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**A STIMULUS-ORGANISM-RESPONSE MODEL TO STRUCTURE ALIPAY
CONSUMER PERCEPTIONS IN CHINA**

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ABSTRACT

Alipay is expanding all over the world in recent years. With the great brand image and customer value provided, Alipay has reached to top mobile payment service provider in the world. China is the major target market for Alipay. This study employs the theory of stimuli-organism-response (SOR), while adapts the theory of planned behavior (TPB) and technology of acceptance model (TAM) in conceptualizing the stimuli construct. The primary data collection approach is questionnaire-based survey, although the interviews provided some rich information which guided the operationalization process of the measurement instrument. The sample targeted the current consumers of Alipay services in China, of which 400 valid response were obtained. Based on multivariable statistical analysis such as multiple regression and structured equation modeling, the study confirms the validity of stimulus-organism-response (SOR) theory of consumer behavior and brand perceptions study, and together with the cross-comparative studies of the demographics and psychographic variables, some important strategic implications are offered which provide the market-oriented insights to Alipay as well as similar mobile-payments and services in China.

Keywords: Alipay, SOR Model, TPB, TAM, Brand Loyalty, Experience Sharing.

1. INTRODUCTION

Mobile payment platform is developing in a fast pace in the world. After the first and largest mobile payment provider, PayPal, there are many third-party payment platforms emerged to serve the customers. Alipay, as the biggest mobile payment platform in China, has taken over the majority part of mobile-payment market. The primary payment method in China now has switched from cash to Alipay-based system during the past few years. In recent years, Alipay is occupying a big portion of the Chinese market and is trying to extend their business aboard. However, the penetration rate of using mobile payment in many countries is still low (Guo and Bouwman 2016). Nevertheless, because Alipay is a new emerging platform in recent years, there are only few empirical studies analyzing Alipay context. It is still not known of an appropriate consumer behavior model to reflect the current states of perception on Alipay.

In view of the above background, the purpose of this study is to identify and assess the variables which can significantly and positively influence the perceptions of different facts of Alipay brand, i.e. brand image, brand trust, brand attitude, and customer value, on brand loyalty and experience



sharing. In a relatively unstudied consumer behaviors and brand perceptions context, Tan (2018a; 2018b) suggest the use of SOR model as a theoretical guide while use interviews for construct operationalization. In addition, together with the demographic and psychographic variable analysis, this study can provide valuable suggestions to Alipay and similar companies on areas of improvement and strategic focus, i.e. market penetration. For instance, Dahlberg et al. (2015) discussed four low-penetration factors: 1) consumer and merchant behavior, 2) a large number of competing technologies, 3) complexity of mobile payment and 4) lack of harmonized regulations. These factors, which exhibit the relevance of technology and complexity of factors in influencing consumer behaviors on mobile payment, underlie some of the fundamental inferences for TPB, TAM and SOR integrations found in the Literature Review section.

2. LITERATURE REVIW

This research aims to study the consumer behavior and the associated brand perceptions structure that pertain to the use of Alipay mobile payment and some of the creative services found in the Alipay service systems. The results of this study can offer Alipay and other similar service organizations the product-market penetration strategies that can effectively produce the intended benefits.

SOR theory and model was proposed as an engaging process for customers toward a product (Lichtenstein et al. 1988; Tan, 2018a; 2018b). TPB is used to analyze people's intention and behavior (Ajzen 2002), while TAM indicates how users come to accept technology (Davis et al. 1989). While SOR is used as the base of the conceptual integration, TPB and TAM are exploited for stimulation assessments. Specifically, TPB considers attitude, subjective norm, and perceived behavioral control (PBC), as significant factors stimulating the intentions of consumers (Fitzsimmons and Douglas 2011). TAM is considered for Alipay's mobile payment as the services are predominantly technology-rich in applications. The perceived usefulness (PU) and perceived ease of use (PEOU) are the two important TAM-stimuli which are adapted in the SOR model as important stimulating factors influencing consumers' intention for continuation. Product and service is another variable which influences consumers to create organism concept in their mind (Tan, 2018a). The intention of using a product will be affected by quality and attractive product design and well services performed (Herrmann et al. 1997). With proper stimulations, customers will form positive brand perceptions and the values of the product and services. The SOR thus is an integrative base for TPB and TAM, and the conceptual framework show in Figure 1 would be empirically validated by means of structural equation modeling (SEM) analysis.

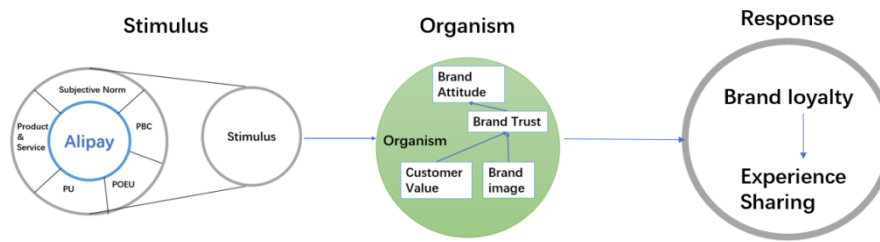


Figure 1: The conceptual model.

In Figure1, four organism factors are considered, namely brand attitude, brand trust, brand image and customer value. High level of brand attitude is a result of brand-related experiences, and it has shown to have the ability to influence the continuance of using a product (Mishra 2014). Besides, when consumers form favorable perceptions towards the brand, reflected, for instance in brand image, customer value and brand images, brand loyalty is developed (Tan, 2018a). In a similar count, Zhou (2014) shows that brand trust will make consumers believe that the brand is worthful to share and use. The more value customer gains, the higher the level of brand loyalty is (Almquist et al. 2016). Likewise, brand image can help customers develop a further connection with the company (Deng, 2015). On the response aspect of the SOR model, customer's brand loyalty will be improved with better result from organism, which further induces sharing of experiences (Gefen et al. 2003). As the current experience sharing process is straightforward and efficient, partly contributable to social media being able to deliver messages immediately, it can create a sufficient channel to Alipay on developing further penetration with new customers, through brand community engagement (Tan, 2018b). Besides the TAM and TPB-enabled SOR model, the sharing role is another domain of contribution of this study.

3. RESEARCH METHODOLOGY

Both interviews and questionnaire-based survey are used sequentially. While interviews provide some grounded overviews of concepts and key variables involved, the questionnaire-based survey is typically efficient and effective in assessing the validity of a theoretical model. Nevertheless, literature reviews are needed prior to questionnaire items design and survey. The step-configuration of this study is started with the research objective which employed the deductive approach to conceptualize the SOR model for guiding the operationalization of measurement instruments and to provide a structure of logics for data analysis, discussions and implications. SEM (structural equation modeling) and multiple-regression analyses would be the main statistical tools applied to provide the evidences to support the validity of the SOR model, but prior to that, correlations assessment, reliability and validity examinations of the constructs would need to be established.



4. DATA ANALYSIS

a. General data analysis, ANOVA and t-tests

Data were collected from 433 current Alipay users. Among them, 33 samples were not answered by following the rules; thus, there are 400 valid answer sheets were used to analyze the data. Table 1 shows the general data, ANOVA, and t-test analysis. Noticeable, male and female Alipay users are giving similar answers to each variable question, and the scores are relatively high among genders. In the age segments, elder people reflect lower levers of perceptual agreements with all the SOR variables, indicating that Alipay should pay more attention to elders, especially focusing on higher level of perceived ease of use and more customer value. Most of occupations evaluate Alipay highly. Shown in Table 1 is the 100% of responders saying that they know people who use Alipay around them which could infer popularity and externality advantages of Alipay as a brand. The customer value is evaluated a little bit lower than other categories, which addresses that Alipay needs to provide more valuable functions to customers. For users who use Alipay in a low frequency level, their feedback show lower levels of the SOR factors perceptions. As the usage frequency improves, the grades they give increase relatively, especially for perceived behavioral control and brand image, indicating they are in a better position to effectively use Alipay services. Thus, Alipay should consider developing strategies on improving customers' using frequency, as it would have systemic impacts on the SOR behaviors and attitudes, consistent with the finding of smartphone usages in Thailand as discussed in Tan (2018b). Shown in Table 1 also reflects an urgent need for Alipay to pay attention for the lower-income groups as they are significantly different from the other income groups with lower perceptual values on all the SOR model factors.

Table 1: General data analysis, ANOVA and t-tests.

Description	Frequency	Percentage	STIMULUS					ORGANISM				RESPONSE	
			Subjective Norm	Perceived Behavior Control	Perceived Usefulness	Perceived Ease of Use	Product and Service	Brand Attitude	Brand Trust	Brand Image	Customer Value	Brand Loyalty	Experience Sharing
Mean			4.05	4.15	4.05	4.08	4.04	4.13	4.07	4.15	3.99	4.07	4.05
Stdv.			0.63	0.54	0.69	0.56	0.6	0.61	0.63	0.56	0.61	0.63	0.64
Gender													
Male	157	39.3	4.09	4.10	4.04	4.10	4.02	4.11	4.08	4.17	4.04	4.10	4.08
Female	243	60.8	4.03	4.18	4.05	4.07	4.05	4.15	4.06	4.14	3.96	4.05	4.03
Age													
Under18	37	9.3	4.11	4.13	4.04	4.10	4.13	4.13	4.12	4.17	4.08	4.13	4.11
18-37	250	62.5	4.04	4.14	3.99	4.03	3.97	4.08	4.01	4.10	3.91	4.02	3.99
38-57	105	26.3	4.07	4.22	4.19	4.19	4.14	4.25	4.20	4.26	4.14	4.15	4.14
Above 57	8	2	4.00	3.79	3.81	3.78	3.91	3.91	4.08	4.05	3.95	4.07	4.06
Occupation													
Student	124	31	4.05	4.14	4.05	4.13	4.08	4.14	4.02	4.18	3.92	4.08	4.08
Merchant	20	5	4.14	4.13	4.25	4.12	4.27	4.25	4.25	4.13	4.24	4.20	4.10
Office worker	77	19.3	4.16	4.06	4.06	4.07	3.95	4.06	4.04	4.18	4.01	4.03	4.05
Business man	41	10.3	4.25	4.15	4.09	4.07	4.07	4.12	4.18	4.19	4.15	4.14	4.12
Other	138	34.5	3.91	4.20	3.98	4.03	3.98	4.13	4.06	4.08	3.95	4.03	3.97
Know other Alipay users													
Yes	400	100	4.05	4.14	4.04	4.08	4.15	4.03	4.13	4.06	3.99	4.06	4.04
No	0	0											
Alipay using frequency													
Rare	4	1	3.74	3.33	3.50	3.81	3.18	3.37	3.25	3.60	3.14	3.10	3.27
Occasionally	8	2	4.25	4.12	4.03	4.09	4.09	4.03	4.65	4.20	4.06	4.30	4.21
Often	123	30.8	3.91	4.02	3.83	4.01	3.98	4.06	3.92	4.03	3.87	3.93	3.91
Usually	198	49.5	4.09	4.19	4.14	4.11	4.04	4.17	4.14	4.18	4.07	4.12	4.09
Always	67	16.8	4.16	4.27	4.18	4.11	4.14	4.17	4.14	4.27	3.98	4.17	4.18
Education													
High school	45	11.3	4.07	4.16	4.05	4.10	4.14	4.17	4.20	4.18	4.11	4.14	4.10
University	281	70.3	4.05	4.16	4.04	4.09	4.03	4.13	4.04	4.16	3.96	4.07	4.05
Other	74	18.5	4.04	4.07	4.06	4.02	3.98	4.08	4.07	4.08	4.00	4.00	3.98
Monthly income													
Below 3,000	107	26.8	3.98	4.09	3.97	4.07	4.04	4.12	3.98	4.10	3.89	4.02	4.00
3,000-10,000	145	36.3	4.05	4.16	4.05	4.09	3.98	4.15	4.08	4.16	4.01	4.04	4.02
Above 10,000	148	37	4.09	4.16	4.09	4.07	4.06	4.10	4.12	4.16	4.03	4.11	4.10
To what extend on using Alipay													
Small number of portion	138	34.5	3.92	4.07	3.93	4.05	4.01	4.12	4.04	4.17	3.92	4.00	4.01
Nearly half	207	51.8	4.11	4.15	4.07	4.07	4.01	4.10	4.04	4.08	4.00	4.07	4.02
Most of them	55	13.8	4.13	4.33	4.23	4.17	4.15	4.20	4.21	4.32	4.08	4.20	4.20



b. Construct quality assessments and structural equation modeling (SEM) analysis

All the constructs were tested the Cronbach’s alpha. Noticed that subjective norm results in a low reliability which is less than 0.7, while other variables are all above 0.7. Thus, subjective norm is not been used in the inferential statistical analysis i.e. SEM. Table 2 is the reliability test of Alipay variables, as well as the evidence showing both convergent and divergent validity meeting the criteria. Specifically, the diagonal shows the square-root of the total variance explained (TVE, which is obtained from data reduction) exceeding the cross-correlation coefficients, and together with TVE > 0.5, reliability index > 0.7 (except subjective norm), the convergent and discriminant validity of the constructs are met.

Table 2: Reliability, convergent and discriminant analyses

	V1	V2	V3	V4	V5	V6	V7	V8	V9	V10	V11	TVE	Reliability Index
V1	0.723623											0.52363	0.53
V2	0.305	0.793398										0.62948	0.703
V3	0.402	0.685	0.84947									0.7216	0.87
V4	0.339	0.607	0.72	0.792098								0.62742	0.801
V5	0.442	0.636	0.707	0.689	0.860488							0.74044	0.883
V6	0.474	0.647	0.664	0.634	0.738	0.7824						0.61215	0.84
V7	0.327	0.606	0.691	0.58	0.664	0.795	0.858964					0.73782	0.88
V8	0.414	0.604	0.7	0.58	0.652	0.791	0.759	0.872559				0.76136	0.841
V9	0.473	0.626	0.71	0.606	0.636	0.746	0.687	0.828	0.814021			0.66263	0.924
V10	0.555	0.663	0.735	0.631	0.731	0.739	0.659	0.8	0.796	0.813757		0.6622	0.869
V11	0.465	0.625	0.724	0.6	0.731	0.643	0.671	0.698	0.715	0.854	0.858903	0.73257	0.877

Note: V1 = Subjective norm, V2 = Perceived behavioral control, V3 = Perceived usefulness, V4 = Perceived ease of use, V5 = Product and service, V6 = Brand image, V7 = Brand attitude, V8 = Brand trust, V9 = Customer value, V10 = Brand loyalty, V11 = Experience sharing.

Moreover, the data have been tested based on structural equation modeling (SEM), following the criteria for instance, guided in Wiratchai (1999). The SEM path structure is shown in Figure 2, evidencing an excellent fit, evidenced by RMSEA (Root mean square error of approximation) = 0.051, CFI (Comparative fit index) = 0.998, TLI (Tucker lewis index) = 0.989, IFI (Incremental fit index) = 0.998, RFI (Ratio frequency interference) = 0.949, NFI (Normed-fit index) = 0.989, GFI (Goodness of fit) = 0.979. Noticed from Hair et al. (2006), RMSEA is in good fit when the value is less than 0.08. Moreover, other incremental and absolute fit indexes such as CFI, TLI, IFI, RFI, NFI, and GFI demonstrate good fits near 1 value. Specifically, the greater brand trust and brand image, including the perceived values of Alipay products and services by the customers, was shown associated with a higher likelihood of brand loyalty in Figure 2. The following regression equations can be derived from the SEM structure, which supports the validity of the SOR model. The terminologies used are: PS=product and service, PU=perceived usefulness, PEOU=perceived ease of use, BI=brand image, BT=brand trust, BA=brand attitude, CV=customer value, BL=brand loyalty, and ES=experience sharing. While equations 1-4 identify and support a S → O structure, equations 5-6 support the O → R structure.

$$BI (0.65 \text{ R-squared}) = 0.41PS + 0.26PU + 0.16PEOU$$

(1)

$$BT (0.76 \text{ R-squared}) = 0.36PS + 0.24PU + 0.01BI$$

(2)



$$BA (0.70 \text{ R-squared}) = 0.27BT + 0.26PS + 0.23PU$$

(3)

$$CV (0.64 \text{ R-squared}) = 0.48PS + 0.36PU + 0.04PEOU$$

(4)

$$BL (0.75\text{R-squared}) = 0.32BI + 0.35BT + 0.33CV$$

(5)

$$ES (0.76\text{R-squared}) = 0.35BI + 0.65BL + 0.1CV$$

(6)

It is obvious that experience sharing, which has 0.76 R-square, is influenced by brand loyalty significantly, with the standard regression coefficient at 0.65. The result achieves the research objective underpinning SOR as a useful consumer behavior model for Alipay, which is consistent with the works of Tan (2017; 2018a; 2018b).

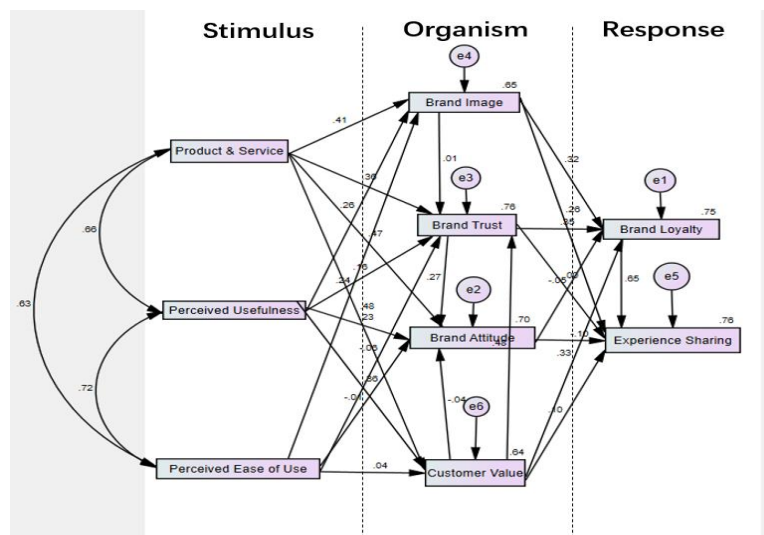


Figure 2: SEM analysis.

5. CONCLUSION

The study fulfils the research objective which is evidenced by the validity of the SOR (Stimulus-Organism-Response) model. The action-driven response that Alipay needs for increasing penetration is experience sharing. The SEM result shows that to accomplish higher level of sharing, such as via social media, brand loyalty is the key. Besides brand loyalty, brand image, brand trust and brand attitude, and customer value are important mediating factors known as organism in the SOR structure. The SEM outcome also implies that Alipay should put more attention on stimulating customers by focusing on product and service, and TAM variables. Customer's brand image concept will facilitate brand trust and eventually change brand attitude, which lead to brand loyalty. The SOR model also shows that customers who are loyal tend to share their experiences, such as on social media, which directly or indirectly would help Alipay provide a useful platform for market penetrations. This finding is consistent with the work of Tan and Patthracholakorn (2018) on



concept of brand community engagement. In addition, the lower-income users should be managed with special promotional mix or campaigns in order to arouse their interests and develop better perceptions on Alipay products and services. Campaigning to stimulate the continuous usages of the Alipay services also can help improve the overall perceptual attitudes and should be promoted.

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