

FACTORS INFLUENCING CROSS-SCREEN ENGAGEMENT IN YOUNG CHINESE USERS

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ABSTRACT

Cross-screen engagement has evolved as an important consumer phenomenon and its rapidly increasing in terms of frequency and opportunities it offers. This phenomenon is also coined as 'multi-screening' which is defined as the simultaneous or sequential use of more than one screen to perform related or unrelated tasks. Multi-screening has a wide range of implications and it opens doors for various research opportunities. However, there is a lack of research in this context and our understanding of user's adoption of multi-screening is not advocate since past research has focused on adoption behavior in a single device context. The young generation of China is tech savvy and they are the most frequent user of technological devices and gadgets in the world, therefore they are also considered trendsetters for other markets. This study is devoted to exploring multi-screening adoption in young Chinese. Survey method has been chosen for collecting primary data and a sample size of 262 was utilized for the analysis which employed PLS-SEM technique through SmartPLS 3.0. The findings revealed that autonomy, outcome expectancy and self-efficacy are successful predictors of multi-screening behavior whereas, self-image could not exhibit significant impact on the multi-screening phenomenon. Research implications are provided in the end.

Keywords: Autonomy; Chinese Young Consumers; Consumer Behaviour; Cross-Screen Engagement; Multi-Screening; Technology Adoption.

1. INTRODUCTION

In the contemporary environment, daily life is dominated by multiple screens such as smartphones, laptops, desktops, tables among others. Google (2012) defined 'multi-screening' as the use of the second screen or

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more than one screens for related work sequentially or for related and unrelated work simultaneously. The rapidly evolving multi-screen phenomenon has opened doors to several research opportunities in a wide range of disciplines since it has direct or indirect implications in a number of fields. It has a huge impact on marketing world. Understanding and tracking user's behavior among different devices is one of the greatest challenges for digital marketers (Cesar, Knoche & Bulterman, 2009). Media is yet another industry widely influenced by multi-screens since 90% of people's media interactions are screen based these days (Google, 2012). People are increasingly using multiple devices to satisfy their media viewing needs. Furthermore, consumer purchase path is evolving because of the upsurge in use of multi-screens in shopping activities. Online shopping trends are changing due to the increased penetration of multiple screens in everyday life. In a recent survey conducted across China by Google along with other partners, interesting multi-screening trends of Chinese people were revealed. Television, computers (desktop, PC) are most frequently used devices. Smartphone, computers, and tablets are more popular among young generation as compared to general population. Chinese youth are more inclined towards using multiple devices compared to general population. People are using their multiple screens in combination to accomplish their daily activities, such as searching for info, watching vidoes and shopping online. Majority of them engage into cross device interactions and they are no more dependent on only one device (Consumer Barometer, 2016). Young generation of China is not only tech-savvy but also they have the huge potential and contribution into consumer and business markets. Therefore, it is very important to understand the multi-screening behavior of Chinese young generation.

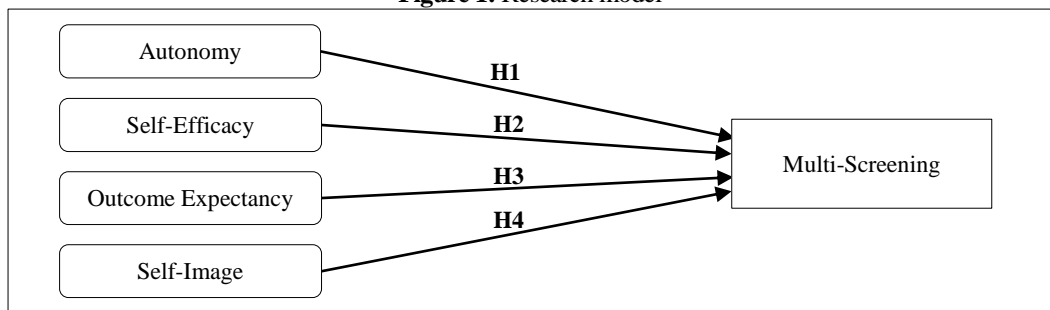
In past user-device interactions have been viewed in a single device context and research has provided valuable insights into this area, but only limited to user-device interactions with a single device (Liao & Deng, 2014). However in the new century, our interactions with modern technology have grown tighter and the role of technology in people's life has evolved from facilitating, dominating and influencing to the level where it can change the perceptual and cognitive aspects of human mind (Sarker & Wells, 2003). As consequence of enhanced interactive experiences, user behaviors have increased in complexity, the impact of technology has become versatile and there is a greater need of reassessment in order to understand the interplay between users and their multi-screens (Liao & Deng, 2014). Marketing professionals now believe that the device itself is not so important, what matters more is human nature and people's motivations driving their interactions with multiple screens. Since in today's constantly connected world, the average person uses multiple devices, so the device itself does not tell much about the person using it (eMarketer, 2015). We explicitly need to explore user's motivations behind the adoption of multi-screening, which is the focus of the current study. Based on previous literature of technology adoption we selected key motivational factors to establish determinants of multi-screening behavior namely: autonomy, self-image, outcome expectancy and self-efficacy.

2. THEORETICAL FRAMEWORK

In past literature, autonomy, self-efficacy, outcome expectancy and self-image have been discussed as individual motivations for the adoption of computer-mediated technology. Literature in technology adoption domain reported significant association between technology adoption and these factors. Self-determination theory is a key theory of motivation and it suggests that the quality of individuals' motivation determines the extent to which people will involve into, and continue with behavior (Deci & Ryan, 1987). Self-determination theory has been contributing to research in social sciences since long and its implications are enormous even in today's world. More closely to current context, Koo et al. (2015) derived motivational constructs from self-determination theory and social influence to determine the antecedents of green IT device adoption. The theory stresses the importance of autonomy, self-efficacy, and relatedness

as the important motivations for human behavior and attitude. Self-image is a social construct and derived from relatedness and social norms. Social cognitive theory recognizes the instrumental role of self-efficacy and outcome expectancy in the development of human behavior (Bandura, 1997). Social cognitive theory is being widely implemented in contemporary research of technology adoption through its central construct of self-efficacy. While elaborating technology adoption phenomenon, enormous studies have employed constructs of self-efficacy and outcome expectancy which are two major pillars of social cognitive theory. Some researchers have constructed their investigations solely on the basis of social cognitive theory. Boateng et al. (2016) assessed internet banking adoption with perspective of social cognitive theory. By using social cognitive theory, Lowry et al. (2017) performed a meta-analysis of the factors which can maximize prediction of digital piracy. Figure 1 represents the theoretical model of the current study. The individual constructs and related hypotheses are described below.

Figure 1: Research model



2.1. *Autonomy*

Autonomy can be defined as assuming a sense of agency, inclusion of the decision making capacity, assisting in the development of a personal identity, exercising control over critical areas of one's life (Moshman, 2005; Nucci, 2001). Therefore, an autonomous individual is the one who holds freedom, independent capacity and desire to choose and carry out the options that he/she really prefers (Horn, 1996). Boredom is linked with the lack of autonomy because in the absence of autonomous regulation people are unable to locate and internalize the value of a task (Tze et al., 2014). Actions lose their appeal when reasons to perform them move from autonomous to control. Autonomous behaviour is considered to be self-determined and the one engaging in such behaviour feels a sense of choice, enjoyment, interest, satisfaction and personal endorsement (Hagger et al., 2014). Autonomy has been proven instrumental in consumer behavior domain (Baumeister et al., 2008). Attainment of autonomy has been determined as a key consumer objective in technology adoption (Pikkarainen et al., 2004). Kononova and Chiang (2015) termed autonomy as being able to control the media use, having the power to decide which media and to what extent to use in a multi-screening context. They described that multi-screening individuals feel sense of autonomy when switching among different devices simultaneously. Hence we can assume that:

H1: Autonomy will be positively associated with multi-screening.

2.2. *Self-efficacy*

Self-efficacy correspond to the competencies; knowing about the world and knowing how to do in the world. Individuals' capabilities about the quantity and quality of behavioral enactments and cognitive constructions are known as competencies. Competencies also include people's ability to generate diverse

behaviors within particular situations and constraints (Mischel 1973, p. 266). Self-efficacy consists of individuals' beliefs about their abilities and competencies under particular situations and within specific domains (Mischel & Ayduk, 2004; Cervone et al., 2004). It is a contextual aspect of human behavior and cannot be generalized to all situations without limitations of a specific context, it only refers to our ideas about what we can do in certain situations using our related capabilities (Maddux & Volkmann 2011, p. 316).

The stronger one's self-efficacy in particular domain, the higher will be the goals which one sets for oneself in that specific domain (Bandura, 1997). Overestimates of personal abilities motivate the accomplishment of challenging and lofty goals (Taylor & Brown, 1988) which later become their self-fulfilling predictions when people set their visions high, persist and then later surpass their previous attainment levels (Maddux & Volkmann 2011, p. 316). Individuals more often tend to work on plans they think they can implement competently as compared to the plans they believe are beyond their capabilities. Self-efficacy has been extensively used in adoption of technology, mobile and stationary devices and it has been proved repeatedly that having competence of performing a specific behavior further increases its adoption level. It can be hypothesized that:

H2: Self-efficacy will be positively associated with multi-screening.

2.3. Self-image

People actively evaluate themselves and expect to be judged by others. They strive to prove their qualities and present their preferred characteristics to ensure their significance in their own eyes and in the eyes of others (Dickerson & Kemeny, 2004). They do not passively wait for others to accept and admire their desired qualities instead they are active in the generation of preferred self-view so that others should see their desired images (Schlenker, 2003). Previous research has concluded that desire to attain social status, prestige and recognition is a powerful and one of the main motivational factors for adoption of new technology (Solomon et al., 2013). For example, many people show interest in adopting new mobile-based services beyond functional or utilitarian reasons, and mostly for the sake of creating the desirable social image (Teo and Pok, 2003). In the context of the current study, self-image can be expressed as motivation to adopt the use of multi-screens in order to shape a positive self-image in society. So, we can postulate;

H3: Self-image will be positively associated with multi-screening.

2.4. Outcome Expectancy

Individuals' expectation of the desired outcome from performing a task is known as outcome expectancy. So, outcome expectancy refers to the consequence of the task and not to the task itself. People usually chose a behavior thoughtfully and they would consider what outcomes they will get when deciding on a course of an action (Williams, 2010). People construct outcome expectations from observed conditional relations between environmental events in the world around them, and the outcomes that given actions produce. The ability of bringing anticipated outcomes to bear on current activities promotes mindful behavior. It enables people to transcend the dictates of their immediate environment and to shape the present to fit in a desired future.

Outcome expectancy is utility oriented construct and also a strong indicator of people's adoption of a particular behavior (Venkatesh et al., 2003). While utility consists of outcome expectations of wisdom, value, and usefulness (Batra & Ahtola, 1991). Past research has reported outcome expectancy as a key

indicator of technology adoption (e.g., Ho, Chou, & O'Neill, 2010). Oliveira et al. (2016) reported the impact of outcome expectancy in the adoption of portable screens for online payments. Gilbert and Han (2005) found that outcome expectancy is linked with the adoption of mobile cloud services. Wong et al. (2016) stated outcome expectancy as adoption intension of mobile TV. Venkatesh et al. (2012) integrated factors from expectancy value theory to explain consumer acceptance and use of information technology. Thus it can be assumed that:

H4: Outcome expectancy will be positively associated with multi-screening.

3. METHODOLOGY

The current research is using the paper questionnaire as the measurement instrument. Whereas, convenience and purposive sampling method has been used for primary data collection.

3.1. *Instrument Development*

The scales for all independent variables have been adapted from past research. However, modifications have been made with respect to the context of the study. The scale for autonomy constitutes 5 items adapted from past research (Bieling et al., 2000). Self-efficacy consists of 5 items (Hsu & Chiu, 2004) and outcome expectancy have also been measured through 5 item scale adapted from the previous studies (Eveleth & Stone, 2008). Self-image is measured through 4 item scale (Yang & Lester, 2005). Dependent variable multi-screening has been evaluated through a self-developed scale comprising of 6 items. All the items other than control variables have been measured on a LIKERT scale (1-5) ranging from strongly disagree to strongly agree. Since the survey has also used a self-developed scale, authors took good care of the validity of the instrument in developing the questionnaire in addition to the statistical evaluation of the reliability and validity issues. Preceding data collection, the instrument was judged based on the face validity and pre-testing. Face validity of the instrument was established by taking professional advice from a panel of experts and content validity is evaluated by pretesting. Pilot test has been conducted with a pilot sample of 35 university students. Respondents of the pilot test were requested to provide feedback and suggestions for improvement. Respondents successfully answered all questions with help of the given instructions and they provided some valuable feedback/suggestions. The detail of the measurement instrument is given in Appendix.

3.2. *Sampling and Survey Administration*

Convenience sampling (non-probability) technique was used for primary data collection. This sampling method is suitable when prior knowledge about the studied behavior is not sufficiently available (Barclay et al., 1995). Furthermore, it is also suitable when shared characteristics of the population are required such as in the present scenario multiple screen usage.

Since everyone may not be the multi-screen user so, the prequalification of the respondents was done by asking them if they have multiple screens in possession and if they usually use more than one devices. Only the respondents who answered affirmatory to these initial questions were asked to continue with rest of the questionnaire. So, the respondents of the study have some level of multi-screening experience. Participation in this survey was on the volunteer basis. A total of 277 responses received while 15 incomplete responses were removed and 262 complete responses were subjected to the final analysis. Most respondents are young (between 18 to 29 years). Out of 262 effective sample, 57 % are male and 43 % are

female. Their education level varies since 37 % are undergraduate students, 43% are graduate/master students and 19% are P.h.D students. Table 1 shows the sample profile.

Table 1: Sample description

Characteristics	Category	Frequency	Percentage
Gender	Male	149	57
	Female	113	43
Age	18-23 year	102	39
	24-29	113	43
	30-35	38	13
Education	Undergraduate/ Bachelors	98	37
	Graduate/Masters	113	43
	PhD	51	19
Income	Low Income		
	Middle Income		
	High Income		

4. ANALYSIS AND RESULTS

Data was analyzed through structural equation modeling by using partial least square (PLS) approach. SmartPLS 3.0 statistical package has been utilized for the aforementioned analysis. Since our research model include both formative and reflective variables and PLS readily accommodates both formative and reflective constructs (Hair, Ringle, Hult, & Sarstedt, 2013; Hair et al., 2011). Moreover, this method has the lesser restrictive assumption about the data, such as normal distribution is not required because it applies bootstrapping to calculate the standard error for the parameter estimations (Henseler, Ringle, & Sarstedt, 2012). So, there was no need to check the normality of data in this case.

The analysis of the research model in PLS-SEM is done in two steps. Firstly measurement (outer) model is assessed that deals with the evaluation of the properties of the constructs and their respective measurement items. In the second step, structural model also known as the inner model is analyzed to determine the relationships among the constructs as hypothesized by the research model (Amaro & Duarte, 2015).

4.1. Measurement Model

Preceding analysis of the structural model, validity, and reliability of the measurement instrument should be checked (Chin, 2010). Our research model consists of both reflective and formative measures therefore, separate analysis for both reflective and formative measure has been performed since the procedures to check the reliability and validity of reflective and formative measures are different (Diamantopoulos & Winklhofer, 2001).

4.1.1. Assessment of the reflective measures

Hair et al. (2011) and others suggested that the reflective measures should be evaluated through assessing item reliability, internal consistency, convergent validity and discriminant validity. To check the reliability of constructs Cronbach alpha test and composite reliability were calculated. As shown in Table 2, both measures exceeded the threshold of 0.70 suggesting that measurement model has advocate internal reliability (Chin, 1998). Average variance extracted (AVE) and factor loading were calculated to assess

the convergent validity of the instrument. AVE for the reflective constructs surpassed the minimum cut off value of 0.50, ranging from 0.502 to 0.656. All the indicator loading exceeded the minimum threshold of 0.60 (Henseler et al., 2009). Hence convergent validity was proved by both criterions.

Table 2: Reliability and validity

Construct/ Items	Factor Loadings	Cronbach Alpha	AVE	CR	Construct/ Items	Factor Loadings	Cronbach Alpha	AVE	CR
Autonomy		0.752	0.502	0.834	Self-Efficacy		0.721	0.545	0.827
ATN1	0.704				SEC1	0.730			
ATN2	0.734				SEC2	0.734			
ATN3	0.667				SEC3	0.701			
ATN4	0.718				SEC4	0.785			
ATN5	0.718				SEC5	0.730			
Outcome Expectancy		0.826	0.590	0.878	Self-Image		0.825	0.656	0.883
OEX1	0.803				SIM1	0.854			
OEX2	0.804				SIM2	0.839			
OEX3	0.783				SIM3	0.821			
OEX4	0.728				SIM4	0.718			
OEX5	0.720								

Table 3: Discriminant validity

	Autonomy	Outcome Expectancy	Self-Efficacy	Self-Image
Autonomy	0.709			
Outcome Expectancy	0.387	0.768		
Self-Efficacy	0.374	0.471	0.738	
Self-Image	0.155	0.145	0.222	0.810

Following the recommendation of Fornell and Lacker (1981), discriminant validity was evaluated by comparison of the square root of AVE for a given variable and correlation between the constructs. Table 3 reports the values for the square root of AVE's and correlation among the constructs which showed good discriminant validity as AVE for each construct was greater than its correlation with other constructs. In addition to testing Fornell and Lacker criteria, additional measure of Henseler's Heterotrait Monotrait Ratio of Correlation (HTMT) (Henseler, 2015) was used to check discriminant validity among reflective measures. The maximum value in this regard was 0.605 which is well below the most conservative threshold of 0.85 (Kline, 2011).

4.1.2. Assessment of the formative measures

Formative measurement model was validated following guidelines provide by Petter, Straub, and Rai (2007). Firstly multicollinearity was performed through VIF and tolerance level to assess correlation

Table 4: Weights of the indicator of formative construct, multi-screening

Path	Original Sample (O)	Sample Mean (M)	Standard Deviation (STDEV)	T-Statistics (O/STDEV)	P-Value
M1 → Multi-Screening	0.641	0.632	0.053	12.123	0.000
M2 → Multi-Screening	0.570	0.563	0.055	10.271	0.000
M3 → Multi-Screening	0.624	0.617	0.056	11.231	0.000
M5 → Multi-Screening	0.731	0.725	0.049	14.944	0.000
M6 → Multi-Screening	0.818	0.813	0.038	21.418	0.000

among the formative indicators of multi-screening. The generally acceptable threshold for VIF is below 3.3 (Diamantopoulos & Winklhofer, 2001) which was achieved by our model since all the VIF values remained well under 3.3. As well as tolerance remained above its threshold of 0.10. Construct validity was checked by evaluating the significance of the individual item weights on the latent construct of multi-screening. All the 6 items of multi-screening were significantly related to it as presented in Table 4.

4.2. Structural Model

After measurement model demonstrated evidence of reliability and validity, we proceeded further with the analysis of the structural (inner) model which was assessed following the steps recommended by Hair et al. (2014). Firstly collinearity among independent variables in the structural model is assessed through VIF and tolerance level. The VIF between autonomy, self-efficacy, outcome expectancy and self-image remained well under the generally acceptable threshold of 3.3 (Diamantopoulos & Winklhofer, 2001). Moreover the tolerance remained above its threshold of 0.10. Secondly path coefficients were assessed through Bootstrapping with 262 cases and 5000 samples in order to evaluate the significance of the paths. As presented in Table 5, Hypothesis 1,2 & 3 have been supported with $P > 0.001$. Whereas, hypothesis 4 has been rejected. It implies that autonomy, outcome expectancy and self-efficacy influenced multi-screening meaningfully whereas, self-image did not affect multi-screening significantly.

Table 5: Hypotheses testing

Hypotheses	Original Sample (O)	Sample Mean (M)	Standard Deviation (STDEV)	T-Statistics ((O/STDEV)	P-Value
H1: Autonomy → Multi-Screening	0.403	0.405	0.046	8.727	0.000
H2: Outcome Expectancy → Multi-Screening	0.200	0.204	0.048	4.135	0.000
H3: Self-Efficacy → Multi-Screening	0.327	0.329	0.052	6.299	0.000
H4: Self-Image → Multi-Screening	0.031	0.034	0.042	0.747	0.455

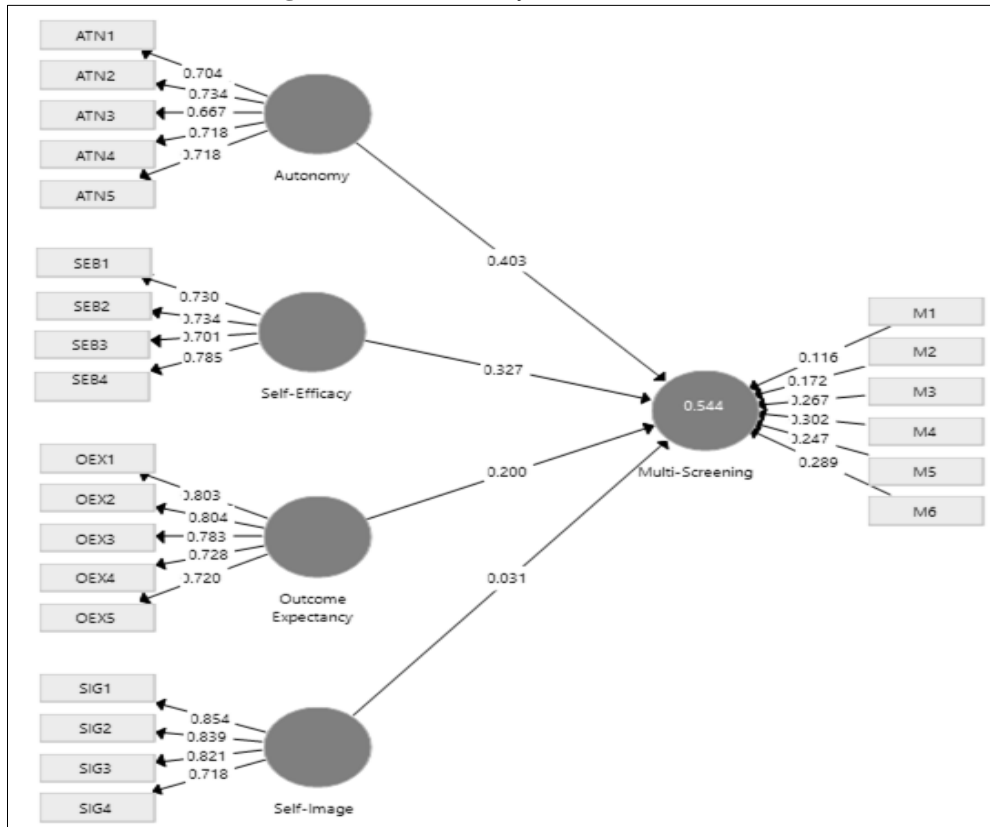
Thirdly the coefficient of determination (R-square) was assessed. Our research model explains 54 % of the variance of dependent variable multi-screening. Since R-square between 0.40 and 0.60 is considered good (Hair et al., 2013). Hence our model has sufficient exploratory power. Fourthly we calculated f-square to assess the effect size between the independent and dependent variables. By convention, f-square effect sizes of 0.35, 0.15 and 0.02, and 0.35 are known as large, medium and small respectively (Cohen, 1988). Our significant variables had effect sizes between medium and large. Lastly predictive relevance (Q-square) was evaluated through blindfolding procedure (Wold, 1982). The cross- validated redundancy value for endogenous construct (multi-screening) was above zero (i.e., 0.166).

5. DISCUSSION

The current research sought to determine individuals' motivation for adopting multi-screening. Following the support from literature current study empirically singled out these most relevant constructs. To assess the measurement model first of all multicollinearity was checked to ensure the validity of our formative measures, which also showed the absence of multicollinearity between formative constructs. Hence, the outer model of this study was found empirically appropriate.

Subsequently, analysis of the structural model was conducted to prove main assumptions of the study. Autonomy is positively associated with multi-screening behavior suggesting that people multitask because

Figure 2: PLS-SEM analysis of research model



they feel the sense of freedom, control, and violation when doing it. Literature has suggested that individuals need to be skillful in order to quickly adopt technology and high-tech devices. The findings of current study conformed this notion by providing empirical support to this idea since self-efficacy appeared to be the meaningful predictor of multi-screening behavior. People with high self-efficacy are more likely to consume multiple devices in order to perform their various activities. Outcome expectancy is a well-established motivation for technology adoption and the finding of the current study are consistent with past research. People seek for some gratification and benefits in order to engage in, and persist with a specific behavior and findings of the current research are in agreement with this conception. Self-image is the only construct which was not supported by this research suggesting that seeking social approval and self-esteem is not the critical factor for young Chinese consumers in order to get involved in multi-screening behavior. This finding is interesting and to some extent contrary to past research which suggests that people seek for desired self-images through using technologically advanced devices in their daily life.

6. IMPLICATIONS

The present research contains originality and value in terms of theoretical and practical implications. A number of theoretical contributions made by this research are the proof of its originality and innovation.

The study unveils a new consumer phenomenon of multi-screening which has been considerably ignored in past research. The multi-screening phenomenon has deep research connections with several other domains, such as marketing, advertising, media, e-commerce, m-commerce, information systems, and information technology. The current study is also useful indirectly for all such fields directly or indirectly linked with multi-screening.

Professionals in the area of advertising, product planning, marketing, mobile software application development, e-commerce, and m-commerce can take some vital insights from this research. By knowing explicitly consumer's motivations behind the use of multiple screens for related or unrelated tasks, they can develop their product and marketing strategies in a better way. As in today's world which is dominated by screens, marketing professionals realize that the device itself is not very important, what matters more is human nature and people's motivation behind their interactions with multiple screens. Current research provided insights in terms of multi-screen adoption motivations. In the era where free will is much desired by the people, consumer also prefer to enjoy autonomy in their choice making. The findings of the study revealed that they do not want to be restricted to particular medium and screen. They move between their devices because they want to self-regulate and self-organize their daily activities. As the lifestyle has changed dramatically in this high tech era and people have now have less time to perform their different activities, they want solutions at their disposal whenever they have time, opportunity and need. Multi-screening has provided them with greater autonomy since, most of the devices offer a wide range of functionality and possibilities. As the consumer have new opportunities to reap benefits out of their devices so does the firms have since they can themselves, visible, affordable, convenient and available by enhancing their presence on various kinds of devices.

The knowledge of predictors and motivation of multi-screening yields insights for information and communication technology managers since it facilitates the better understanding of target consumers, communicate messages more effectively and develop better quality products. System designers may change their product based on media ownership at the customer level, such as the use of communication and information technologies varies between users with high device ownership and the ones with the lower device ownership. The audiences' psychographic characteristics should be the concern for the journalists and advertisers in order to customize messages and also selecting the right media channel or device for message communication. Understanding the motivations of multi-screening will also help professionals adapt their products and information according to device-usage situations in order to maximize the efficiency of work and communication, as well as to provide them with pleasant usage experience with lowest distraction and inefficiency. Devices and their features should be tailored in the way that can enhance consumer's abilities to improve their screen behavior more effectively. In doing so they should strive to make their multi-screening experience more useful and easy to use. Device functionality should be easy to use and the consumer should be educated/trained somehow on device usability. Consumers should also be able to see clear benefits from using these devices since outcome expectancy is the important concern with respect to multi-screen use. Device possibilities should be extended so that people can do whatever they want through their devices and feel and sense of autonomy and control in doing so.

Designers can benefit by better understanding the triggers of multi-screening as it can help them in creating interfaces that are more conducive and optimal in terms of connected and collaborative use of devices. Palladino (2007) added that a boosted understanding of the triggers of task switching can increase user awareness about the phenomenon and help them in curtailing needless self-interruptions when working on important tasks. In the situations when performance results of a person's primary task are perilous and, confining, multi-screening activity with behavioral controls or software restrictions can be advantageous.

7. CONCLUSION AND LIMITATIONS

The study used a sample of 262 young Chinese respondents to explain motivational factors for the adoption of multi-screening behavior. Analysis of measurement and structural model has been conducted through SmartPLS (3.0) which revealed that the measurement model was appropriate for the analysis and structural model explained a reasonable amount of variance for the dependent variable: multi-screening. The following four key motivations were identified through in-depth study of literature: autonomy, self-efficacy, outcome expectancy and self-image. Autonomy, self-efficacy and outcome expectancy appeared as the significant predictor of multi-screening behavior whereas, empirical data analysis did not support the impact of self-image on multi-screening.

Despite its important theoretical and practical implications, the study is limited in terms of the sample since it targeted young Chinese consumer as survey respondents that means, it may not be generalized to other consumer segments. Chinese youth is well equipped with screens and use them frequently but the situation might be different in other countries for the same age segment. Future research should study the multi-screening phenomenon in different cultures and environments involving other consumer segments as well. Typically, a cross-culture study in this regard will be quite helpful.

REFERENCES

- Amaro, S., & Duarte, P. (2015). An integrative model of consumers' intentions to purchase travel online. *Tourism Management*, 46, 64–79. doi:10.1016/j.tourman.2014.06.006
- Bandura, A. (1977). Self-efficacy: towards a unifying theory of behavioral change. *Psychological Review*, 84(2), 191-215. <http://dx.doi.org/10.1037/0033-295X.84.2.191>.
- Barclay, D., Higgins, C., & Thompson, R. (1995). The partial least squares (PLS) approach to causal modeling: personal computer adoption and use as an illustration. *Technology Studies*, 2(2), 285-309.
- Batra, R., & Ahtola, O. T. (1991). Measuring the hedonic and utilitarian sources of consumer attitudes. *Marketing Letters*, 2(2), 159-170.
- Baumeister, R. F., Sparks, E. A., Stillman, T. F., & Vohs, K. D. (2008). Free will in consumer behavior: Self-control, ego depletion, and choice. *Journal of Consumer Psychology*, 18(1), 4-13.
- Bieling, P. J., Beck, A. T., & Brown, G. K. (2000). The sociotropy – autonomy scale: structure and implications. *Cognitive Therapy and Research*, 24(6), 763-780.
- Boateng, H., Adam, D. R., Okoe, A. F., & Anning-Dorson, T. (2016). Assessing the determinants of internet banking adoption intentions: A social cognitive theory perspective. *Computers in Human Behavior*, 65(December), 468–478.
- Cervone, D., Mor, N., Orom, H., Shadel, W. G., & Scott, W. D. (2004). Self-efficacy beliefs and the architecture of personality. In R. F. Baumeister & K. D. Vohs (Eds), *Handbook of Self-regulation. Research, Theory, and Applications* (pp. 188–210). New York: Guilford.
- Cesar, P., Knoche, H., & Bulterman, D. C. A. (2009). From One to Many Boxes: Mobile Devices as Primary and Secondary Screens. In A. Marcus, A. C. Roibas & R. Sala (Eds.), *Mobile TV: Customizing Content and Experience* (pp. 327–348). London: Springer.
- Chin, W. W. (1998). The partial least squares approach to structural equation modeling. In G. A. Marcoulides (Eds.), *Modern methods for business research* (pp. 295-336). Mahwah, NJ: Lawrence Erlbaum Associates.
- Chin, W. W. (2010). How to write up and report PLS analyses. In V. E. Vinzi, W. W. Chin, J. Henseler, & H. Wang (Eds.), *Handbook of partial least squares: Concepts, methods and applications in marketing and related fields* (pp. 655-690). Berlin: Springer.

- Cohen, J. (1988). *Statistical power analysis for the behavioral sciences*. NJ, Hillsdale, Lawrence: Erlbaum.
- Consumer Barometer. (2016). *The Online and Multiscreen World*. Retrieved November 20, 2016, from <https://www.consumerbarometer.com/en/graph-builder/?question=N1&filter=country:china>
- Deci, E. L., & Ryan, R. M. (1987). The support of autonomy and the control of behavior. *Journal of Personality and Social Psychology*, 53(6), 1024–1037.
- Diamantopoulos, A., & Winklhofer, H. M. (2001). Index construction with formative indicators: an alternative to scale development. *Journal of Marketing Research*, 38(2), 269–277.
- Dickerson, S. S., & Kemeny, M. E. (2004). Acute stressors and cortisol responses: a theoretical integration and synthesis of laboratory research. *Psychological Bulletin*, 130(3), 355–389.
- eMarketer. (2015). Multiscreen usage roundup. Retrieved May 30, 2016, from https://www.emarketer.com/public_media/docs/eMarketer_Multiscreen_Usage_Roundup.pdf
- Eveleth, L. B., & Stone, R. W. (2008). Expectancy Theory and Behavioral Intentions to Use Computer Applications. *Interdisciplinary Journal of Information, Knowledge and Management*, 3, 135–146.
- Fornell, C., & Larcker, D. F. (1981). Evaluating structural equation models with unobservable variables and measurement error. *Journal of Marketing Research*, 18(1), 39–50.
- Gilbert, L. A., & Han, H. (2005). Understanding mobile data services adoption: demographics, attitudes or needs? *Technological Forecasting & Social Change*, 72(3), 327–337.
- Google. (2012). *The New Multi-Screen World Study*. Retrieved November 25, 2014, from <https://www.thinkwithgoogle.com/research-studies/the-new-multi-screen-world-study.html>
- Hagger, M. S., Hardcastle, S. J., Chater, a., Mallett, C., Pal, S., & Chatzisarantis, N. L. D. (2014). Autonomous and controlled motivational regulations for multiple health-related behaviors: between- and within-participants analyses. *Health Psychology and Behavioral Medicine*, 2(1), 565–601. doi:10.1080/21642850.2014.912945
- Hair, J. F., Jr., Hult, G. T. M., Ringle, C., & Sarstedt, M. (2013). *A primer on partial least squares structural equation modeling (PLS-SEM)*. USA: SAGE Publications.
- Hair, J. F., Ringle, C. M., & Sarstedt, M. (2011). PLS-SEM: indeed a silver bullet. *Journal of Marketing Theory and Practice*, 19(2), 139–151.
- Hair, J. F., Sarstedt, M., Kuppelwieser, V., & Hopkins, L. (2014). Partial least squares structural equation modeling (PLS-SEM): an emerging tool for business research. *European Business Review*, 26(2), 106–121.
- Henseler, J. (2015). *Is the whole more than the sum of its parts? On the interplay of marketing and design research*. Enschede: University of Twente.
- Henseler, J., Ringle, C. M., & Sarstedt, M. (2012). Using partial least squares path modeling in international advertising research: basic concepts and recent issues. In S. Okazaki (Eds.), *Handbook of research in international advertising* (pp. 252–276). Cheltenham, UK: Edward Elgar Publishing.
- Henseler, J., Ringle, C. M., & Sinkovics, R. R. (2009). The use of partial least squares path modeling in international marketing. *Advances in International Marketing*, 20, 277–319.
- Ho, B. C. T., Chou, Y. T., & O’Neill, P. (2010). Technology adoption of mobile learning: a study of podcasting. *International Journal of Mobile Communications*, 8(4), 468–485.
- Horn, H. (1996). “Autonomy”: An anatomy and a framework, 24(4), 427–435.
- Hsu, M. H., & Chiu, C. M. (2004). Internet self-efficacy and electronic service acceptance. *Decision Support Systems*, 38(3), 369–381. doi:10.1016/j.dss.2003.08.001
- Kline, R. B. (2011). *Principles and practice of structural equation modeling*. New York: Guilford Publications.
- Kononova, A., & Chiang, Y.-H. (2015). Why do we multitask with media? Predictors of media multitasking among Internet users in the United States and Taiwan. *Computers in Human Behavior*, 50(September), 31–41.

- Koo, C., Chung, N., & Nam, K. (2015). Assessing the impact of intrinsic and extrinsic motivators on smart green IT device use: Reference group perspectives. *International Journal of Information Management*, 35(1), 64–79.
- Liao, I., & Deng, Y. (2014). *Understand user-device relationship in multiscreen exercise activity*. Paper presented at the International Conference on Kansei Engineering and Emotion Research, Linköping University, Sweden.
- Lowry, P. B., Zhang, J., & Wu, T. (2017). Nature or nurture? A meta-analysis of the factors that maximize the prediction of digital piracy by using social cognitive theory as a framework. *Computers in Human Behavior*, 68(March), 104–120.
- Maddux, J. E., & Volkmann, J. (2011). Self-Efficacy. In R. H. Hoyleeds (Eds.), *Handbook of Personality and Self-Regulation*. (pp. 315-331). New York: The Guilford Press.
- Mischel, W. (1973). Toward a cognitive social learning reconceptualization of personality. *Psychological Review*, 80(4), 252-283.
- Mischel, W., & Ayduk, O. (2004). Willpower in a cognitive-affective processing system: The dynamics of delay of gratification. In R. F. Baumeister & K.D.Vohs (Eds.), *Handbook of self-regulation: Research, theory, and applications* (pp. 99–129). New York: Guilford Press.
- Moshman, D. (2005). *Adolescent psychological development*. Mahwah, NJ: Erlbaum.
- Nucci, L. P. (2001). *Education in the moral domain*. Cambridge, UK: Cambridge University Press.
- Oliveira, T., Thomas, M., Baptista, G., & Campos, F. (2016). Mobile payment: Understanding the determinants of customer adoption and intention to recommend the technology. *Computers in Human Behavior*, 61(August), 404–414.
- Palladino, L. J. (2007). *Find your focus zone: An effective new plan to defeat distraction and overload*. New York: Free Press.
- Petter, S., Straub, D., & Rai, A. (2007). Specifying formative constructs in information systems research. *MIS Quarterly*, 31(4), 623–656.
- Pikkarainen, T., Pikkarainen, K., Karjaluoto, H., & Pahnla, S. (2004). Consumer Acceptance of Online Banking: An Extension of the Technology Acceptance Model. *Internet Research*, 14(3), 224-235.
- Sarker, S., & Wells, J. D. (2003). Understanding mobile handheld device use and adoption. *Communications of the ACM*, 46(12), 35–40.
- Schlenker, B. R. (2003). Self-presentation. In M. R. Leary, & J. P. Tangney (Eds.), *Handbook of self and identity* (pp. 492-518). New York: Guilford.
- Solomon, O., Shamsuddin, A., Wahab, E. (2013). Identifying factors that determine intention to use electronic banking: a conceptual study. *Middle-East Journal of Scientific Research*, 18(7), 1010–1022.
- Taylor, S. E., & Brown, J. D. (1988). Illusion and Well-Being: A Social Psychological Perspective on Mental Health. *Psychological Bulletin*, 103(2), 193-210.
- Teo, T. S. H., & Pok, S. (2003). Adoption of WAP-enabled mobile phones among Internet users. *Omega*, 31(6), 483–498.
- Tze, V. M. C., Klassen, R. M., & Daniels, L. M. (2014). Patterns of boredom and its relationship with perceived autonomy support and engagement. *Contemporary Educational Psychology*, 39(3), 175–187. <https://doi.org/10.1016/j.cedpsych.2014.05.001>
- Venkatesh, V., Morris, M. G., Davis, G. B., & Davis, F. D. (2003). User Acceptance of Information Technology: Toward a Unified View. *MIS Quarterly*, 27(3), 425–478.
- Venkatesh, V., Thong, J. Y. L., & Xu, X. (2012). Consumer Acceptance and Use of Information Technology: Extending the Unified Theory of Acceptance and Use of Technology. *MIS Quarterly*, 36(1), 157–178.
- Williams, D. M. (2010). Outcome Expectancy and Self-Efficacy: Theoretical Implications of an Unresolved Contradiction. *Personality and Social Psychology Review*, 14(4), 417–425.

- Wold, H. (1982). Soft modeling: the basic design and some extensions. *Systems Under Indirect Observation*, 2, 589-591.
- Wong, C. H., Tan, G. W. H., Hew, T. S., & Ooi, K. B. (2016). Can mobile TV be a new revolution in the television industry? *Computers in Human Behavior*, 55(Part B), 764–776. doi:10.1016/j.chb.2015.10.021
- Yang, B., & Lester, D. (2005). Gender differences in e-commerce. *Applied Economics*, 37, 2077–2089.

APPENDIX

Appendix 1: Measurement instrument

Construct	Items	Items' phrasing
Autonomy	ATN1	Through multi-screening, I feel very strongly that I have the opportunity to make choices with respect to screen usage.
	ATN2	I feel that multi-screening is highly compatible with my choice and interest.
	ATN3	Due to multi-screens, I am not restricted to time and place for my screen based activities.
	ATN4	Using multiple screens gives me more control over my various activities such as leisure.
	ATN5	Through multi-screens, I'm in control of my moment— whether it's a task or a quick bit of fun.
Self-Efficacy	SEB1	I am an expert of using multiple screens with different operating systems and interfaces.
	SEB2	I feel confident using multiple screens to perform my screen based activities.
	SEB3	I feel confident linking/synchronizing my activities across multiple screens.
	SEB4	I feel confident using applications in various handheld devices, like mobile phone and tablet.
Outcome Expectancy	OEX1	Using multi screens improves my performance in my job, work or studies.
	OEX2	Using multiple screens improves my productivity
	OEX3	Using multiple screens is useful for me.
	OEX4	I can speed up my work by using multiple screens.
	OEX5	Using multi screens enables me to resolve problems that need attention now (at a specific moment).
Self-Image	SG1	Using multiple screens to accomplish my various tasks improves the way I am perceived by others.
	SG2	Using multiple screens gives me social approval.
	SG3	People who use multiple screens have more prestige than those who do not
	SG4	Using multiple screens makes a good impression on other people.
Multi-Screening	M1	I often use multiple screens sequentially (at different moments) to perform some related activities.
	M2	I often start something at one screen and continue later at another one.
	M3	I often do multitasking by using multiple screens simultaneously.
	M4	I often use my tablet or smartphone to make what I'm watching on TV more interesting.
	M5	I often stop in middle of one activity at one screen and switch to another screen in order to start something else.
	M6	Often, I am using smartphone to do something else while I am working on my computer or watching TV.