online activities over time including the searches the consumer has conducted, the web pages visited and the content viewed in order to deliver advertising targeted to the individual consumer's interests [7]. These definitions show the characteristics of tracking customers' online behavior and collecting data for

individualized ads. As a result, OBA can be defined as collecting data based on tracking consumers' online behaviour to show individually targeted ads.

Based on the big data, some researchers focused on the technologies of realizing the effective connection between advertising and the real demands of consumers. Wang [8] designed a new type of integrated advertising platform using Java language and following the J2EE specification. The whole platform consists of advertising maintenance material, background system with advertising rules, advertising matching service, Client Library for JavaScript, user behaviour collection and analysis system. The implementation of the platform includes three stages: the implementation of the advertising release system, the implementation of the user behaviour collection system, the implementation of the user behaviour analysis and the advertising recommendation system. Through the interactive application of distributed technology of Spark and Solr, Han [9] has improved the technology of efficient storage and fast retrieval of massive data by giving full play to the advantages of parallelization of both.

In terms of OBA, the implementation process is shown in Fig. 1. When an audience opens a webpage with

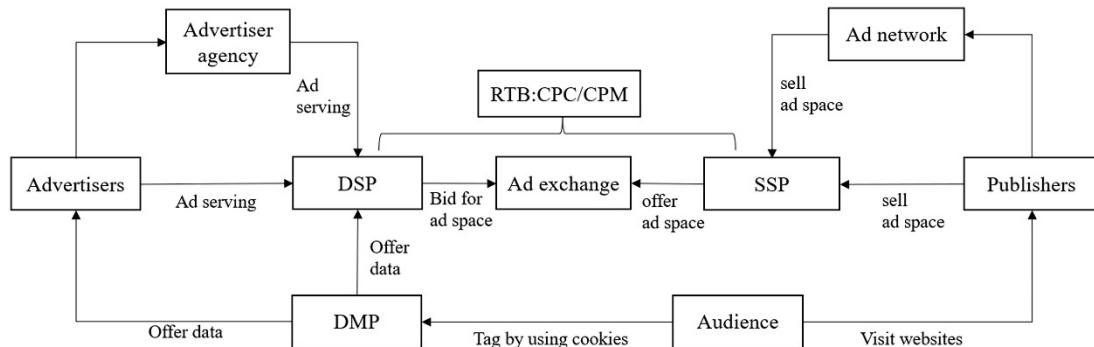


Figure 1 OBA Implementation Process

Compared to other forms of online advertising, OBA is personally relevant. On the one hand, marketers can deliver an advertising message based on consumers' preferences and needs, which can increase the accuracy and effectiveness of advertisement dissemination. On the other hand, it enables consumers to shorten the information gathering process and greatly reduce the time required for consumers to purchase. However, the intimating trait of OBA may lead to ethical issues, which could influence customer attitudes of using OBA.

2.2 Performance Expectancy (PE)

Performance expectancy (PE) is used to characterize the extent to which an individual believes that using the system will help improving productivity and performance of work [11]. In prior research, PE has been suggested to play an important role in adopting new technology or innovations. For example, in social media advertising and mobile advertising studies, Jung et al. [12] proposed that consumers would get more satisfaction with ads if they feel the advertising messages enable them to gain more information about the products they want, such as the feature, quality and price. Richard further suggested that it is important for marketers to have the capability of delivering appropriate content and up-to-date information

advertising on it, when the page loads the advertising, the supply side (including publishers and ad networks) will send a supplied message to the advertising exchange platform (ad exchange). After the ad exchange receiving messages from the Supply Side Platform (SSP), it will send those messages to the demand side (including advertisers and advertiser agency). Then the Demand Side Platform (DSP) will tell the ad exchange the price of the advertisement through calculation, which is based on the Real-Time Bidding technology (RTB, including CPM-Cost Per Mille and CPC-Cost Per Click). After selecting the most suitable bidder from the price of each DSP, the ad exchange will give the DSP the exposure of the advertisement and return the advertisement provided by the DSP to the SSP. Eventually, the supply side will display the advertisement. However, all of this is inseparable from data support, which requires the Data Management Platform (DMP) to provide relevant data and analyze it. DMP segments the data into tags to match the corresponding audience. This process is mainly achieved through cookies [1, 10]. The entire OBA implementation process can help advertisers make real-time decisions and spend their advertising cost where it is most needed.

to consumers effectively, which is illustrated in the term of "informativeness" [13]. With regard to the personalization characteristic of OBA, Zhang [14] suggests that offering personalized ads or location-based promotions could be an effective way of improving ad quality, which can facilitate consumers' acceptance intention. In addition, Leppaniemi and Karjaluoto [15] considered that when users feel the benefits of ads such as saving purchase time and obtaining information conveniently, they are more likely to accept mobile advertising. As a result, in the context of OBA, PE means that the acceptance of ads depends on if users can gain exact and up-to-date information easily and if the ads information can improve purchasing efficiency. Based on those researches, the study assumes that PE can positively influence consumers' acceptance intention of OBA. This leads to the following hypothesis:

H1: Performance expectancy has a positive relationship with consumer acceptance intention towards OBA.

2.3 Effort Expectancy (EE)

The concept of perceived ease of use is suggested in the TAM model, which is further re-termed as Effort Expectancy (EE) in the UTAUT model [16]. It refers to the extent of ease for people to use technology. In prior

research, the ease of use is widely used as a predictor of adopting new technology. For example, in the context of a mobile service system, Chong [17] suggested that the complexity of the service system could impact customers' intention of using mobile services. Bakar [18] also found that 93% of consumers take easy handling of the system as the most important factor of the acceptance of using mobile payment procedures. 81% of consumers specifically suggested that the ease of learning the system is quite crucial. As a new type of advertising technology, OBA has a similar usage scenario to other mobile services such as mobile payments to a certain extent. Therefore, based on other related studies and common experience, EE in the OBA context means that customer acceptance intention is influenced by the ease of understanding OBA contents and using OBA to purchase products. Thus, H2 is proposed:

H2: Effort expectancy has a positive relationship with consumer acceptance intention towards OBA.

2.4 Social Influence (SI)

Venkatesh et al. defined social influence as the extent to which individuals consider people who are important to them will use the new technology [16]. That is to say, people whose opinions are that consumers' value could play a crucial role in consumers' attitudes. In this case, Jung et al. [12] proposed that family members, friends, colleagues and superiors have a strong impact on users' acceptance intention towards the technology. Wais and Clemons [19] suggested that consumers are more likely to accept promotional content recommended by their friends. Jung et al. [12] also found that social influence significantly impacts users' acceptance intention of ads by examining the antecedents of behavioural intention towards social media advertising.

In the 2010s, advertising has been immensely introduced to the online market. On account of the penetration of online ads, customers have become aware of using online ads such as through social media to collect products or brand information they want. The social trend would have an impact on online ad acceptance. In the mobile marketing area, Noor et al. proposed that social influence play an important role in mobile marketing, because it will influence whether consumers purchase products or service by using their mobile phone [20]. Under the OBA context, SI means that the customer acceptance intention of OBA is influenced by both important social circles and current trends. As such, the research assumes that SI can positively influence customer acceptance intention towards OBA and H3 is suggested below:

H3: Social influence has a positive relationship with consumer acceptance intention towards OBA.

2.5 Facilitating Condition (FC)

Facilitating condition is defined as consumers' perception of the availability of resources and support to adopt the technology [16]. Resources such as IT knowledge, software and hardware from both consumers and marketers will impact acceptance intention towards the new technology or service. A previous study about internet marketing shows that facilitating conditions are positively related to the acceptance intention of using internet

marketing by consumers in both Malaysia and South Korea [21]. In the literature of mobile banking, Joshua and Koshy [22] proposed that the ease of accessing computers or the internet could significantly influence the adoption rate of mobile banking.

In the area of mobile apps, a smartphone with the whole day's internet connectivity is an important condition for users to determine whether to use mobile apps. As internet connectivity is a major concern in India, people in India consider 4G as an essential factor in adopting mobile service [23]. OBA is also closely associated with the internet. Based on former research, FC in the OBA context means that the acceptance of ads depends on the ease of getting technical support, such as internet accessibility and product purchase instructions. As such, H4 is suggested as follows:

H4: Facilitating condition has a positive relationship with consumer acceptance intention towards OBA.

2.6 Attitudes toward OBA (ATO)

Regarding the research on the definition of attitudes toward advertising, scholars have unanimously promoted the definition proposed by Lutz [24]. He believes that attitudes toward ads are a kind of psychology that people respond to specific advertisements in a way that they like or dislike. Zhou [25] believes that attitudes toward ads refer to the overall psychological tendency of people to the content or form of advertising. Similar to the three elements of attitude, advertising attitude is also expressed as people's cognitive tendency, emotional expression and behaviour tendency.

Consumers' attitude toward advertising is a prerequisite for consumers' purchase intentions and behaviours. In the context of online ads, Shen [26] first built a consumer attitude model for mobile advertising based on the Internet advertising model. Five factors that affect consumer advertising attitudes were identified, namely the credibility, entertainment, interaction, interest and interference of advertising. In addition, taking the users' attitude as the mediating variable, the acceptance intention towards mobile advertising is proven to be significantly influenced by the attitude. Based on the former studies, H5 is proposed here:

H5: Attitudes toward OBA have a positive impact on customer acceptance of OBA.

Online behavioural advertising is a technique that marketers use to deliver advertisements based on consumer interests and needs. As the product information, brand information, or promotional information conveyed by the advertisements can meet consumers' demands, it will increase consumer perceived usefulness, which helps them naturally form a positive attitude towards OBA. Tam & Ho [27] pointed out that when advertisements are consistent with consumers' purchase goals or self-images, they will increase the perceived usefulness of consumers and further facilitate consumers to explore the content of advertisements and reduce customers' doubts and avoidance about advertising. Therefore, the more useful the information transmitted by OBA is, the more positive the consumer's attitude towards OBA. Combined with the definition of PE, H6 is suggested here:

H6: Performance expectancy has a positive

relationship with attitudes toward OBA.

Based on the technology acceptance model, Luna-Nevarez, C. & Torres, I. M. [28] explored consumer attitudes to social network advertising and found that perceived ease of use positively affected consumer attitudes to social network advertising. Surveys have shown that users who think that social network advertising is clear, easy to understand and read have a more positive attitude towards social network advertising. Rodgers & Thorson [29] proposed that the composition of advertisements (including the types, forms, and characteristics of advertisements) on social networking sites and other online media determines the degree of consumer's cognitive efforts to process advertisements. OBA delivers one-on-one advertisement by excavating the specific preferences of audiences, which can more accurately spread advertisements to target consumers. This enables consumers to quickly and easily obtain the information they need, which will increase the consumer perceived ease of use of OBA. Thus, H7 is proposed here:

H7: Effort expectancy has a positive relationship with attitudes toward OBA.

In the mobile advertising area, López et al. [30] perceive that social influence will have a significant influence on users' decisions to adopt mobile internet. Chang et al. [31] highlighted the crucial role of the social group in the attitudes related to the new technology. As in the context of OBA, mobile devices are also an important way to display ads, H8 is suggested here:

H8: Social influence has a positive relationship with attitudes toward OBA.

Ali et al. [32] mentioned that the factors of connectivity, efficiency and system reliability are considered as positive factors that can reduce the mental cost of users, which has a positive influence on attitudes towards adopting the new technology. Gu [33] suggested that facilitating conditions are the antecedents of perceived usefulness and perceived ease of use. Based on the definition of facilitating conditions, H9 is suggested here: H9: Facilitating condition has a positive relationship with attitudes toward OBA.

According to the previous study and the above hypotheses, the relationship between variables and hypotheses is shown in Fig. 2, which also constitutes the conceptual framework of this study.

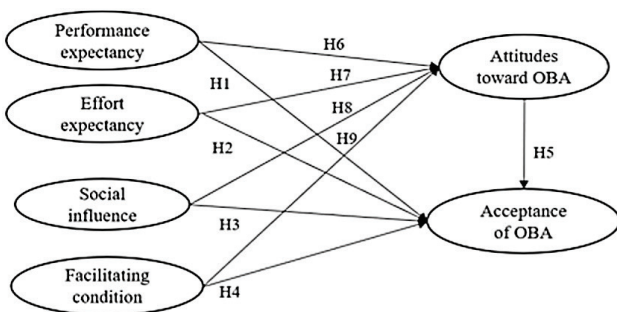


Figure 2 The Conceptual Framework

3 METHOD

3.1 Questionnaire Design

Based on previous research of variables, questionnaire items are designed by being adjusted according to the OBA

context. In order to measure six variables in the conceptual framework, 19 question items are suggested. PE adopts four-question items from Richard & Meuli [13], Wong et al. [11], Jung et al. [12] and Leppaniemi & Karjaluoto [15]. EE is measured by the scale of the research from Venkatesh et al. [16], Chong et al. [17] and Bakar [18]. SI adopts the scale from Wais & Clemons [19], Noor et al. [20] and Jung et al. [12]. FC adopts two question items from Joshua & Koshy [22] and J. Arenas [23]. ATO is measured by the scale of Shen [26], while AO adopts the source from Venkatesh et al. [16] to be the measurement scale (see in Tab. 1). In this research, every measurement item is measured by using the five-point Likert scale. 1 for 'Strongly Disagree', 2 for 'Disagree', 3 for 'Undecided', 4 for 'Agree' and 5 for 'Strongly Agree'.

3.2 Sample Description

300 questionnaires were issued on the 1st of September and collected on the 15th of September. The response rate is about 75% and 213 valid questionnaires are analyzed. Online questionnaires are mainly used for the research object of Chinese university students aged 18 to 22. As young students occupy a high proposition of population on online shopping, they are more likely to receive OBA.

Table 1 Questionnaire Design

Construct	Question Item	Source
PE	OBA helps me keep up-to-date about products I need	Richard and Meuli [13]
	OBA can provide information about products I need	Wong et al. [11], Jung et al. [12]
	OBA can save my time of purchasing products	Leppaniemi and Karjaluoto [15]
	OBA enables me to get products information more easily	Wong et al. [11], Jung et al. [12]
EE	OBA is easy to access	Venkatesh et al. [16], Bakar [18]
	Using OBA to purchase products does not require much effort	Venkatesh et al. [16], Bakar [18]
	The content of OBA is clear	Chong et al. [17]
	My interaction with OBA is understandable	Chong et al. [17]
SI	Friends and family members will influence my opinion of OBA	Wais and Clemons [19]
	Current trends will influence my opinion of OBA	Noor et al. [20], Jung et al. [12]
	Mass media will influence my opinion of OBA	Noor et al. [20], Jung et al. [12]
FC	The internet is stable when I use OBA to purchase products	Joshua and Koshy [22], J. Arenas et al. [23]
	It is easy for me to get support when there is a problem about using OBA to purchase products	Joshua and Koshy [22], J. Arenas et al. [23]
ATO	Using OBA is a good idea.	Shen [26]
	I have an impulse on using OBA.	
	I feel pleasure to use OBA.	
AO	I pay attention to OBA popped online	Venkatesh et al. [16]
	I am willing to use OBA to purchase products	
	I would like to recommend others to use OBA to purchase products	

4 ANALYSIS

4.1 Reliability and Validity

In this research, AMOS24.0 and SPSS24.0 software are used to test reliability and validity. The Cranach's Alpha reliability test is used to analyze the reliability of variables in this study. As for the minimum acceptable Cronbach's α value is 0.7, we can find in Tab. 2 that all values are consistent and reliable, which is regarded as good reliability of the scale of this paper.

In terms of the validity of the analysis, Tab. 3 is shown below. It is seen that all the factors' loading is greater than 0.6. Based on experience, the value that is greater than 0.4 can be used in analyzing validity. In addition, the chi-square value in Bartlett's Test of Sphericity is 2548.804. The value of degrees of freedom is 171 and the significance level is 0.000. That is to say, the scale has good content validity.

Table 2 Reliability Test

Variables	Number of entry	Cronbach's α	Consistency
Performance expectancy	4	0.862	Good
Effort expectancy	4	0.911	Good
Social influence	3	0.854	Good
Facilitating condition	2	0.795	Acceptable
Attitudes toward OBA	3	0.888	Good
Acceptance of OBA	3	0.864	Good

Table 3 Validity Test

	Composition					
	1	2	3	4	5	6
EE4	0.886	-0.203	0.034	-0.010	-0.133	-0.051
EE3	0.858	-0.128	-0.008	-0.063	-0.125	-0.082
EE2	0.851	-0.157	-0.068	0.009	-0.127	-0.058
EE1	0.837	-0.189	-0.074	-0.009	-0.146	-0.063
PE1	-0.169	0.843	0.105	0.142	0.210	0.048
PE2	-0.157	0.752	0.184	0.147	0.248	0.055
PE4	-0.181	0.723	0.142	0.184	0.105	0.144
PE3	-0.363	0.700	0.129	0.149	0.159	0.189
ATO1	0.005	0.232	0.886	0.120	0.116	0.080
ATO2	-0.035	0.162	0.873	0.056	0.085	0.212
ATO3	-0.075	0.061	0.827	0.266	0.158	0.060
AO1	0.013	0.145	0.066	0.858	0.213	0.193
AO2	-0.021	0.159	0.219	0.833	0.158	0.062
AO3	-0.043	0.196	0.141	0.809	0.076	0.143
SI3	-0.170	0.224	0.120	0.126	0.814	0.187
SI2	-0.233	0.243	0.171	0.158	0.754	0.165
SI1	-0.227	0.242	0.140	0.294	0.713	0.211
FC2	-0.127	0.175	0.109	0.250	0.198	0.826
FC1	-0.102	0.136	0.253	0.152	0.273	0.797

4.2 Structural Model and Path Verification

Amos 24.0 is mainly used to investigate the relationship between variables and model structure establishment. In this model, $GIF = 0.919$, which is greater than 0.90. $AGFI = 0.887$, which is greater than 0.80. $RMSEA = 0.042$, which is less than 0.80. In addition, the P value is close to 0. The results show that the structural model can meet the adaption criteria.

As shown in Tab. 4, with regard to the Pearson's Correlation Coefficient, it can be known that the Hypothesis 1, 2, 3, 4, 6, 7 and 9 passed the testing. However, the Hypotheses 5 and 8 are unacceptable as the values are more than 0.05 Alpha value. Moreover, the Hypotheses 1, 2, 3, 4, 6, 7 and 9 are proved to have a positive relationship with the dependent variables, while

the Hypotheses 5 and 8 do not have a positive relationship with Acceptance of OBA.

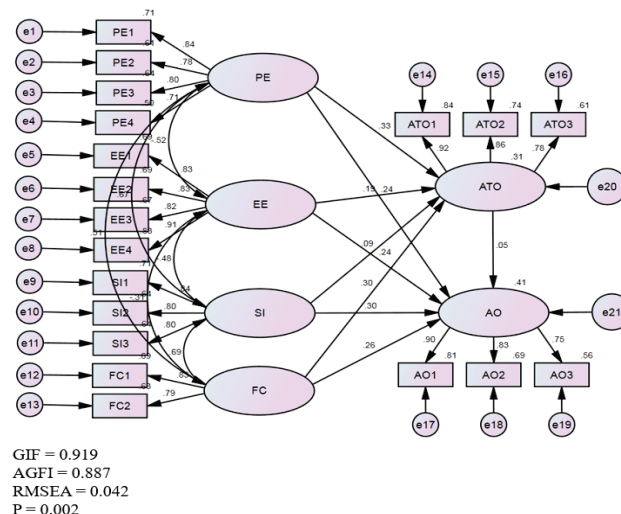


Figure 3 The Structural Model

Therefore, the conclusion is as follows:

H1: Performance expectancy has a positive relationship with consumer acceptance intention towards OBA.

H2: Effort expectancy has a positive relationship with consumer acceptance intention towards OBA.

H3: Social influence has a positive relationship with consumer acceptance intention towards OBA.

H4: Facilitating condition has a positive relationship with consumer acceptance intention towards OBA.

H5: Attitudes toward OBA do not have a positive impact on customer acceptance of OBA.

H6: Performance expectancy has a positive relationship with attitudes toward OBA.

H7: Effort expectancy has a positive relationship with attitudes toward OBA.

H8: Social influence does not have a positive relationship with attitudes toward OBA.

H9: Facilitating condition has a positive relationship with attitudes toward OBA.

Table 4 Hypothesis Test Results

Hypothesis	Estimate	S.E.	C.R.	P Value	Results
1	0.241	0.111	2.174	0.030	Support
2	0.158	0.054	2.912	0.004	Support
3	0.291	0.126	2.315	0.021	Support
4	0.224	0.099	2.274	0.023	Support
5	0.051	0.078	0.653	0.514	Not support
6	0.346	0.114	3.027	0.002	Support
7	0.128	0.056	2.303	0.021	Support
8	0.089	0.131	0.678	0.498	Not support
9	0.265	0.101	2.626	0.009	Support

5 DISCUSSIONS AND CONCLUSIONS

In terms of theoretical contributions, through the empirical study, this research built a theoretical model of investigating factors influencing consumer acceptance intention towards online behavioural advertising, which enriched the theories in the OBA field. Firstly, it is proven that four factors (PE, EE, SI, FC) positively influence consumer acceptance of OBA. Secondly, three factors (PE, EE, FC) also have a positive relationship with consumers'

attitudes toward OBA. However, the factor of SI does not positively impact consumers' attitudes toward OBA. This may attribute to the major research object in this paper. Chinese young university students are the millennials and generation Z who are born in the digital world and deeply influenced by western culture. As a result, they are more individualist and expect to engage in self-distinguished behaviours such as using unique products or services to express their personalities. Therefore, it is likely that their attitudes are less susceptible to the reference group. Thirdly, the study introduced ATO as a mediator of the model. However, a positive attitude towards OBA cannot lead to the implementation of using OBA to purchase products, which may be affected by privacy violation concerns. For example, an interviewee named Wang said that she knows OBA is convenient to acquire information she wants, but she still worries the private information will be disclosed once she clicks the ad. Although the result does not show a significant relationship between ATO and AO, it still has referential value in this field.

This paper also provides some management implications. Firstly, if users can acquire information about products or services they want from OBA, they are more willing to accept this form of advertising. In addition, if it is easy for customers to understand the content of OBA and procedures of buying products by using OBA, it is likely they will use it to complete their purchase behaviour. Then, opinions from users' family and friends as well as social trends will positively influence their acceptance intention towards OBA. Finally, technical support is also an important factor of influencing their acceptance intention. As a result, these four factors (PE, EE, SI, FC) can be adopted by marketers as significant predictors for assessing the acceptance degree of advertising. Nevertheless, the result shows that social influence does not positively influence consumers' attitudes toward OBA. As for the content of OBA, in order to catch up with social trends, marketers can combine hot spots of society in OBA, highlighting entertainment and storytelling to meet the user's psychological needs. With regard to the form of OBA, marketers can increase the interaction between advertisers and users to satisfy customers' personalized needs. For example, OBA can increase the barrage settings, so that users who are interested in the ad can express their opinions freely. In addition, the relationship between ATO and AO has not been proven. This phenomenon could attribute to the information privacy issues with the advent of personalized and customized ads. According to Li and Huang [34], privacy concerns among people have been proven to have a significant relationship with consumer negative experience, which further lead to advertising avoidance. As a result, marketers should try to avoid consumers' privacy information when they serve OBA. For example, users could be offered choices to decide whether to share their information online.

6 LIMITATIONS AND FUTURE IMPLICATIONS

There are still some limitations in this paper. With regard to sample selection, it can be expanded in the future as only young students are investigated. Further studies are expected to include more middle-aged consumers to compare the results with this study. In addition, as OBA is

a new form of advertising and it is closely connected to the Internet, it is important to know if the form and platform of ads can influence people's acceptance intention. Finally, conducting the study in a certain country could be a limitation as geographical differences could lead to different results. It should target to collect other countries' observations to test the research model in the future.

Although OBA helps marketers to contact their target audience in a more precise way, factors that influence customers' acceptance of OBA need to be paid attention to. People's concern about privacy issues online is still increasing. However, there are still ways for marketers to balance consumers' appreciation to OBA and annoyance of privacy violation. A recent study tried to understand norms about customer information that apply in the digital world. From collecting various ways in which Facebook and Google generate online ads based on customer personal data, consumers were asked the acceptable degree of each method and then the impact adherence to privacy norms on ads performance was investigated. The result shows that when the third party and unacceptable sharing occurred, the privacy concern could outweigh users' preference for OBA. The attitudes would in turn influence customers' purchase intention towards goods or services [35]. As a result, there are three ways that could help marketers to maximize the potential of OBA.

Firstly, be away from sensitive information of consumers, such as sexual orientation and health conditions. Secondly, enhance the transparency of data-use practice, which could foster trust between marketers and consumers. For example, consumers could be given the AdChoices icon to learn the reasons for seeing OBA. For consumers who are less sensitive to privacy, the icon would not be disruptive. Finally, provide useful information in OBA. Consumers are more willing to accept data collection when they can benefit from the ads. For example, the clothing retailer can recommend clothing pieces that suit consumers by collecting personal information including bra and weight size. As those recommendations are useful for customers, which would not irritate them. As a result, it is important for marketers to make better use of big data without "creeping" consumers.

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