Hindawi
Mobile Information Systems
Volume 2019, Article ID 8968264, 9 pages
https://doi.org/10.1155/2019/8968264

Research Article

Chronotypes' Task-Technology Fit for Search and Purchase in Omnichannel Context

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Received 16 August 2018; Revised 17 December 2018; Accepted 7 February 2019; Published 25 March 2019

Academic Editor: Amon Rapp

Advances in technology have led to a spurt in tech-savvy consumers displaying increasingly complex behavior. In the past, consumers concluded their search and purchases at a single physical store. Nowadays, however, they possess a number of digital devices (desktops and/or mobiles) through which they can switch channels seamlessly to search for information and make a purchase. There are very few studies that investigate desktop and mobile channels separately; this is perhaps the first study that examines the effect of chronotypes (evening- and morning-type individuals) on a sample of Chinese university students using online and mobile channels in the omnichannel process. The results from a sample of 311 digital shoppers (desktops and/or mobiles) confirm that the mobile channel offers greater task-technology fit to evening-type respondents and desktop channels present better task-technology fit to morning-type respondents to engage in the omnichannel process. Furthermore, this study discussed contributions and insights for managers to develop an effective omnichannel strategy.

1. Introduction

In recent times, consumers' shopping behavior has been changing because they have gone through an evolutionary process, moving from brick and mortar models and multichannel to omnichannel [1]. In this regards, the authors have examined the shoppers' behavior across multilevel channels in terms of channel choice, adoption, and usage [2, 3]. Furthermore, studies have analyzed the important drivers behind channel choice and usage which include channel attributes, marketing, psychological, and social factors [2–4]. However, it has been observed that retailing is shifting from the multichannel approach to omnichannel approach because of the introduction of advanced online channels and new digital channels like mobile channels. Consequently, there is a growing number of research studies which investigate mobile commerce, mobile marketing, and social commerce [5–8]. Therefore, researchers are now trying to examine the link of customers' shopping behavior with omnichannel [9]. The omnichannel behavior refers to the use of both digital and physical channels, offering consumers a seamless shopping experience and enabling them to switch channels almost effortlessly [10]. It provides customers the freedom to shop anytime and anywhere, thereby eliminating barriers between channels [11]. Now, it is normal for customers to shop by using digital devices. For example, in the United States alone, 49% of retail sales take place via digital devices (mobile and online) before or during the shopping journey [12]. Moreover, the literature focuses primarily on the choice between offline and online channels for different decision-making stages of shopping [1, 13]. But a new form can be seen in omnichannel with the advancement in technology; customers are now using a growing range of devices for shopping such as tablets, iPads, and smartphones along with computers. Consequently, just as offline and online channels have been segregated, similarly, computers and portable devices (primarily tablets and smartphones) can be separated as they possess evidence-rich differences in terms of portability, screen size, capacity, ease of use, and personality [14, 15]. These two categories of devices also differ in the search and purchase tasks performance, as mobiles offer instant, time-saving, location-

based contents and image and voice search capability, whereas desktops offer more detail-oriented information, better evaluation, and richer contents. Taking this change, the research distinguishing shopping behavior on desktop/online (hereinafter both terms used interchangeably) and mobile channels remains sparse. Exceptions include the study which is conducted by Holmes et al. [16] in which they explore consumers' use of mobile channels in the decision-making process and state the differences in the use of online, offline, and mobile channels, proving that preferences in channel attributes vary between online and mobile customers.

In this regard, there is task-technology fit theory "TTF" introduced by Goodhue and Thompson [17]. The TTF explains optimal choice of technology to perform a task. Moreover, TTF mostly has been investigated from task and technology characteristics point of view [18, 19], but how characteristics of the individual who performs the task effect this fit has been under explored [20, 21]. So question arises that how customer's individual differences can influence the choice between mobile and online omnichannel to perform search and purchase task? Because it is evident from the literature that channel attributes (digital or otherwise) shape customer's choice of the channel at different stages of the decision-making process [22, 23]. Hence, current research attempts to gain insight into omnichannel behavior using a different angle, i.e., incorporating individuals' characteristics and chronotypes (circadian rhythms). The circadian rhythm or chronotype refers to differences in individuals' sleep patterns and time management, which have an impact on their behavior. The literature has confirmed that different chronotypes (evening or morning) exhibit different behaviors and personalities [24]. Morning types prefer to wake up early and complete the tasks in the morning hours. But evening types are used to wake up late and prefer to complete their activities in the evening hours [25]. Initially, the chronotype construct has been studied in biological [26] and psychological fields [27]. However, the concept of chronotype has gained less focus in the field of marketing and business. Exceptions include Hornik and Miniero [28] who investigated chronotypes in relation to waiting time, service evaluation, and ad recall performance and Gullo et al. [29] who studied time of the day in relation to variety seeking behavior. To the best of the authors' knowledge, this is the first study to investigate chronotypes in the omnichannel context. Therefore, this study aims at addressing the important question that how chronotype (morning vs evening types) can influence the choice among the mobile and online channels to perform search and purchase tasks in omnichannel shopping process.

The main gaps filled by this study are as follows. First, prior studies have focused primarily on multichannel marketing while there are very few which investigate omnichannel marketing. While most studies deal with the omnichannel process in terms of offline and online channels (PC), this study incorporates mobile channels as well. In comparison with prior studies, this study examines the two most significant stages of the decision-making process—search and purchase [30]. In particular, this work investigates the collective use of digital and offline channels. Second, this study analyzes how personal constructs that contribute to consumer behavior shape the way consumers are involved in the omnichannel process. Third, by analyzing chronotype variable in the omnichannel process, this study provides a deeper understanding of omnichannel consumer behavior, which will be likely to grab the attention of academicians and businesses alike in future research. Finally, this study explores, how chronotype affect task (search and purchase)-technology (mobile/desktop) fit in omnichannel process.

Furthermore, while prior studies regard omnichannel engagement from the perspective of consumers in the West, this study investigates the omnichannel process in the Chinese context. According to a report by Borak [31], 80% of online shoppers are between 18 and 35 years old. According to Team [32], in the second quarter of 2017, in China, online B2C sales were about US$ 132.6 billion. As most businesses are struggling to develop an omnichannel strategy for mobile consumers, this study will help both academicians and marketers understand the ever-growing base of omnichannel consumers.

2. Literature Review

2.1. Chronotypes. Time is the only finite asset that one cannot get more of, regardless of money and status. Hence, there are several disciplines, notably biology and psychology, which have given much focus on investigating individual differences in terms of time and sleep management and their impact on behaviors. Circadian typology (chronotype or diurnal preferences) consists of three styles of chronotypes, morning types or "larks;" evening types or "owls;" and neither type. Owls have a propensity to sleep late and wake up late; they are more energetic during the evenings and have uneven sleep-wake schedules. In contrast, the larks have a tendency to wake up early and like to complete tasks in the morning. Furthermore, many authors have shown that chronotype has a significant influence on several variables like depression, well-being, personality, and academic achievements [33, 34]. They also exhibit differences in terms of work engagement, educational performance, and so on. Studies have shown that evening types are more addicted to the Internet, computer game, and mobile phone [35, 36]. According to Bartel et al. [37], engaging in information and communications technologies such as the Internet, video games, laptops, and phones is linked to later bedtimes. Further, owls keep their devices on for a longer time [38]. All these attributes are connected to individual differences such as chronotypes, which could have an influence on consumer behavior in device choice for search and purchase purpose. In their research, Hornik and Miniero [28] discovered that subjects showed a greater ability for ad recall during their peak hours rather than their off-peak hours. In their study on users' behavior on Facebook, Horzum and Demirhan [25] confirmed that chronotypes affect attitude. In sum, chronotypes have been studied in relation to many technology and personality behavior-related variables, but it has received less attention in the marketing field. Furthermore, it

can be interesting and worthy to investigate the link of chronotypes with task-technology fit in the omnichannel process.

2.2. Omnichannel. In the recent past, shoppers used to visit physical stores to search for information and make a purchase simultaneously. Today, consumers are well equipped with an ample range of digital devices. These devices are multipurpose in nature and enable information searching and sharing, comparisons between products, finding the best offers, and making purchases through the preferred channel [39]. Now, offline and online shopping is a common practice among consumers. Moreover, as the number of channels and touch points (mobile devices, mobile and laptop apps, and websites) is growing, marketers are presented with considerable challenges to understand consumer behavior in such a dynamic environment. This new phase of digital shopping in which consumers use and switch between different channels seamlessly is called the "omnichannel" process [10, 11]. Omnichannel has been gaining popularity among researchers, for example Kazancoglu and Aydin [40] have explored consumer behavior and purchase intention in omnichannel, Blom et al. [9] unfolded that how purchase behavior is shaped by omnichannel based promotion and studied omnichannel and willingness to pay, Juaneda-Ayensa et al.[11] discovered relationship among technology acceptance and purchase intention in omnichannel context, and Rodríguez-Torrico et al. [41] investigated how personality and individual differences affect the channel choice of omnichannel shoppers. The omnichannel differs from multichannel on the bases of integration of channels, service consistency, and switching ease [1]. The shoppers may search for a product via their mobile phones, compare it on their laptops, evaluate it in the physical store, and finally, make a purchase via their mobile phone. This behavior varies among consumers as every individual is unique and has a different personality and preference. Therefore, this research tends to disentangle the chronotype and omnichannel relation for search and purchase by digital consumers.

2.3. Theoretical Underpinning. Goodhue and Thompson [17] introduced task-technology fit (TTF) theory, which explains the optimal choice of technology to perform a task. It has been widely used by a large number of research studies including to explain the location-based services and user mobility [18], online purchase intention [42], and wireless technology adoption [19]. Moreover, it has been mostly investigated from task and technology characteristics point of view, which implies that task characteristics and technology characteristics determine fitness level between task-technology, but how the characteristics of the individual who performs the task affect this fit has been underexplored [21]. The present research shed the light on TTF through this underexplored angle in omnichannel context that how individuals' chronotype affect the device preference to perform search and purchase tasks in e-commerce.

3. Research Hypotheses

The patterns of mobile usage among evening and morning types are different from each other. Demirhan et al. [43] reported that evening types are more technology oriented and they are more prone to mobile phone usage. In contrast, morning types have more focus on traditional media and are less inclined towards the latest technology [44]. Moreover, Bartel et al. [37] showed that individuals who are more inclined towards mobile usage have late night sleeping habits. And these habits can be prolonged because emissions from mobile phone can delay the circadian rhythm [45]. These individual differences in terms of mobile usage can also influence and shape the consumer omnichannel behavior. It has been examined that benefits offered by mobile devices in terms of size, mobility, and continuous Internet connectivity make it an ideal choice for evening-type consumers as they can search for information, receive instant product recommendations, and make quick purchases anytime and anywhere [15, 46]. Furthermore, mobile search and purchase tasks performance differ from that of online/desktop, as mobiles offer instant, time-saving, location-based contents and image and voice search capability. Hence, it can be assumed that evening types have more tendency towards the use of mobile channel during searching the information of the product and even purchase the product. Or there is a possibility that evening types have more tendency towards the use of the mobile channel to get promotional benefits from the company and perform purchase in physical store.

The prior studies have determined that evening chronotypes are more impulsive personalities [47, 48]. And it has been confirmed that impulsivity is associated with the greater use of smartphones wherein consumers can search for information and make purchases immediately [49]. Today, the digital shopper carries his/her mobile device everywhere and at all times owing to its portability, and mobile marketing signals are designed to boost impulse purchases [50]. The tendency for impulse shopping is stimulus-driven and impulse buyers are expected to respond favorably to these stimuli [51]. Consequently, these stimuli enhance the feeling of urgency among consumers, resulting in this channel attracting more evening-type chronotypes. Keeping in view the above theoretical support, it is positive that

H1. Evening-type chronotypes tend to use more mobile channels than morning-type chronotypes to engage in the omnichannel process.

$H1_o$. Evening-type chronotypes do not use more mobile channels than morning-type chronotypes to engage in the omnichannel process.

H2. Evening-type chronotypes tend to use more mobile channels than online channels to engage in the omnichannel process.

$H2_o$. Evening-type chronotypes do not use more mobile channels than online channels to engage in the omnichannel process.

Furthermore, online omnichannel consumers may lean towards contemplative behaviors. Morning types (larks) are more thought-guided than evening types (owls) [27] and are expected to consider the consequences of their behavior [52]. Larks are associated with consciousness [53, 54], which refers to being goal-directed, careful, and less impulsive. Larks tend to be well organized and detailed information seekers. Moreover, larks rely more on the need for touch to reduce uncertainty and become confident about their judgments. In addition to device attributes (a larger display, high resolution, easy interface, more capacity, and better connection), online channels offer greater access to information [55]. Consumers are confident that computers offer better information and evaluation facilities [56] than smartphones. Individuals use computers mostly in their offices and homes for prolonged periods and display more contemplative behaviors in making a purchase. Smartphone screens are too small for consumers to navigate, search, and evaluate information easily and arrive at a decision [15]. Realizing that haptic information for morning-type consumers can enhance confidence in their judgment [57], online channels offer more detailed information and easier navigation than the mobile one to make the decision-making process easier. Consequently, morning-type shoppers prefer online channels over mobile channels. Therefore,

H3. Morning-type chronotypes tend to use more online channels than evening-type chronotypes to engage in the omnichannel process.

$H3_o$. Morning-type chronotypes do not use more online channels than evening-type chronotypes to engage in the omnichannel process.

H4. Morning-type chronotypes tend to use more online channels than mobile channels to engage in the omnichannel process.

$H4_o$. Morning-type chronotypes do not use more online channels than mobile channels to engage in the omnichannel process.

4. Methodology

4.1. Sample and Data Collection. The sample consists of university students from Beijing (Tsinghua University) and the ancient capital of Xi'an (Xi'an Jiaotong University). The sample is based on the argument of Borak [31] that the Chinese B2C e-commerce retail industry comprises consumers aged 16 to 35 who conduct 85.5% of online shopping and majority university students are tech-savvy and fall under this age category. Furthermore, students in the capital territory (current and ancient) universities come from almost all parts of the country. Taobao, JingDong (JD), and vip.com have over 1 billion monthly active users [31]. Taobao and jd.com are the biggest e-commerce platforms in China. It is remarkable that in the second quarter of 2017, the online B2C retail market surpassed 860 billion yuan (US$ 132.4 billion), an increase of 32% compared to the same time period in 2016 [31]. Therefore, university students were selected as respondents.

The data were collected through a survey from 30th Oct 2017 to 1st Feb 2018 using the convenience sampling method as sample was easily accessible in university premises. In the beginning, the questionnaire was translated into Chinese with the help of a Chinese-English linguistic expert and subsequently distributed to 17 students and three professors for their feedback and recommendations. Necessary changes were made before distributing it to the actual sample. A total of 505 online questionnaires were distributed via WeChat (WeChat is a Chinese multipurpose social app with an active user base of over 1 billion in 2018 and is considered the app for all types of communication because of its wide range of functions and platforms; besides social connections, it can be used for payments, shopping, educational purposes, and so on.) QR code, of which 410 were returned and 311 were found appropriate for further analysis. After scanning the QR code, respondents were directed to the questionnaire which was linked with "wjx.cn" database, a data collection service widely used in China for research purposes. The questionnaires' QR code were distributed till 15th of January 2018 and to make sure that respondents have ample time to scan and respond to QR code, the link to online questionnaire remained active till 1st February 2018. A 5-yuan red packet (money gifted through a WeChat transfer) was given to the respondents to encourage them to complete the survey. It is noteworthy that respondents could submit the questionnaire and receive a coupon from any given IP address only once. This helped us to reduce respondents' bias.

4.2. Operationalization of Variables. In the first part of the survey, respondents were asked about their e-commerce platform and experience in using these platforms in years, age, gender, and education level. The second part of the survey comprises the chronotype and omnichannel process. These variables were adopted from the literature and all of them are reliable according to prior studies. To measure the chronotype, the composite scale of morningness (CSM) was adopted with typologies (morning, evening, neither) based on the 10th and 90th percentiles [58, 59]. The scale has 13 Likert scale items (with 3 items on 5-point and 10 items on 4-point scale) with minimum score of 13 to 55 maximum. The cutoff points for CSM scores in our study were 28 and 38, respectively. While scores lower than 28 denote more eveningness, scores higher than 38 denote more morningness. The dependent variable of our study is the omnichannel process adopted from [41]. The omnichannel process has four items, namely, mobile omnichannel process (a: search offline and purchase mobile; b: search mobile and purchase offline) and online omnichannel process (c: search offline and purchase online; d: search online and purchase offline) ranked on 5 point Likert scale (1 strongly disagree to 5: strongly agree), that show how consumers engage in omnichannel behavior.

5. Data Analysis and Results

Table 1 presents respondents' profile information. The sample is almost equally divided into male and female, and

Table 1: Respondents' profile.

Demographics	Characteristics	Frequency percentage (%)
Gender	Male	48.23
	Female	51.77
Age in years	18–23	45.98
	24–29	28.94
	30–35	11.58
	36 and above	13.5
Educational level	Undergraduate	48.55
	Masters' degree	37.94
	PhD	13.5
E-commerce platform	Taobao	28.62
	Jingdong	5.79
	Both	65.59
Experience in using e-commerce platforms	1 year	9
	2 years	12.86
	Above 2 years	78.14

the majority are bachelors' and masters' students using both e-commerce platforms (Taobao and Jingdong).

The separate confirmatory factor analysis (CFA) is done to determine the factor structure of chronotype scale and omnichannel scale. The results related to CFA of chronotype scale show that model has good fit with $\chi^2/df = 2.03$ ($\chi^2/df < 3$), RMSEA = 0.058 (RMSEA < 0.08), CFI = 0.936 (CFI > 0.90), and NNFI = 0.919 (NNFI > 0.90). The factor loadings range between 0.428 and 0.642. The value of Cronbach alpha is 0.799. These findings show that reliability and validity of chronotype scale are ensured. Moreover, results related to CFA of omnichannel scale show that model has good fit with $\chi^2/df = 2.11$ ($\chi^2/df < 3$), RMSEA = 0.060 (RMSEA < 0.08), CFI = 0.95 (CFI > 0.90), and NNFI = 0.91 (NNFI > 0.90). The factor loadings range between 0.538 and 0.704. The value of Cronbach alpha is 0.718. Hence, reliability and validity of omnichannel scale are also satisfied. In order to test study hypotheses, univariate analysis is conducted with the help of SPSS 20. For that purpose, the variable of chronotype is characterized into two groups (evening type and morning type) based on cutoff scores [58]. According to 10th and 90th percentiles, evening type accounts for 40.24% ($n = 165$), neither accounts for 24.14% ($n = 99$), and morning type accounts for 35.62% ($n = 146$). Furthermore, independent sample t-test is employed to analyze the mean differences among the groups. Results show that the mean value of evening type is 2.84 which is significantly different from the mean value of morning type (3.77) with ($t > 2$, $p < 0.05$). After determination of mean differences among the morning and evening groups, these factors are tested with dependent variables of the study. Tables 2 and 3 show that evening types are more frequent in using mobile channels (mean = 3.95, SD = 0.56) as compared to morning types (mean = 2.71, SD = 0.78) ($F > 5$, $p < 0.05$), hence confirming $H1$ and rejecting $H1_o$.

Furthermore, Tables 4 and 5 show that morning types are more frequent in using online channels (mean = 3.85, SD = 0.61) as compared to evening types (mean = 2.97, SD = 0.87) ($F > 5$, $p < 0.05$), hence confirming $H3$ and rejecting $H3_o$.

Pairwise comparison (Table 6) shows that the mean value of evening types is greater in the mobile omnichannel process as compared to morning types (mean difference = 1.23, $p < 0.05$) and lesser in the online omnichannel process as compared to morning types (mean difference = −0.874, $p < 0.05$), hence confirming $H2$ and rejecting $H2_o$. Moreover, pairwise comparison table reveals that mean value of morning types is greater in online omnichannel process as compared to evening types (mean difference = 0.874, $p < 0.05$) and lesser in mobile omnichannel process as compared to evening types (mean differences = −1.23, $p < 0.05$), hence confirming $H4$ and rejecting $H4_o$.

Finally, a summary of hypotheses is given in Table 7.

6. Discussion

Currently, tech-savvy consumers possess a number of digital devices, notably mobiles and computers to make purchase decisions, which allows them more control and access to the ever-growing electronic commerce world. They use digital devices to collect and disseminate information at every stage of the purchase cycle. This study has incorporated interesting variable chronotype, which denotes individual differences based on their sleep-wake cycle. The results show that evening-type chronotypes tend to use mobile channel more as compared to morning-type chronotypes during omnichannel process. Similar findings are given in [41], which reported that buyers who are high in impulsivity prefer mobile omnichannel as compared to those who are low in impulsivity. And it has been shown that evening types are impulsive in nature. Moreover, research studies show that evening types are more technology oriented and addicted to mobile phone, Internet, and computer games. Furthermore, search and purchase tasks differ from each other on mobiles and desktops, as mobile offers instant, time-saving, location-based, customized contents and image and voice search capability which offer greater task-technology fit for evening-type consumers. The second findings determine that morning types tend to use online or desktop omnichannel more as compared to evening types. Previous research studies suggest that morning types have more focus on detail information and are less risk takers [25, 27, 43]. Therefore, they may choose desktop channels as best source to make buying decisions. This research contributes to the literature in several ways. First, chronotypes are relevant to consumer behavior and have been analyzed for the first time in the omnichannel context. Second, these variables affect channel usage in the omnichannel process at the search and purchase stages and determine channel preference. The findings provide the foundation to conclude that evening types prefer mobile devices and morning types prefer online channels in the omnichannel process. These findings confirm that individual characteristics influence the task-technology fit. The benefits offered by mobile devices in terms of size, mobility, and continuous Internet connectivity make it an ideal choice for evening-type consumers, as they

Table 2: Descriptive statistics on mobile omnichannel frequency use.

	N	Mean	Std. deviation	Std. error	95% confidence interval for mean		Minimum	Maximum
					Lower bound	Upper bound		
Evening	165	3.9467	0.56315	0.04384	3.8601	4.0332	2.50	5.00
Morning	146	2.7123	0.78748	0.06517	2.5835	2.8411	1.00	4.50
Total	311	3.3672	0.91571	0.05193	3.2650	3.4694	1.00	5.00

Table 3: ANOVA results on mobile channel frequency according to chronotypes (evening vs morning).

		Sum of squares	df	Mean square	F	Sig.
Mobile channel	Between groups	118.017	1	118.017	256.941	0.000
	Within groups	141.928	309	0.459		
	Total	259.945	310			

Table 4: Descriptive statistics on online omnichannel frequency use.

	N	Mean	Std. deviation	Std. error	95% confidence interval for mean		Minimum	Maximum
					Lower bound	Upper bound		
Morning	146	3.8493	0.61412	0.05082	3.7489	3.9498	2.00	5.00
Evening	165	2.9758	0.87095	0.06780	2.8419	3.1096	1.00	5.00
Total	311	3.3859	0.87657	0.04971	3.2880	3.4837	1.00	5.00

Table 5: ANOVA results on online channel frequency according to chronotypes (evening vs morning).

		Sum of squares	df	Mean square	F	Sig.
Online channel	Between groups	59.110	1	59.110	101.989	0.000
	Within groups	179.088	309	0.580		
	Total	238.198	310			

Table 6: Pairwise comparisons.

Dependent variable	(I) chronotype	(J) chronotype	Mean difference (I – J)	Std. error	Sig.[b]	95% confidence interval for difference[b]	
						Lower bound	Upper bound
Mobile	Evening	Morning	1.234	0.077	0.000	1.083	1.386
	Morning	Evening	−1.234	0.077	0.000	−1.386	−1.083
Online	Evening	Morning	−0.874	0.086	0.000	−1.044	−0.703
	Morning	Evening	0.874	0.086	0.000	0.703	1.044

Based on estimated marginal means. The mean difference is significant at the 0.05 level. [b]Adjustment for multiple comparisons: least significant difference (equivalent to no adjustments).

Table 7: Summary of hypothesis testing.

Hypothesis no.	Relationship	Results
H1	Evening types ⟶ mobile omnichannel > online omnichannel	Accepted
H2	Evening types > morning types ⟶ mobile omnichannel	Accepted
H3	Morning types ⟶ online omnichannel > mobile omnichannel	Accepted
H4	Morning types > evening types ⟶ online omnichannel	Accepted

can search for information, receive instant recommendations for products, and make quick purchases anytime and anywhere [15, 46]. In the Chinese context, a growing number of mobile phone users, improved lifestyles, trustworthy e-commerce platforms, and, most importantly, WeChat payment and discount coupons on purchases via

mobile devices are among the justifications for such behavior.

Computers and laptops offer exclusive benefits for online omnichannel consumers. Morning-type individuals are good planners, detailed information seekers, and rely on more haptic information to make their decisions. They show contemplative behavior in shopping. The purchasing process is also easier for them as they have access to HD videos, images, and reviews on a large screen, which satisfy their decision-making needs [56]. There is another explanation why consumers use laptops to look for information and make comparisons and subsequently visit the brick-and-mortar store to make the final decision; they need to touch and examine the product before or after a purchase. Furthermore, they may evaluate a product in the store to satisfy their information needs and experience a real-time shopping experience [30]. Therefore, online/desktop channels offer better task-technology fit to morning type shoppers. Finally, through the outcomes of this study, it can be concluded that chronotypes affect the omnichannel process engagement significantly. Evening-type individuals prefer mobile channels over online channels and morning-type individuals favor online channels over mobile channels.

7. Managerial Implications

Today, the omnichannel process consumer uses many channels and devices simultaneously during his/her purchase journey. The divide between digital and physical channels does not appear to be that important as tech-savvy consumers access physical and digital channels interchangeably and expect uniformity in offerings. This notion suggests that businesses need to develop an omnichannel strategy that can cater to the needs of modern consumers and create a uniform experience across all channels. Failing to do so can annoy shoppers and force them to switch to other options easily as they have seamless access to the retail world. Furthermore, as mobile omnichannel consumers are more the evening type and impulsive in nature, they want a quick purchase process. They are more active and access their mobile devices late at night, and therefore companies should design strategies that provide them with a quick and easy shopping experience. To do so, marketers need to develop an app and/or website that is easy to check-in, check-out, and navigate. The information and product display size and quality must be appropriate. As evening-type consumers are late night mobile users, companies can offer them impulsive nature products on mobile channels to receive a favorable response. Providing Wi-Fi facilities in stores can yield positive responses from such consumers as they can connect their mobile devices to carry out multipurpose tasks and thus arrive at a decision. Offering discount coupons on purchase via mobile channels can also attract the traffic. Furthermore, mobile-based location marketing is a growing trend and evening types are risk takers and innovation seekers, so they are more open to share their location and information which can help businesses to target them effectively Moreover, morning types have risk prevention focus; they have less tendency to share their location and private information; thus, marketers should make strategy accordingly to target them. Another insight for marketers is that evening types face more health-related issues, including insomnia, obesity, and addiction to gaming, so gym businesses and fitness consultants can target such persons over mobile channel to yield favorable response. Furthermore, mobile marketing is a growing trend and if marketers know their potential customers and their channel preference, then they can tailor their marketing signals (SMS, MMS, and Websites) accordingly.

Data Availability

This research is part of a series of research studies conducted by a group of researchers, and few parallel studies are still in progress; the data used to support the findings of this study are currently under embargo, while the research findings are commercialized. Requests for data after 12 months of publication of this article will be considered by the corresponding author with mutual consultation of related group members and researchers.

Additional Points

This study, like others, has its limitations too. For instance, in the Chinese context, mobile channels have a greater use than online channels in general, contrary to prior studies conducted in the West state. Therefore, further research in different countries and cultures can be interesting. Furthermore, while this study investigates the omnichannel process in general, future studies can consider investigating different product categories. While this study used the internal aspects of consumers, future studies can investigate external dimensions such as channel attributes. As chronotypes have been classified into morning- and evening-type consumers only, future studies can include the "neither type" too for a deeper understanding of consumer psychology.

Conflicts of Interest

The authors declare that they have no conflicts of interest.

References

[1] P. C. Verhoef, P. K. Kannan, and J. J. Inman, "From multichannel retailing to omni-channel retailing," *Journal of Retailing*, vol. 91, no. 2, pp. 174–181, 2015.

[2] R. Venkatesan, V. Kumar, and N. Ravishanker, "Multichannel shopping: causes and consequences," *Journal of Marketing*, vol. 71, no. 2, pp. 114–132, 2007.

[3] A. Ansari, C. F. Mela, and S. A. Neslin, "Customer channel migration," *Journal of Marketing Research*, vol. 45, no. 1, pp. 60–76, 2008.

[4] U. M. Dholakia, B. E. Kahn, R. Reeves, A. Rindfleisch, D. Stewart, and E. Taylor, "Consumer behavior in a multichannel, multimedia retailing environment," *Journal of Interactive Marketing*, vol. 24, no. 2, pp. 86–95, 2010.

[5] Y. H. D. Chou, T. Y. D. Li, and C. T. B. Ho, "Factors influencing the adoption of mobile commerce in Taiwan," *International Journal of Mobile Communications*, vol. 16, no. 2, pp. 117–134, 2018.

[6] J. Heo and C. W. Chang, "Factors influencing intention to accept location-based mobile advertising among young mobile user segments: a social exchange perspective," *International Journal of Mobile Communications*, vol. 16, no. 6, pp. 607–623, 2018.

[7] C. W. Hsu and C. C. Yeh, "Understanding the critical factors for successful M-commerce adoption," *International Journal of Mobile Communications*, vol. 16, no. 1, pp. 50–62, 2018.

[8] A. Waheed and J. Yang, "The impact of mobile marketing on online consumer buying behaviour: empirical evidence from Pakistan," *International Journal of Mobile Communications*, vol. 16, no. 6, pp. 624–643, 2018.

[9] A. Blom, F. Lange, and R. L. Hess Jr., "Omnichannel-based promotions' effects on purchase behavior and brand image," *Journal of Retailing and Consumer Services*, vol. 39, pp. 286–295, 2017.

[10] C. Lazaris and A. Vrechopoulos, "From multi-channel to "omnichannel" retailing: review of the literature and calls for research," in *Proceedings of 2nd International Conference on Contemporary Marketing Issues (ICCMI)*, pp. 18–20, Athens, Greece, June 2014.

[11] E. Juaneda-Ayensa, A. Mosquera, and Y. Sierra Murillo, "Omnichannel customer behavior: key drivers of technology acceptance and use and their effects on purchase intention," *Frontiers in Psychology*, vol. 7, p. 1117, 2016.

[12] Deloitte, *Navigating the New Digital Divide. A Global Summary of Findings from Nine Countries on Digital Influence in Retail*, Deloitte, London, UK, 2016, https://www2.deloitte.com/global/en/pages/consumer-business/articles/gx-global-digital-divide-retail.html.

[13] A. Hübner, J. Wollenburg, and A. Holzapfel, "Retail logistics in the transition from multi-channel to omni-channel," *International Journal of Physical Distribution & Logistics Management*, vol. 46, no. 6-7, pp. 562–583, 2016.

[14] K. Yang and H. Y. Kim, "Mobile shopping motivation: an application of multiple discriminant analysis," *International Journal of Retail & Distribution Management*, vol. 40, no. 10, pp. 778–789, 2012.

[15] L. Gao, K. A. Waechter, and X. Bai, "Understanding consumers' continuance intention towards mobile purchase: a theoretical framework and empirical study-a case of China," *Computers in Human Behavior*, vol. 53, pp. 249–262, 2015.

[16] A. Holmes, A. Byrne, and J. Rowley, "Mobile shopping behaviour: insights into attitudes, shopping process involvement and location," *International Journal of Retail & Distribution Management*, vol. 42, no. 1, pp. 25–39, 2013.

[17] D. L. Goodhue and R. L. Thompson, "Task-technology fit and individual performance," *MIS Quarterly*, vol. 19, no. 2, pp. 213–236, 1995.

[18] J. Gebauer and Y. Tang, "Applying the theory of task-technology fit to mobile technology: the role of user mobility," *International Journal of Mobile Communications*, vol. 6, no. 3, pp. 321–344, 2008.

[19] D. C. Yen, C.-S. Wu, F.-F. Cheng, and Y.-W. Huang, "Determinants of users' intention to adopt wireless technology: an empirical study by integrating TTF with TAM," *Computers in Human Behavior*, vol. 26, no. 5, pp. 906–915, 2010.

[20] C.-C. Lee, H. K. Cheng, and H.-H. Cheng, "An empirical study of mobile commerce in insurance industry: task-technology fit and individual differences," *Decision Support Systems*, vol. 43, no. 1, pp. 95–110, 2007.

[21] E. M. Overby and B. Konsynski, *Task-Technology Fit and Process Virtualization Theory: An Integrated Model and Empirical Test*, 2010.

[22] P. C. Verhoef, S. A. Neslin, and B. Vroomen, "Multichannel customer management: understanding the research-shopper phenomenon," *International Journal of Research in Marketing*, vol. 24, no. 2, pp. 129–148, 2007.

[23] S. Gensler, P. C. Verhoef, and M. Böhm, "Understanding consumers' multichannel choices across the different stages of the buying process," *Marketing Letters*, vol. 23, no. 4, pp. 987–1003, 2012.

[24] V. Natale, A. Alzani, and P. Cicogna, "Cognitive efficiency and circadian typologies: a diurnal study," *Personality and Individual differences*, vol. 35, no. 5, pp. 1089–1105, 2003.

[25] M. B. Horzum and E. Demirhan, "The role of chronotype on Facebook usage aims and attitudes towards Facebook and its features," *Computers in Human Behavior*, vol. 73, pp. 125–131, 2017.

[26] A. B. Reddy and J. S. O'Neill, "Healthy clocks, healthy body, healthy mind," *Trends in Cell Biology*, vol. 20, no. 1, pp. 36–44, 2010.

[27] J. F. Díaz-Morales, "Morning and evening-types: exploring their personality styles," *Personality and Individual Differences*, vol. 43, no. 4, pp. 769–778, 2007.

[28] J. Hornik and G. Miniero, "Synchrony effects on customers' responses and behaviors," *International Journal of Research in Marketing*, vol. 26, no. 1, pp. 34–40, 2009.

[29] K. Gullo, J. Berger, J. Etkin, and B. Bollinger, "Does time of day affect variety-seeking?," *Journal of Consumer Research*, 2019.

[30] M. T. Elliott, F. Q. Fu, and P. S. Speck, "Information search and purchase patterns in a multichannel service industry," *Services Marketing Quarterly*, vol. 33, no. 4, pp. 292–310, 2012.

[31] M. Borak, "Data shows 2017 was the year of e-commerce apps: report," 2018, https://technode.com/2018/01/31/2017-e-commerce-apps/.

[32] C. Team, "Mobile share exceeded 80% in China online shopping market in Q2 2017," 2017, https://www.chinainternetwatch.com/22461/mobile-shopping-q2-2017/#ixzz5BaiNfMZD.

[33] S. Rouis, M. Limayem, and E. Salehi-Sangari, *Impact of Facebook Usage on Students' Academic Achievement: Role of Self-Regulation and Trust*, 2011.

[34] E. C. Tandoc, P. Ferrucci, and M. Duffy, "Facebook use, envy, and depression among college students: is facebooking depressing?," *Computers in Human Behavior*, vol. 43, pp. 139–146, 2015.

[35] C. Randler, M. B. Horzum, and C. Vollmer, "Internet addiction and its relationship to chronotype and personality in a Turkish University student sample," *Social Science Computer Review*, vol. 32, no. 4, pp. 484–495, 2014.

[36] C. Vollmer, C. Randler, M. B. Horzum, and T. Ayas, "Computer game addiction in adolescents and its relationship to chronotype and personality," *Sage Open*, vol. 4, article 2158244013518054, 2014.

[37] K. A. Bartel, M. Gradisar, and P. Williamson, "Protective and risk factors for adolescent sleep: a meta-analytic review," *Sleep Medicine Reviews*, vol. 21, pp. 72–85, 2015.

[38] S. Kauderer and C. Randler, "Differences in time use among chronotypes in adolescents," *Biological Rhythm Research*, vol. 44, no. 4, pp. 601–608, 2013.

[39] A. Rapp, T. L. Baker, D. G. Bachrach, J. Ogilvie, and L. S. Beitelspacher, "Perceived customer showrooming behavior and the effect on retail salesperson self-efficacy and performance," *Journal of Retailing*, vol. 91, no. 2, pp. 358–369, 2015.

[40] I. Kazancoglu and H. Aydin, "An investigation of consumers' purchase intentions towards omni-channel shopping,"

International Journal of Retail & Distribution Management, vol. 46, no. 10, pp. 959–976, 2018.

[41] P. Rodríguez-Torrico, R. San José Cabezudo, and S. San-Martín, "Tell me what they are like and I will tell you where they buy. An analysis of omnichannel consumer behavior," *Computers in Human Behavior*, vol. 68, pp. 465–471, 2017.

[42] Y.-S. Chen and S. Y. B. Huang, "The effect of task-technology fit on purchase intention: the moderating role of perceived risks," *Journal of Risk Research*, vol. 20, no. 11, pp. 1418–1438, 2017.

[43] E. Demirhan, C. Randler, and M. B. Horzum, "Is problematic mobile phone use explained by chronotype and personality?," *Chronobiology International*, vol. 33, no. 7, pp. 821–831, 2016.

[44] G. Nimrod, "Early birds and night owls: differences in media preferences, usages, and environments," *International Journal of Communication*, vol. 9, p. 21, 2015.

[45] S. J. Crowley, E. Van Reen, M. K. Lebourgeois et al., "A longitudinal assessment of sleep timing, circadian phase, and phase angle of entrainment across human adolescence," *PLoS One*, vol. 9, no. 11, Article ID e112199, 2014.

[46] R. J.-H. Wang, E. C. Malthouse, and L. Krishnamurthi, "On the go: how mobile shopping affects customer purchase behavior," *Journal of Retailing*, vol. 91, no. 2, pp. 217–234, 2015.

[47] G. M. Cavallera and S. Giudici, "Morningness and eveningness personality: a survey in literature from 1995 up till 2006," *Personality and Individual Differences*, vol. 44, no. 1, pp. 3–21, 2008.

[48] A. Adan, V. Natale, H. Caci, and G. Prat, "Relationship between circadian typology and functional and dysfunctional impulsivity," *Chronobiology International*, vol. 27, no. 3, pp. 606–619, 2010.

[49] J. Drennan and G. Mort, *Examination of the Influence of Personal Attributes on Consumer Use on m-Services*, 2003.

[50] S. San-Martin and B. López-Catalán, "How can a mobile vendor get satisfied customers?," *Industrial Management & Data Systems*, vol. 113, no. 3, pp. 156–170, 2013.

[51] D. W. Rook and R. J. Fisher, "Normative influences on impulsive buying behavior," *Journal of Consumer Research*, vol. 22, pp. 305–313, 1995.

[52] K. Nowack and E. Van Der Meer, "Are larks future-oriented and owls present-oriented? Age- and sex-related shifts in chronotype-time perspective associations," *Chronobiology International*, vol. 30, no. 10, pp. 1240–1250, 2013.

[53] A. L. Hogben, J. Ellis, S. N. Archer, and M. Von Schantz, "Conscientiousness is a predictor of diurnal preference," *Chronobiology International*, vol. 24, no. 6, pp. 1249–1254, 2007.

[54] L. Tonetti, M. Fabbri, and V. Natale, "Relationship between circadian typology and big five personality domains," *Chronobiology International*, vol. 26, no. 2, pp. 337–347, 2009.

[55] A. A. Ozok and J. Wei, "An empirical comparison of consumer usability preferences in online shopping using stationary and mobile devices: results from a college student population," *Electronic Commerce Research*, vol. 10, no. 2, pp. 111–137, 2010.

[56] T. J. Strader and A. Inapudi, "User perceptions of mobile and online channels for purchasing financial products," *Journal of Internet Commerce*, vol. 3, no. 1, pp. 91–101, 2004.

[57] J. Peck and T. L. Childers, "To have and to hold: the influence of haptic information on product judgments," *Journal of Marketing*, vol. 67, no. 2, pp. 35–48, 2003.

[58] C. S. Smith, C. Reilly, and K. Midkiff, "Evaluation of three circadian rhythm questionnaires with suggestions for an improved measure of morningness," *Journal of Applied psychology*, vol. 74, no. 5, pp. 728–738, 1989.

[59] I. Önder, Ş. Beşoluk, and M. B. Horzum, "Psychometric properties of the Turkish version of the composite scale of morningness," *Spanish Journal of Psychology*, vol. 16, 2013.