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CONSUMERS' PURCHASE INTENTION ON CONSUMPTIVE MEDICAL PRODUCTS - A COMPARATIVE STUDY OF TAIWAN AND CHINA

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Abstract

The e-commerce business has been flourishing in Taiwan and China. However, while these two countries seem to have the same national culture, but in fact they are the laws and consumer cultures developed separately, which between them few comparative studies have been regarding the kind of complex consumption behaviors of consumers' purchasing intention on consumptive medical materials and devices on internet. This study developed a preliminary theoretical model to describe the key influencing factors on purchase intention of buying medical products online, which based on the perspective of perceived value and trust. A comparative analysis between Taiwan and China markets was performed by questionnaire research method in this study. The findings demonstrate that, (a) Contrary to China, both of the product involvement and the e-WOM have significantly influences on consumers' brand trust in Taiwan; (b) Neither to Taiwan and China, the product knowledge and the price consciousness do not significantly impact on the brand trust; (c) Either to Taiwan and China, the brand trust significantly impact on consumers'

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purchase intention; (d) Either to Taiwan and China, the e-WOM from the Internet, such as social media, tends to be readily adopted by consumers and indirectly impact on purchase decision significantly. Finally, this study points out the corresponding theoretical and managerial implications based on the data analysis results.

Keywords: Brand Trust, e-WOM, Perceived Value, Price Consciousness, Product Involvement

Introduction

The consumptive medical materials and devices is one of the industries with massive growth potential around the world. According to the national health expenditure account released by the Ministry of Health and Welfare of Taiwan (2019), the percentage of household expenditure used to purchase medical equipment had increased from 10% in 1996 to 14% in 2019, indicating that the usage of these products has gradually increased in daily life stably. Because of medical products were related with health care and life safety. For most consumers, medical products are belonging to complex consumption behaviors with low familiarity and low professionalism. Therefore, consumers will tend to a rational decision making of consideration by the transaction utility and the acquisition utility, that is, the perceived value (Thaler, 1985). In particular, Taiwanese small and medium enterprises leverage the Internet to strengthen the power of their brands and to expand the markets for their products in China. Nevertheless, in Taiwan and Mainland China, due to different legislation regarding medical products, the procedure and degree of difficulty for acquiring a license also differs for business. Indeed, it would be impact on consumers' trust and behavior furtherly.

Therefore, the major purpose of this study is to examine the differences of purchase intention of consumption medical products on e-commerce under the separate existent context of legislation environment in Taiwan and Mainland China, in order to construct the preliminary theoretical model, regarding the key influencing factors on purchase intention, and further exploring the cause of difference by survey research based on this study near future.

Literature Review and
Research Hypotheses

Perceived Value

Perceived value has a stable result for predicting consumers' purchasing behavior (Hellier et al., 2003). Gallarza, Saur and Holbrook (2011) proposed that Perceived value includes facility value and quality value, *i.e.* product involvement; professional value, *i.e.* product knowledge; price value, *i.e.* price consciousness; emotional value and social value, *i.e.* e-WOM. Customers' perceived value will positively and significantly affect their trust in businesses (Harris and Goode, 2004; Singh and Sirdeshmukh, 2000). By reducing transaction complexity and uncertainty, retailers can increase consumers' perceived value and then impact on trust (Badrinarayanan et al., 2014; Grabner and Kraeuter, 2002).

The Causal Relationship Between The Product Involvement And Brands Trust

Brand trust was defined that as the confidence of consumers toward brands, products, firms (Chaudhuri and Holbrook, 2001; Erdem and Swait, 2004). Product involvement was defined that when consumers have greater need for and more interest in a product, this product tends to be perceived with importance or living-related attributes (Peter and Olson, 1999). Because of consumers' product involvement comprises product understanding and searching efforts (Schiffman and Kanuk; 2000; Hahha and Wozniak, 2001), as well as possible shifts of consumers' physical and psychological needs during product involvement procedures (Blackwell et al., 2001), thus, consumers' brand trust of product could be built (Bian and Moutinho, 2011; Simpson, 2007). That is, due to the healthy relevancy by particular product attributes of consumptive medical materials and devices. Once consumers start getting highly involved in medical products, their brand trust will possibly be built. Therefore, this study proposes the causal hypothesis.

H1: the Product involvement has a positive and significant impact

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on the brand trust

The Causal Relationship Between The Product Knowledge And Brands Trust

Olson and Reynolds (1983) indicated that product knowledge describes customers' concrete perceptions of product attributes. When customers evaluate product value and make purchase decisions, product knowledge is an important igniting factor (Brucks, 1985). Customers who are less familiar with a product will be more motivated to undertake a deliberate search for information regarding the product and the brand of the product. The product knowledge gathering process reduces risk and increases trust in products and product brands (Conchar et al., 2004; Lee et al., 2011). Once their "internal information" is inadequate to reach a particular trust level, they tend to go further for external information. When customers understand more about product attributes, they tend to have more trust of target products, and they then tend to have clearer goals for their consuming decisions (Srinivasan, 1990). There-

fore, this study proposes the causal hypothesis.

H2: the Product knowledge has a positive and significant impact on the brand trust

The Causal Relationship Between The Price Consciousness And Brands Trust

When a price operates as a positive indicator, it may be observed as a positive factor playing as an evaluating process for products (Lichtenstein et al., 1993). This psychological phenomenon that significantly influences customers' reactions to the price information is called price consciousness: an individual trait that differentiates consumers based on the importance they give to price when evaluating or purchasing products (Hansen, 2013). Customers usually make purchase decisions by trust when they are willing to pay the charged price for the products of brand (Sproles and Kendall, 1986). In other word, a product tagged with a price will trigger customers' price consciousness associated with the brand trust,

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which is the essential indicators affecting customers' evaluation of brand value and trust (Ailawadi et al., 2003; Keller and Lehmann, 2003). Therefore, this study proposes the causal hypothesis.

H3: the Price consciousness has a positive and significant impact on the brand trust

The Causal Relationship Between The Electronic Word-Of-Mouth And Brands Trust

Westbrook (1987) defined that word-of-mouth as customers' evaluation and comments through informal channels after they have experienced products or services. The WOM can powerfully persuade, influence, and manipulate consumers' beliefs and behaviors (Bickart and Schindler, 2001). The e-WOM, shows the same effects as those of WOM but transmitted by internet (Gelb and Sundaram, 2002), which has become the vital product information indirectly for customers' purchase decisions. E-WOM has been seen as a kind of online recommendation system to earn the

customers' trust (Senecal and Nantel, 2004). Customers' perceived risk, inherent in online purchases, can be reduced through e-WOM (Tanimoto and Fujii, 2003); and enhanced the brand trust (Amblee and Bui, 2007). Therefore, this study proposes the causal hypothesis.

H4: the Electronic word-of-mouth has a positive and significant impact on the brands trust

The Causal Relationship Between The Brands Trust And Purchase Intention

Customer's intention to make a purchase is defined as the possibility of intention to buy a certain product or service (Zeithaml, 1988). When customers are attracted to some belief, the possibility of making a purchase tends to increase (Schiffman and Kanuk, 2005). Thus, customers' intention of buying those specifically brand products with trust tends to be higher than other brands' products (Dickson and Sawyer, 1990). The higher brand trust will results in higher purchase intention (Aaker and Shansby, 1982; Brucks, 1985).

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Therefore, this study proposes the causal hypothesis.

H5: the Brands trust has a positive and significant impact on the purchase intention

One Models But With Two Different Path Coefficients Of Signification

Wind and Mahajan (2001) stated that one method of introducing a new economy for companies is to develop a new business market. The online shopping in consumptive medical materials and devices opened in China and Taiwan in 2004 and 2012, respectively. Although people in Taiwan and China speak the same language and have almost the same culture, with different national conditions, market capacity, and design in retail channels. Therefore online businesses in these two countries will be pre-expected to develop same conceptual models but with two different path coefficients. To sum up, this study proposes the hypothesis.

H6: the Market of consumptive medical materials and devices in Taiwan and Mainland China will

be presented that same conceptual models but with two different path coefficients of signification

Theoretical Model

Based on the perceived value and trust, this study constructs a causal model on the purchase intention of medical products via e-commerce. It combines the purpose of this study, the results of the literature discussion and the derivation of hypotheses. The theoretical model is shown in Figure 1.

Methodology

Research Design and Questionnaire Development

A survey that requires a large number of subjects will use a pre-designed questionnaire. Compared with observation and other qualitative methods, the questionnaire survey method can collect quantitative data empirically and efficiently (Alvin and Ronald, 2009). In the questionnaire, the items of perceived value were obtained from the literature of Sanchez, Callarisa
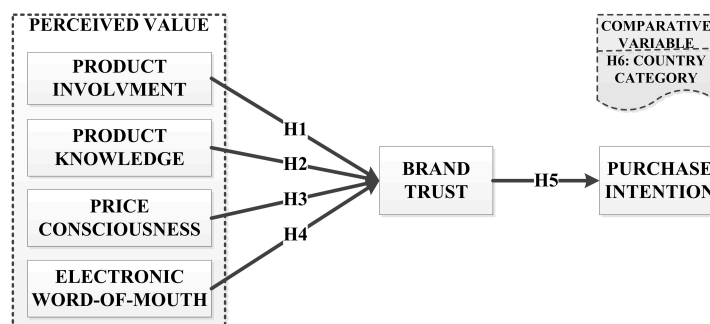
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Figure 1. Theoretical Model

and Rodriguez (2006). The e-WOM measure was drawn from a scale originally used by Ha (2004) and Amblee and Bui (2007). Finally, the items of purchase intention were based on Hsu, Chang, Chu and Lee (2014). Before administering the survey, the questionnaire was improved by experts in marketing and people who have experienced Internet shopping. Items in all scales were measured on a 7-point Likert scale, except for demographic characteristics.

Data Collection and Sample Characteristics

The survey was conducted between May 07, 2019, and June 20, 2019 by the online questionnaire survey websites for Taiwan and China. A total of 504 questionnaires were distributed and 411 valid samples were received (220 from Taiwan

and 191 from China). The response rate of valid was 81.55%. The sample predominantly consisted of female shoppers (87%); most were in the age group of 16-29 years; most earned an average income (35% of respondents earned approximately 30,000- 50,000 NT$ in Taiwan and 70% of respondents earned over 5000 CN¥ in China); and most had a college degree.

Data Analysis and Results

Measurement Model

The results were supported the convergent and discriminant validity of all scales, following the guidelines provided by Anderson and Gerbing (1988) and Fornell and Larcker (1981). In the 411 valid responses, Cronbach's α for the whole and for variables in the conceptual model were all higher than the

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cut-off point of 0.7, indicating that the measurement scales of the questionnaire reached construct reliability. The Composite Reliabilities, Average Variance Extracts, and Maximum Share Variances were all in conformity with the criteria

of construct reliability and validity according to the Confirmatory Factor Analysis in AMOS software. As shown in Table 1.

Table 1. Reliability and Convergent Validity Analysis

Research Construct	Observed Variable	Factor Loading (λ)>0.5 (Hair et al., 1992)	Composite Reliability (CR)>0.7 (Hair et al., 1998)	Average Variance Extracted (AVE)>0.5 (Fornell & Larcker, 1981)	Cronbach's Alpha>0.7 (Taber, 2017)	MSV < AVE (Hair et al., 2010)
PRODUCT INVOLVMENT	INV 1	0.834	0.935	0.782	0.907	0.280
	INV 2	0.899				
	INV 3	0.916				
e-WOM	e-WOM1	0.872	0.941	0.761	0.921	0.367
	e-WOM2	0.903				
	e-WOM3	0.911				
PRODUCT KNOWLEDGE	PK 1	0.902	0.959	0.827	0.948	0.212
	PK 2	0.922				
	PK 3	0.864				
	PK 4	0.936				
BRAND TRUST	TRU 1	0.839	0.945	0.776	0.927	0.222
	TRU 2	0.899				
	TRU 3	0.914				
PRICE CONSCIOUSNESS	PC 1	0.859	0.953	0.803	0.938	0.122
	PC 2	0.897				
	PC 3	0.912				
PURCHASE INTENTION	RI 1	0.902	0.957	0.818	0.944	0.367
	RI 2	0.937				
	RI 3	0.914				

The square root of each AVE related more strongly to itself than to others, confirming the diversity reliability of the questionnaire. As shown in Table 2.

Structural Model

The model fit indices show a well fitted model (As shown in Table 3).

As shown in Figure 2, all paths coefficient in the full-model were significantly except for H2 and H3. Additionally, to test the multi- mediating effect of brand trust, a bootstrapping method was used. The 95% confidence intervals of standardized indirect effects for brand trust mediating the causal relationship from the product involvement and the e-WOM to purchase intention were 0.227

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Table 2. Discriminate Validity Analysis

Construct	(1)	(2)	(3)	(4)	(5)	(6)
(1) PRODUCT INVOLVMENT	**0.707**					
(2) e-WOM	0.529	**0.740**				
(3) PRODUCT KNOWLEDGE	0.267	0.460	**0.711**			
(4) BRAND TRUST	0.449	0.471	0.239	**0.725**		
(5) PRICE CONSCIOUSNESS	0.106	0.349	0.217	0.210	**0.676**	
(6) PURCHASE INTENTION	0.520	0.606	0.353	0.354	0.335	**0.715**

NOTE:
1. The value of the diagonal elements (the part of shadow): AVE square root.
2. Off-diagonal elements: The correlations among the constructs.
3. Distinguish the discriminant validity: The value of the diagonal elements should be larger than the off-diagonal element.

Table 3. Model Fit Indices

Model fit index	Causal model	Multi-group model	Threshold
χ^2	516.318	769.587	smaller is better
$d.f.$	215	430	
$\chi^2/d.f.$	2.401	1.79	1~5
GFI	0.906	0.866	>0.8
AGFI	0.907	0.927	>0.9
RMR	0.058	0.063	smaller is better
SRMR	0.079	0.076	<0.08
RMSEA	0.058	0.044	<0.08
NFI	0.904	0.919	>0.9
CFI	0.916	0.909	>0.9

Table 4. INDIRECT EFFECT AND SIGNIFICANCE USING NORMAL DISTRIBUTION

	Value	s.e.	LL95CI	UL95CI	Z	Sig(two)
Effect	0.227	0.0461	0.3158	0.5202	8.5392	0.0000

Table 5. INDIRECT EFFECT AND SIGNIFICANCE USING NORMAL DISTRIBUTION

	Value	s.e.	LL95CI	UL95CI	Z	Sig(two)
Effect	0.245	0.0394	0.3729	0.5401	7.2685	0.0000

(p-value=0.000) and 0.245 (p-value=0.000) separately, which indicating that the partial mediating effects of brand trust were both significantly to them. As shown in Table 4, Table 5.The 95% confidence intervals of standardized indirect effects for brand trust mediating the causal relationship from the product knowledge and price consciousness to purchase intention were 0.115 (p-value=0.221) and 0.133 (p-value=0.362) separately, which indicating that the mediating effects of brand trust were both not significantly to them.
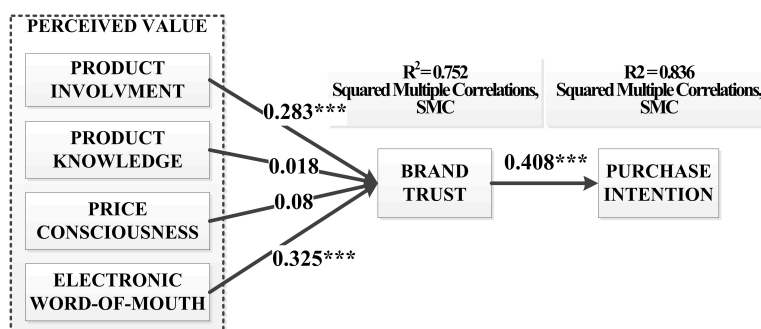
Figure 2. The Full-Model Path Analysis

Differences of samples with Taiwan and China were further tested using multi-group analysis. The path coefficients are listed in Table 6 separately. For China samples, the all paths coefficient were not significantly except for the relationship between the e-WOM and the brand trust; the brand trust and the pur- chase intention. Comparatively, Taiwanese consumers' brand trust tended to be built through the product involvement and the e-WOM. Taiwanese consumers' brand trust also impact on purchase intention significantly.

Table 6. Path Coefficients for Taiwan and China

Path	Taiwan	China
Product knowledge→Brand trust	-0.092(0.231)	0.081(0.748)
Product involvement→Brand trust	0.280**(0.012)	0.459(0.305)
Price consciousness→Brand trust	0.016(0.827)	0.228(0.154)
e-WOM→Brand trust	0.338**(0.004)	0.53*(0.031)
Brand trust→Purchase intention	0.426***(0.000)	0.347***(0.000)

Note: The figures in parentheses are t values.

To further examine consumer' difference of statistic in Taiwan and China in the conceptual model, a chi-square difference test was adopted (As shown in Table 7). The results revealed that consumers in Taiwan and China were significantly different.

Table 7. the Comparison of χ^2 Difference Testing on Taiwan and China Samples

Overall model	χ^2	d.f.	p-value
Unconstrained	342.217	166	
Fully constrained	377.400	180	
Difference	35.183	14	0.001

Discussion

Perceived value has all along as a generalized rational decision theory that effectively predicts purchase intentions (Parasuraman, Zeithaml and Berry, 1985; Porter, 1985). However, the consumptive medical products were presented huge different results of analysis on e-commerce in Taiwan and China in this study. The main reason for the unexpectedly different research results is due to the unique product attributes of consumptive medical products and the openness of the regulatory environment. In China, although the regulations are relatively loose, which is helpful to the rapid development of the consumer market, due to market characteristics, many fraudulent business activities such as false information of commodities have been derived, lack of the professionalism knowledge of medical products, even general products, high health risks have led to low price sensitivity, etc. For example, infant macrocephaly disease milk powder in 2003; fake vaccine in 2017, etc. Based on those illegal events above, compared with corporate propaganda, consumers may be more inclined to trust the In-

fluencers such as KOLs or Internet celebrities on internet. Therefore, for China, in the comparative model of this study, it seems reasonable and explainable why within perceived value there's only the e-WOM variable has a positive and significantly impact on brand trust. Contrarily, in Taiwan, the government in order to protect the rights and interests of consumers, the related legal rules are relatively strict. Thus, even though medical expertise is still insufficient for most consumers and the price sensitivity caused by product attributes is still low. However, based on the strictly requirements of laws and regulations, that the information of medical products must be fully disclosed to consumers. Therefore, in Taiwan, the comparison model was showed that the product involvement and the e-WOM both have a positive and significantly impact on brand trust. Finally, the brand trust has become a key mediation variable for purchase intention in the both comparison model.

Conclusion

For the Consumers

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The knowledge in medical is a specialized subject; which the relevant products information must be gained from specific reading materials including instructions, advertisements, or expert testimonials. The findings reveal that product involvement has been a common concern in Taiwan because consumers are capable of acquiring information through diverse approaches. Thus, the probability that Taiwanese consumers will blindly adopt product information from questionable origins on the Internet is lower. The results of this study which support a growing trend of research in the relationship between the product involvement, the brand trust and purchase intention (Aldwani and Palvia, 2000; Ranganathan and Ganapathy, 2002; Kim, et al. 2010). By contrast, for the majority of consumers in China, because of the information of medical products gathering methods are insufficient and lack of transparency. Therefore, based on the perspective of perceived value, for the consumers in China, most netizen's e-WOM has become the only one significantly source of factor in

brand trust.

For the Business

First, during the process of online shopping, brand trust was defined as consumers' beliefs and intention to become involved in an e-commerce, even given the possibility of loss, but based on the expectation that online shopping websites will engage in appropriate practices, i.e. they will still able to deliver the promised products or services (Lin et al., 2006). In the context of e-commerce, product involvement was included the assessment of the effects of web usage, particularly in product searches (Shih, 2004). That is, consumers' beliefs about product involvement may be assessed using consumers' perceptions of the quality of information found on online shopping websites. The website with high-quality product knowledge and a good interface design can induce consumers to trust it (Fung and Lee, 1999). Thus, if online shopping websites provide product knowledge by offering highly detailed information regarding completion, time, and

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accuracy to online consumers, the level of an online consumer's trust toward those online shopping websites can be enhanced. This comparison study of Taiwan and China was indicated that in Taiwan, product involvement is a long-term concern; the product information collected from centralized sources may be supplemented by the Internet. That is, the online shopping websites should provide useful and appropriate product knowledge or information with accuracy and timeliness to increase the level of brand trust that consumers feel toward their websites. Secondary, the e-WOM is a significantly and positively factor that either impact on brand trust directly, or purchase intention indirectly, for consumers both in Taiwan and China. Therefore, business must not only pay attention to the touchpoints in the sales stage of before, during, post for individual consumer, but also integrated the promotion strategy on social media, such as influencer marketing, *i.e.* the KOLs, Internet celebrities, etc. Finally, in terms of the development of the consumptive medical products industry in Mainland China, consumers are capable of

purchasing products from the Internet as long as the enterprise obtains the appropriate license easily by legal, which reflects the fact that the industry is flourishing constantly, with the current trends in China. However, the development of the medical products e-commerce sector of firm has been slowly in Taiwan; because of Taiwan currently has numerous legal restrictions on the medical commodities that may be sold online; thus the medical products e-commerce of Taiwan is remain stagnant. The expansion of medical products e-commerce in Taiwan will be restricted unless relevant enterprises are allowed to promote their products moderately without Taiwan's current inordinately strict limitations by legal.

Limitations and Future Directions

1. This study only revises the constructive questions developed by scholars through literature discussion. Perhaps through the process of qualitative research, we can further clarify whether there are differences in these measures or concepts, so as to put forward more valuable arguments.

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2. This article is a purely academic research, and only has limited and reasonable discussions based on the empirical data results presented by the preliminary model. Therefore, this article has absolutely no intention of accusing any country or market. The several preliminary results of this study still need to be explored by further research to demonstrate / explain, i.e. why couple of hypotheses were not be supported in this study in China.

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