



A Study on the Impact of Structural Equation-Based Time Orientation on Consumer Innovativeness in an e-commerce Environment

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Abstract. With the rise of e-commerce and online marketing as the main marketing tool, it is important to have a comprehensive understanding of what consumers think about new products as it not only speeds up the flow of products to companies, but also allows them to see more new products. New products are an important part of a company's revenue and also play an integral and important part in strategically positioning the company and competing in the marketplace. This paper investigates the impact of past, present and future orientations on consumer innovativeness using the amos structural equation from the perspective of consumers' temporal orientations. The final results show that the present orientation has a positive effect on consumer innovativeness, while the past and future orientations have a negative effect on consumer innovativeness. The paper concludes with marketing recommendations for new products.

Keywords: Online marketing · Time orientation · Consumer innovations

1 Introduction

“Tiktok” is a global app that has accumulated hundreds of millions of users around the world and has become one of the apps with the highest daily activity of users. With this high traffic, a different kind of e-commerce model has emerged from Taobao and Jingdong - live streaming with products. The convenient and efficient sales model has forced companies to speed up product updates and has also brought many new products to the general public.

New products play an important role in providing a company with a competitive advantage and earning profits, as well as helping to position the company strategically [1] Nielsen's report on Chinese consumers' 'newness' trends in 2019 shows that nearly 50% of consumers tend to try new things and actively seek out new brands or products. Indeed, as the Nielsen report suggests, companies need to introduce new products to the market to satisfy consumers' desire for new products in order to capture the market and increase their profits. But new product launches are not always quick enough to become a consumer favourite. The initial diffusion of a new product is generally caused by innovative consumers, who are the first to use the new product and who, through their

leadership role, make it more widely accepted by consumers. At the same time, time has been an important factor in the study of consumer behaviour topics, and there are several aspects to the appeal of this concept, which is often interpreted as an integral part of an individual's cognitive structure, influencing their attitudes and behaviour in many purchase situations.

Based on the above background, this paper constructs a structural equation model using three time orientations: past, present and future as the independent variables and consumer innovativeness as the dependent variable, and collects data through research literature and questionnaires to investigate the influence of time orientation on consumer innovativeness and concludes the paper with suggestions for companies to sell new products.

2 Research Framework

The theory of temporal perspective, originally proposed by Zimbardo et al. [2], argues that humans have different perceptions of temporal dimensions based on the organisation of different time frames and their personal and social experiences. These temporal dimensions are referred to as past, present and future. Individuals have a cognitive temporal bias towards the past, present or future, which in turn determines how one responds to decisions in life, while having an impact on consumer thinking and behavior [3]. Consumer innovativeness belongs to a specific domain or product category and is referred to as domain-specific innovativeness. Past research has identified the characteristics of domain-specific innovativeness as “reflecting the propensity to learn and adopt new products in a particular area of interest” [4].

3 Research Hypotheses and Models

The concept of time has always had an important place in consumer behaviour, as it conceptually influences various consumer behaviours, and therefore there is much research within the academic community on time and consumer behaviour. It is essential to understand innovative consumer behaviour before studying the purchasing behaviour of new products.

3.1 The Influence of Past Orientation on Consumer Innovativeness

Past orientations are consumers who have a nostalgic, sentimental attitude towards the past. This group of consumers is more tolerant of used products and refuses to use new products because they are more uncertain and therefore more risky to use.

Past orientations are characterised by self-control, risk aversion and a general tendency to buy familiar products. Past research [5] has shown that nostalgic women avoid new or unfamiliar leisure activities, preferring instead to do activities that they grew up familiar with. From another perspective, people with a past orientation find security in their habits and are therefore reluctant to try new things, preferring to recreate and relive the past by consuming familiar goods and services [6]. As consumer innovativeness involves changes in purchasing and consumption patterns and therefore involves risk, past-orientated consumers, who are less likely to change, exhibit lower levels of innovativeness.

3.2 The Impact of Present Orientation on Consumer Innovativeness

Now-oriented consumers are more focused on the present and less concerned with future consequences; they are more focused on the enjoyment of the present and are less inclined to focus on what things were like in the past or in the future [7].

Present-oriented consumers have a high need for stimulation and seek products, information and experiences that satisfy this need. They lack the self-control to postpone indulgences into the future and are unaware of the long-term implications of their actions [8]. Instead, they are more interested in stimulating current stimuli through consumption. Cotte et al. [5] found hedonistic and variety-seeking consumers, a time style who view time as something to be consumed or utilised in the pursuit of sensory pleasure and satisfaction. In terms of shopping behaviour, now-oriented consumers show a preference for novelty and a desire for variety. For example, they prefer novelty in groceries and look for a wide range of products and services.

3.3 The Impact of Future Orientation on Consumer Innovativeness

Future-oriented consumers prefer to link the choices they have in the immediate future to their future goals, and they think more about the impact that what they do now may have on the consequences in the future. They will make short-term sacrifices for the long-term benefits of the future.

Cotte et al. [5] identify 'time as a map' as a metaphor for the temporal style of those with a future time orientation. They found that future-oriented people are very engaged consumers who take the time to accumulate information, analyse choices and make well thought out decisions. From another perspective, future-oriented people may be interested in new products because innovation may help them achieve their goals. In summary, we propose the following hypothesis:

H1: Past orientation has a negative effect on consumer innovativeness.

H2: Present orientation has a positive effect on consumer innovativeness.

H3: Future orientation has a positive impact on consumer innovativeness.

4 Research Design and Data Analysis

In this study, the independent variables were past orientation, present orientation and future orientation, and the scale was based on the Time Orientation Scale designed by Zimbardo and Boyd[2]; the dependent variable was consumer innovativeness, and the scale was based on the study by Hurt (1977)[9]and others. The questionnaire was designed and printed out on paper and collected offline. 200 questionnaires were collected and 183 valid questionnaires were obtained after collation.

4.1 Results of Data Analysis

4.1.1 Reliability and Validity Analysis

The Cronbach's alpha coefficient was used to assess the reliability of the scale. The Cronbach's alpha coefficients of each latent variable ranged from 0.8296–0.8704, which

were all greater than the benchmark of 0.7; the combined reliability CR ranged from 0.830–0.837, which were all higher than the benchmark of 0.7; the squared difference Extraction (AVE) ranged from 0.6190–0.6912, all of which were above the benchmark of 0.5. This indicates that the measurement scales in this study are credible, see Table 1.

The validity of the discriminant was then tested by constructing a perfect correlation model at amos, as shown in Fig. 1. The square root of the latent variable AVE was compared to the correlation coefficient between the latent variables, as shown in Table 2. According to Table 2, the square root of the latent variable AVE was greater than the

Table 1. Reliability and validity analysis result

Latent variable	Observation item	Factor load	CR	AVE	α
past	T1	0.752	0.8379	0.6351	0.837
	T2	0.804			
	T3	0.829			
now	T4	0.837	0.8704	0.6912	0.837
	T5	0.821			
	T6	0.836			
future	T7	0.769	0.83	0.6198	0.830
	T8	0.76			
	T9	0.831			
innovations	C1	0.758	0.8296	0.6190	0.830
	C2	0.78			
	C3	0.821			

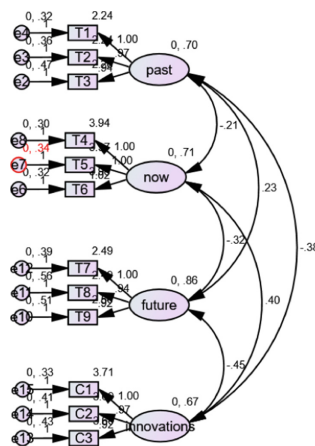


Fig. 1. Confirmatory factor analysis

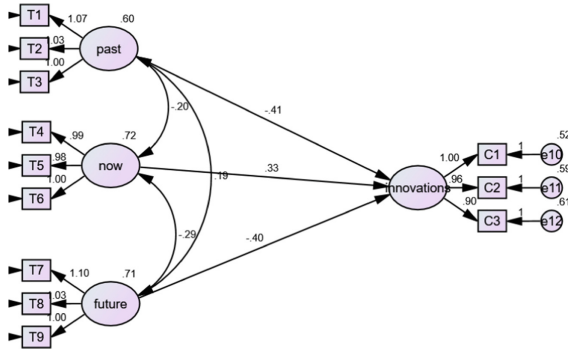


Fig. 2. Research model

correlation coefficient between the latent variables, indicating that the scale had good discriminant validity.

4.1.2 Structural Model Testing

This study used Amos 26.0 software to analyse the data from the research model as shown in Fig. 2 and the results are presented in Table 3. From the results in Table 3, it can be seen that both past orientation ($\beta = -0.457, p < 0.05$) and future orientation ($\beta = -0.484, p < 0.05$) negatively influenced consumer innovativeness. The present orientation ($\beta = 0.404, p < 0.05$) positively influences consumer innovativeness and is supported by H1, H2 and H3. The structural path coefficients for future orientation were larger and more significant relative to those for past orientation. This indicates that consumers with future orientation are more resistant to consumer use of new products relative to consumers with past orientation. Consumers with present orientation play more of a role in consumers’ use of new products versus those with future orientation. In addition, the structural validity tests in the model all met the criteria, indicating that the data fit well with the theoretical model.

Table 2. Discriminant validity analysis result

	PAST	NOW	FUTURE	INNOVATIONS
PAST	0.6351			
NOW	-0.2100	0.6912		
FUTURE	0.2300	-0.3180	0.6198	
INNOVATIONS	-0.3750	0.4000	-0.4510	0.6190
AVE SQUARE ROOT	0.7969	0.8314	0.7873	0.7868

Table 3. Path test of model

route	Unstandardized Coefficients	standardized Coefficients	S.E.	C.R.	hypothesis
past → inn	-0.409	-0.457	0.05	-8.159	support
now → inn	0.331	0.404	0.044	7.43	support
future → inn	-0.401	-0.484	0.049	-8.157	support

$X^2 / df = 1.237$, GFI = 0.904, IFI = 0.967, CFI = 0.976, RMSEA = 0.04

Note: ** indicates $P < 0.01$, * indicates $P < 0.05$

5 Conclusions and Recommendations

This paper investigates the impact of different temporal orientations on consumer innovativeness. The findings show that past and future orientations negatively affect consumer innovativeness, while present orientation positively affects consumer innovativeness. In other words, consumers with past and future time orientations are less likely to use new products than consumers with present time orientations.

There is no substitute for the role of new products in business, and this paper examines consumer innovativeness in order to better promote the marketing of new products in business. Time orientation is a personal characteristic of every consumer, and consumers can be segmented by their specific individual characteristics, which are often the primary variables that divide consumer groups. Consumers are influenced by a variety of factors such as age, gender, income, educational background, family size and lifestyle habits, and different consumer groups have different needs and desires. Time orientation affects the thinking process of consumers regarding decision-making, and different perceptions and understandings of time orientation are crucial for consumers.

As a modern enterprise, it is important to fully understand the psychological state of consumers to achieve accurate marketing. Consumers with a present orientation are more conservative, consumers with a future orientation will give up short term indulgence for long term benefits, only consumers with a present orientation are more focused on immediate enjoyment, so consumers with a present orientation are more willing to accept new products. Companies can use big data in online marketing to infer the time orientation of consumers based on their personal preferences, so as to recommend suitable products to consumers, such as recommending more classic and retro products to consumers with past orientation; recommending more fashionable and novel products to consumers with current orientation.

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