

ANALYSIS OF THE TASK-TECHNOLOGY FIT MODEL APPLIED TO WHATSAPP AS A PREFERENCE OF YOUNG USERS OF MOBILE INSTANT MESSENGERS

ANÁLISE DO MODELO DE AJUSTE TECNOLOGIA-TAREFA APLICADO AO WHATSAPP COMO PREFERÊNCIA DOS JOVENS USUÁRIOS DE MOBILE INSTANT MESSENGERS

ANÁLISIS DEL MODELO DE AJUSTE DE TECNOLOGÍA-TAREA APLICADO A WHATSAPP COMO PREFERENCIA DE USUARIOS JÓVENES DE MENSAJEROS INSTANTÁNEOS MÓVILES

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ABSTRACT

The purpose of this article is to analyze the technology-task adjustment model applied to WhatsApp as a preferred communication method by young Mobile Instant Messengers (MIM) users. Thus, we conducted a survey (n=567) and a multivariate data analysis through Structural Equation Modeling. Only one hypothesis of the model was rejected showing that hedonic needs do not influence needs perceived by users. Users do not realize pleasure as a need when it comes to MIMs with communication-oriented features and is not exclusively for fun. We also found that the behavioral profile of young users to perceive the importance of motivational needs, technological characteristics, perceived needs, satisfaction, and privacy, to generate the intention to continue using the mobile communication tool.

Keywords: Mobile Instant Messengers; Task-Technology Fit Model; WhatsApp; Young Users.

RESUMO

O objetivo deste artigo é analisar o modelo de ajuste tecnologia-tarefa aplicado ao WhatsApp, como estratégia de preferência dos jovens usuários de Mensageiros Instantâneos Móveis (MIM). Neste estudo, aplicamos um levantamento (n=567) com o uso da análise multivariada de dados e apoio da Modelagem de Equações Estruturais. Quando se trata de um MIM com funcionalidades voltadas para a comunicação, e não para a diversão, os usuários não percebem o prazer atrelado como uma necessidade. Além disso, foi possível verificar o perfil comportamental dos jovens usuários, bem como perceber a importância das necessidades motivacionais, características tecnológicas, necessidades percebidas, satisfação e privacidade para gerar, nos usuários, a intenção de continuidade de uso da ferramenta de comunicação *online*.

Palavras-chave: Mensageiros Instantâneos Móveis; Modelo de Ajuste Tecnologia-Tarefa; WhatsApp; Jovens usuários.

RESUMEN

El propósito de este artículo es analizar el modelo de ajuste tecnología-tarea aplicado a WhatsApp, como estrategia preferida por los jóvenes usuarios de Mobile Instant Messenger (MIM). En este estudio, aplicamos una encuesta (n=567) utilizando análisis de datos multivariados y el apoyo del modelado de ecuaciones estructurales. Solo se rechazó una hipótesis del modelo, señalando que las necesidades hedónicas no influyen en las necesidades percibidas por los usuarios. Cuando se trata de un MIM con funciones destinadas a la comunicación en lugar de la diversión, los usuarios no perciben el placer adjunto como una necesidad. Además, fue posible verificar el perfil de comportamiento de los usuarios jóvenes, así como darse cuenta de la importancia de las necesidades motivacionales, características tecnológicas, necesidades percibidas, satisfacción y privacidad para generar, en los usuarios, la intención de seguir utilizando la herramienta de comunicación online.

Palavras-chave: Mensajería Instantánea Móvil; Modelo de Ajuste de Tecnología-Tarea; WhatsApp; Usuarios jóvenes.

1 INTRODUCTION

New Information and Communication Technology (ICT) environments and the extensive use of smartphones and tablets have provided rapid changes in interpersonal communication, causing changes in technological development and social values (CHO; KIM, 2013). One of the widely disseminated and used mobile services is Mobile Instant Messengers (MIMs) which provides communication services that overcome barriers of time, space and cost (NAM; KIM; JIN, 2013). With the increasing use of MIMs, it is possible to say that smartphone users are increasingly dependent on this technology for their communications (WOONGSUP; HOWON, 2013).

Instant messaging broadens and democratizes information dissemination channels, while increasing communication and interconnectivity among users. This technology gives companies advantages such as cost reduction, value creation, virtualization, mobility, innovation and product differentiation, generating consistent data results in searching for information, suggestion records and promotions.

This research is an extension of the original Lin (2016) model published on Online Information Review, devised in Taiwan, with an audience of market professionals. The Taiwanese model's objective was to research and evaluate the communication behavior of Line instant messenger users. This was completed through a structural model that suggests that the main factors that provoke the intention of continue to use mobile communication software services are modification and satisfaction of the perceived needs of the technology. The study by Lin (2016) indicates that the perceived need for technological adjustment is the crucial factor affecting all communication behavior in MIMs, compared to traditional text messaging. MIMs allow users to communicate with each other, share photos, videos, music and documents in a variety of formats, interactive spaces and games. The adjustment between the users' needs and technological characteristics provided should be considered in the provision of MIMs services.

For this study, we chose to use the WhatsApp Messenger application (the most used social media application in Brazil), with respondents with a demographic profile different from Lin's (2016) study, which consisted of young people, under the age of 20, who have

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graduated. Furthermore, we added another mediating variable to the extension of the model, Privacy, due to its importance in the security and preservation of personal information in digital environments.

A contribution of this study is to present a discussion on the use of a mobile virtual tool, with observations regarding the opposition of generations and some particularities of the individuals, such as country of origin, different culture and other demographic profile aspects.

The literature indicates its use for augmented reality, distance learning, technological readiness index, and system of control of distance. Considering the themes addressed, we identified a gap and an opportunity to carry out this research. Therefore, the purpose of this article is to understand the analysis of the Task-Technology Fit model applied to WhatsApp as a preference for young users of Mobile Instant Messengers.

This paper begins with this introduction and then presents the theoretical reference, which aims to support the construction of the theoretical model and the hypotheses that were tested. Next is a description of the method that guided the empirical phase and then the results are presented. In the last section, conclusions, managerial implications and limitations are discussed.

2 THEORETICAL FRAMEWORK

2.1 MOBILE INSTANT MESSENGERS (MIMS) TECHNOLOGY AND ITS TECHNOLOGICAL CHARACTERISTICS

MIMs are asynchronous communication tools that work through wireless, handheld devices over the internet and connections over the internet and allow people to interact and talk in real time. MIMs provide a context for interactivity with an online presence report (CHURCH; OLIVEIRA, 2013). There is a wide variety of downloadable mobile applications available for free or at an affordable price (GILL, 2008). The use of applications is stimulated by devotion to the brand and in this case, by devotion to the applications, ease of use and past experience in the use of technologies of virtual networks and the hedonic and utilitarian

values (OKADA, 2005, VAN DER HEIJDEN, 2004, LIM; ANG, 2008, PIMENTEL; REYNOLDS, 2004, HOCH; DEIGHTON, 2018, COWLEY; MITCHELL, 2003, WEISS, 2009).

Both utilitarian and hedonic needs, and social impact directly and positively influence the perceived needs of users. Technological features, such as support services and user control, positively influence the users' perception of the needs. Thus, the mobile convenience allows the use of the software at any time and place, if desired, improving the user's perception of technological need.

2.2 TASK-TECHNOLOGY FIT ADJUSTMENT MODEL AND INTEGRATION WITH THE TECHNOLOGY ACCEPTANCE MODEL

Task-Technology Fit (TTF) was proposed by Goodhue and Thompson (1995) and considers that using technologies only occurs when the functions meet the needs of tasks. TTF was primarily used to explore company performance of information systems, investigating the characteristics of the tasks of employees and systems. However, when considering users as individuals, TTF was adopted as a theoretical basis to explore users' usage behaviors or their application in other fields (LIN, 2012, YEN et al., 2010). The combination of TTF with the Technology Acceptance Model (TAM) generates a model that can be used to explore user satisfaction, consumer buying behaviors and intentions of use in commerce electronic.

The frameworks of TTF (which provides for application-using behaviors) and Unified Theory of Acceptance and Use of Technology (UTAUT) have been integrated to explore users' intent to use banks and financial institutions, and the findings have shown TTF as the main factor that impacts users' acceptance (LU; YANG, 2014, ZHOU; JIN; FANG, 2014). TTF is considered part of an essential theory for exploring factors that influence people's behavior in the use of technologies (YANG, 2013). The TTF model is divided into two parts: the motivation needs and the technological characteristics.

2.3 RESEARCH MODEL AND HYPOTHESES

The next subsections address each construct: Motivation Needs (Utility, Hedonic, and Social Needs), Technological Features (Mobile Convenience, Service Compatibility and User Control), Perceived Needs, Satisfaction, and Privacy.

2.3.1 Motivation needs

Utilitarian, hedonic and social needs

The Uses and Gratifications Theory (UGT) presented by Katz, Blumer and Gurevitch (1974) aims to explain people's active demand for specific media to meet specific needs. This theory has been applied by many researchers in explaining patterns of individual behavior and verification theories, serving as the basis for several studies that have expanded several research models (RAACKE; BONDS-RAACKE, 2008, WEI et al., 2015). Users perceive their needs and choose the most appropriate media to satisfy the corresponding motives (STAFFORD; STAFFORD; SCHKADE, 2004). Thus, if users' motives are met, a critical factor impacting their attitude toward media use is created (KO; CHO; ROBERTS, 2005). Thus, users' motives affect their decision to use information technology (RAACKE; BONDS-RAACKE, 2008).

The needs of application users, which influence their attitudes, are either task oriented or societal (LU; YANG, 2014). Mobile communication applications provide instant communication functions and built-in image publishing tools, as well as entertainment and social networking functions. Raacke and Bonds-Raacke (2008) investigated social networks and found users' motives for using networks can be divided into two types: the need for friends (social need) and the need for information (utilitarian need). Wei et al. (2015) divided the motivational needs of users into informational need (external motive) and social need (internal motive). These motifs compose the motivational needs for the use of information technologies, exposed in the need's technology model (IP; WAGNER, 2008). On this basis, the following hypotheses were proposed:

H_{1a(+)}: Utilitarian motivational needs positively influence needs perceived by users.

H_{1b(+)}: Hedonic motivational needs positively influence needs perceived by users.

H_{1c(+)}: Social motivational needs positively influence needs perceived by users.

2.3.2 Technological characteristics

Mobile Convenience

Mobile devices allow the convenience of real-time services (LIN; LU, 2015), being used anytime and anywhere (KIM; HWANG, 2012). Users can use mobile-value-added services on their mobile phones (KLEIJNEN; RUYTER; WETZELS, 2007), and download and run MIMs with their mobile devices. Thus, the following hypothesis was proposed:

H_{2a(+)}: Mobile convenience positively influences the needs perceived by users.

Service Compatibility

Service compatibility indicates the product is consistent with the consumer's value and lifestyle (MEUTER et al., 2005). Consumers use mobile value-added services primarily to meet specific service needs (KLEIJNEN; RUYTER; WETZELS, 2007) and service compatibility exists when these services are consistently compatible with user needs (LIN; LU, 2015). When users realize using MIMs allows them to enjoy the same technology features they have experienced on a PC, their service needs are met. Therefore, the following hypothesis was proposed:

H_{2b(+)}: Service compatibility positively influences the needs perceived by users.

User Control

Complexity can be defined as when a product or service is perceived as difficult to understand or there is a degree of difficulty faced by users to learn specific operating procedures before using a technology or device (KLEIJNEN; RUYTER; WETZELS, 2007). The ease of using a system implies that users understand the structure, interface, functions and contents of the system (FLAVIÁN; GUINALÍU; GURREA, 2006). If users can understand system operation with ease, they can operate the functions of an MIM without the need for multiple interfaces, and if they can control the MIM services, the control is satisfactory, and the needs are met. The following hypothesis was then proposed:

H_{2c(+)}: The user control positively influences the needs perceived by the user.

Perceived needs

The TTF theory is a theoretical framework for explaining a user's behavior when using information technology (IP; WAGNER, 2008, LIN, 2012, YEN et al., 2010) and affects the use of this technology. The motivation of the task with the needs of the users was replaced by a model of adjustment of technological needs. The TTF theory found that when a system is used, perceived information technology significantly influences users' satisfaction and their behavioral intent to continue using the system.

It is considered that when users perceive a good fit between their needs and the technological characteristics of the MIMs, their behavioral intention to continue using the technology and their satisfaction are increased. Expressed as:

H₃₍₊₎: Perceived needs positively influence the user's intention to continue using WhatsApp Messenger.

H₄₍₊₎: Perceived needs positively influence user satisfaction in using WhatsApp Messenger.

Satisfaction

In studies on information systems and e-commerce, it has been found that satisfaction plays a key role in customer retention and encourages them to continue to use products or services (LIN, 2012, OGHUMA et al., 2016, YU et al., 2013). In the context of MIMs, user satisfaction with mobile communication software is one of the factors that influence the behavioral intention of continuing to use the software. The following hypothesis is formulated:

H₅₍₊₎: Satisfaction positively influences users' intent to continue using WhatsApp Messenger.

Privacy

Many Internet users have privacy as their biggest concern, which makes online security measures imperative. Users care about the way in which their personal information is used and the control they have over them. The possibility of loss of privacy causes uncertainty and the need for trust in users. Privacy is a competitive advantage of MIMs, which provides user satisfaction along with the potential to reduce transaction costs, while avoiding the breach of confidentiality and the harm associated with repairing that situation (WU; TSANG, 2008). When an MIM, such as WhatsApp Messenger, gives users options to allow or restrict other users 'access to their personal information', users' privacy is directly affected, and each user chooses what information he or she wishes to make available. However, more people are beginning to use mobile instant messengers (LIAO; HUANG; HSIEH, 2015).

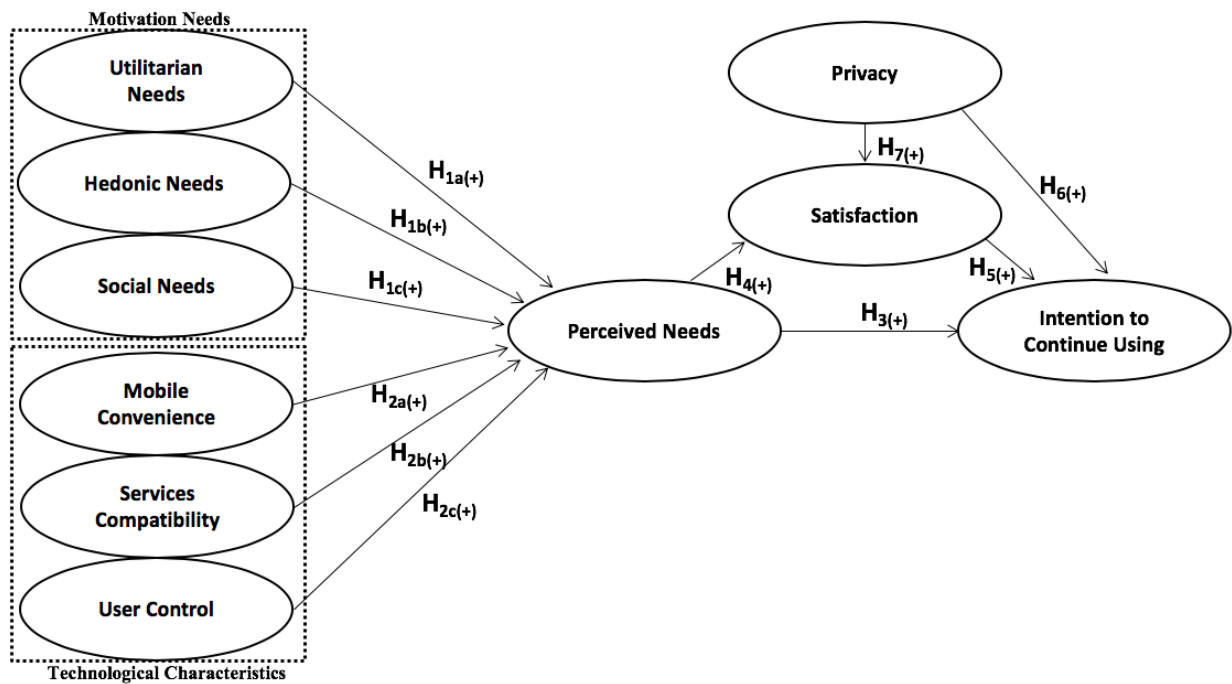
From the perception of the user, if their privacy needs are being met and respected, satisfaction with the use of the application occurs. In this sense, the following hypotheses were formulated:

H₆₍₊₎: Privacy positively influences users' intent to continue using WhatsApp Messenger.

H₇₍₊₎: Privacy positively influences user satisfaction with WhatsApp Messenger.

The theoretical model elaborated from the theory described in the subsections is illustrated in Figure 1, and the circles represent the variables and the arrows denote the hypotheses:

Figure 1 – Theoretical Model



Source: Adapted from Lin (2016).

3 METHOD

The data collection method was convenience sampling, a non-probabilistic technique, which limits the generalization of the research results (MALHOTRA, 2015). In this study we applied a survey with adapted scales (Appendix A). First, we used the Lin (2016) model, from which all the constructs were used: Utility Needs, Hedonic Needs, Social Needs, Mobile Convenience, Service Compatibility, User Control, Perceived Needs, Satisfaction and Intent to Continue Using. In conjunction with this model, we also used the Privacy construct, extracted from Malhotra, Kim and Agarwal (2004). The database was composed of the data obtained after the application of the questionnaire.

The data collection instrument was composed of 11 descriptive and 31 assertive questions, which compose the theoretical model. We used the Likert scale with end points anchored in 1=totally disagree and 5=totally agree. For aspects such as respondent's age, gender, educational level, family income and labor situation, descriptive questions were included.

Regarding the data collection we carried it out in person and in the online environment (such as Facebook and WhatsApp Messenger itself), with the help of the online survey program QuestionPro. For the adaptation of the model to the Brazilian context, the reverse translation process was used, and a questionnaire was applied and performed a pre-test with 25 individuals to verify the comprehension of the research instrument. After the test, the 576 valid questionnaires composed the final sample. To prepare the data for analysis, we eliminated questionnaires from respondent outliers (those who left a large number of questions blank or used only one or two points of the interval scale). As the previous analysis indicated, the data distribution was not adherent to the Gaussian curve, we chose the correlation matrix estimation using Partial Least Squares Structural Equation Modeling (PLS-SEM), whose data were analyzed using the software SmartPLS (v 3.2.6). For the descriptive analysis step, the software Microsoft Excel and IBM SPSS were used.

4 ANALYSIS OF RESULTS

4.1 PROFILE OF RESPONDENTS

We found a sample balance in the respondents regarding sex, although males were more (52.03%/n=295) than the female respondents (47.97%/n=272).

All respondents reported their ages and there are respondents ranging from 17 to 60 years old. Most of the sample is found in respondents up to 20 years of age (53.26%/n=302), followed by individuals aged between 21 and 30 years (41.98%/n=238), 31 to 40 years (3.17%/n=18), from 41 to 50 years old (1.24%/n=7) and over 50 years old (0.35%/n= 2).

Most respondents are in undergraduate studies (90.12%/n=511), while a portion of the sample have graduated (5.11%/n=29). Others have a full postgraduate course (2.47%/n=14), a complete secondary level (1.24%/n=7) and others have a postgraduate degree (1.06%/n=6).

Regarding the respondents' income, the predominant stratum, according to the Brazilian Association of Research Companies - BARC (Associação Brasileira das Empresas de Pesquisa - ABEP) classification was B2, individuals with monthly income from R\$4,852.00 to R\$9,254.00 (31.92%/n=181). Individuals were noted who represent the C1 strata (24.16%/n=138).
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n=137) with income of R\$2,705.00 to R \$4,852.00 and B1 (16.40%/n=93), of R\$9,254.00 to R\$20,888.00.

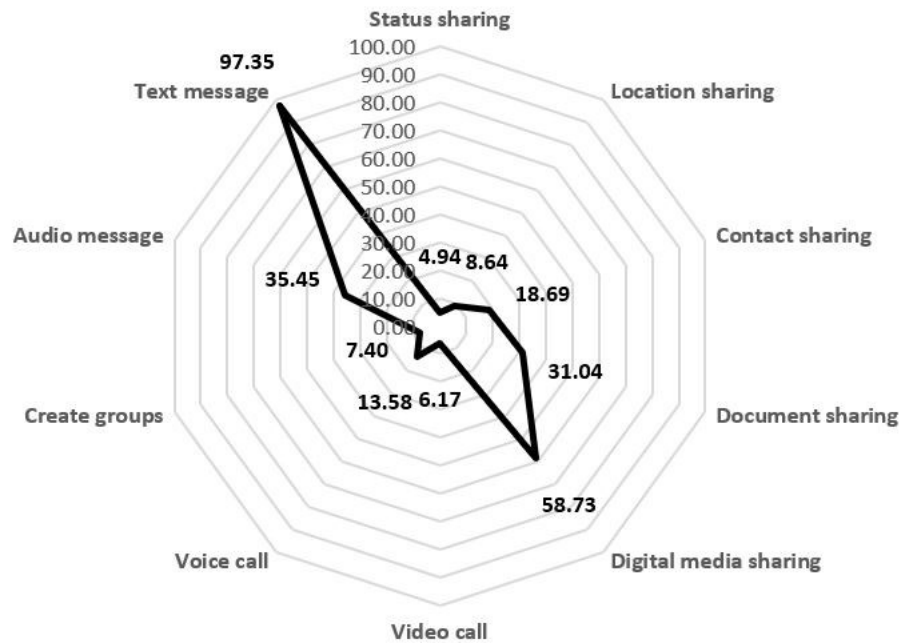
The majority of respondents used WhatsApp Messenger for two to five hours a day (28.92%/n=164), followed by those who used it for one to two hours a day (25.93%/n=147). Both those who use the application for five to eight hours a day and for more than eight hours a day are depicted with 18.52%/n=105. Finally, 46 respondents use WhatsApp Messenger for less than one hour per day (8.11%/n=46). In addition, it is possible to verify, in Figure 2, the frequency of use of the main functionalities of the application.

Most respondents are WhatsApp Messenger users for approximately two to five years (68.43%/n=388), followed by users who have used the program for approximately five to nine years (28.04%/n=159); it is important to note that the messenger was released 9 years ago. There are 17 respondents who have used the application for one to two years (3.00%/n=17) and three have been using it for six months to one year (0.53%/n=3).

We identified that, even with the options of the most used smartphone operating systems (Android, iOS, BlackBerry, Symbian, Windows Phone and Bada), only three of were identified as being used by the respondents. Android is the most used (63.49%/n=360), iOS is the second most used (35.63%/n=202), while a small number of respondents use Windows Phone operating system (0.88%/n=5). The other mobile operating systems, BlackBerry, Symbian and Bada, were not mentioned by the respondents, representing 0% of the sample. It was observed that 99.47% (n=564) of respondents use the WhatsApp Messenger on smartphones, 3.35% (n=19) access via a tablet, 45.85% (n=260) use a notebook computer, 24.86% (n=141) access through a PC, and 1.94% (n=11) use the application on Wearable Technology devices.

We inquired as to which WhatsApp Messenger competitors are used by the respondents. We found that 87.12%/n=494 use Facebook Messenger, 59.96%/n=340 of respondents use Skype, 12.69%/n=72 use Hangouts, 12.52%/n=71 use Telegram, 0.52%/n=3 use ICQ, 0.17% / n=1 use ZapZap, 1.41%/n=8 use Line, 1.23%/n=7 use WeChat, 1.41%/n=8 use Kik Messenger, and 3.88%/n=22 use Viber. In relation to the number of respondents who know of the competing platforms, the number of those who use them is much smaller.

Figure 2 - Functionalities of the application



Source: the authors

4.2 MULTIVARIATE PHASE: ASSUMPTIONS, ESTIMATION AND ANALYSIS OF THE STRUCTURAL MODEL

We verified the normality of the data by the test Kolmogorov-Smirnov (K-S) and the respective p-value of each variable. This procedure was necessary to limit the possibility of using techniques of statistical analysis that have as characteristics the normal distribution of the data. All the individual p-values of the K-S test for the indicators were very significant, with $p < .01$ as presented in Appendix A (HAIR et al., 2017).

4.3 ANALYSIS OF THE STRUCTURAL MODEL

The results of the factorial loads obtained by each of the latent variables presented values above 0.5, so it was not necessary to make any exclusion of variables for the convergent validity adjustment (Cronbach's Alpha, Composite Reliability and Average Extracted Variance) of the model.

Convergent validity demonstrates the extent to which the latent variable correlates with the items chosen to measure that variable. Discriminant validity involves the correlation

between model constructs and a theoretical model (BAGOZZI; YI; PHILLIPS, 1991). In the convergent validity, the variances of the extracted averages (AVE) and the quadratic correlations between the constructs, the convergent validity, and the composite reliability, were presented in Table 1.

Table 1 - Convergent Validity

Indicators	Cronbach's Alpha >0.60	Composite Reliability >0.70	Average Variance Extracted (AVE) >0.50	R ²	Q ²	f ²	Items
Service Compability	.615	.792	.564		.000	.194	3
User Control	.610	.752	.504		.000	.058	3
Mobile Convenience	.671	.805	.592		.000	.020	3
Intention to Continue Using	.704	.834	.626	.505	.266	.268	3
Hedonic Needs	.652	.808	.588		.000	.000	3
Perceived Needs	.685	.809	.516	.575	.249	.420	4
Social Needs	.673	.773	.535		.000	.013	3
Utilitarian Needs	.719	.841	.638		.000	.040	3
Privacy	.689	.828	.616		.000	.073	3
Satisfaction	.641	.807	.582	.428	.213	.420	3

Source: the authors

Evaluation of the measurement models involves composite reliability, convergent validity, indicator reliability, discriminant validity and collinearity among the indicators. The evaluation of the structural model involves the determination coefficients (R²).

Cronbach's Alphas coefficients ranged from .610 to .719, with values above .60 considered adequate. This median result indicates that the internal consistency of the scales used needs to be improved. However, the result does not invalidate the present study, since the coefficient is sensitive to the sample size. The study imported the Privacy construct, whose scale was adapted to the reality of Mobile Instant Messengers. Scales in preliminary developmental stages do not generally have the same internal consistency as others that are currently in use. Cronbach's Alpha tends to underestimate the reliability of internal consistency, which makes the composite reliability indicator more suitable to verify the internal scale consistency (PETERSON, 1994). The composite reliabilities obtained in this study varied between .752 and .841, indicating the results were satisfactory in this sense.

For this model, AVEs ranged between .504 and .638. The criteria of Fornell and Larcker (1981) were used, which is AVE values should be greater than .50. In this sense, all

the latent variables presented mean variance extracted greater than 50%, which reaches the criteria of Chin (1998) to indicate the existence of convergent validity. The Q^2 evaluates how much the model approaches what was expected of it (or the quality of the prediction of the model or accuracy of the adjusted model), since in the evaluation criteria values greater than zero should be obtained (HAIR et al., 2017). A perfect model would have $Q^2 = 1$ (shows that the model reflects reality - no errors), and the criterion for good accuracy is $Q^2 > 0$.

According to the criterion used to evaluate the accuracy of the adjusted model, Q^2 , the constructs Intention to Continue Using, Perceived Needs and Satisfaction showed adequate accuracy, since they presented values greater than zero. The constructs Service Compatibility, Control of User, Mobile Convenience, Hedonic Needs, Social Needs, Utilitarian Needs and Privacy presented with zero value. It is a model that holds both management variables and variables of personality traits, which causes some values of Q^2 to be impaired by this characteristic.

Goodness of Fit (GoF) is the global fit measure, that is, the square root of the multiplication of both AVE and R^2 means of endogenous variables. The goal of GoF is to account for the model study at both levels, i.e. measuring the structural model with a focus on overall model performance. The GoF criteria for determining whether GoF values are not adequate (less than .1), small (.1 to .25), mean (.25 to .36) or large (greater than .36) given by (WETZELS; ODEKERKEN-SCHRÖDER; VAN OPPEN, 2009). In the case of this research, the GoF found value of .538, therefore, is considered sufficiently large for the validity of the model in the PLS.

The discriminant validity evaluated the items that reflect the factor, or that are correlated with other factors. In this study, the mean variances extracted were greater than or equal to the square of the correlation between the factors, as presented in Table 2, with the definitive Fornell-Larcker criterion with all factorial loads of each indicator with values above .5.

Table 2: Discriminant Validity: Fornell-Larcker's Criterion

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
(1) Service Compatibility	.751									
(2) User Control	.595	.710								
(3) Mobile Convenience	.250	.275	.769							
(4) Intention to Continue Using	.587	.552	.373	.791						
(5) Hedonic Needs	.381	.430	.257	.414	.767					
(6) Perceived Needs	.678	.628	.307	.574	.357	.718				
(7) Social Needs	.534	.584	.188	.492	.416	.536	.732			
(8) Utilitarian Needs	.495	.537	.197	.448	.274	.544	.491	.799		
(9) Privacy	.343	.408	.666	.416	.323	.395	.254	.260	.785	
(10) Satisfaction	.634	.626	.315	.674	.604	.621	.547	.417	.433	.763

Note: the highlighted diagonal shows the square roots of the AVE

Source: the authors

The path model in the structural equations consists of two elements: the internal model, in which the relationships between the constructs are displayed, and the measurement model, which shows the relationships between the constructs and the indicators. Thus, the measures allow for comparison between the structural models with the reality theoretically established, that is, how well the theory is adjusted to the data (HAIR et al., 2017). The construction of the measurement model also involved the validation of the constructs, based on the verification of reliability and significance among the variables, through the confirmatory factor analysis, according to the final model obtained in this study.

The model proposed in this research was estimated using the bootstrapping technique, comparing the original sample with the samples generated by this technique. The significance analysis of the paths can be verified from the t-values and factor loads of the observable variables. These values are interpreted below and presented in Table 3.

Table 3: Analysis of the significance of the paths

Direct Effects – Path	(β)	Bootstrapping 1000	SE	Test t	P Values	Sig.
H _{1a} – Utilitarian Needs -> Perceived Needs	.164	.163	.037	4.496	.000	*
H _{1b} – Hedonic Needs -> Perceived Needs	.003	.004	.034	.084	.933	N.S.
H _{1c} – Social Needs -> Perceived Needs	.099	.097	.038	2.576	.010	**
H _{2a} – Mobile Convenience -> Perceived Needs	.097	.096	.029	3.304	.001	**
H _{2b} – Service Compatibility -> Perceived Needs	.385	.383	.039	9.771	.000	*
H _{2c} – User Control -> Perceived Needs	.225	.229	.039	5.754	.000	*
H ₃ – Perceived Needs -> Intention to Continue Using	.228	.227	.044	5.238	.000	*
H ₄ – Perceived Needs -> Satisfaction	.534	.536	.035	15.278	.000	*

H ₅ – Satisfaction -> -> Intention to Continue Using	.482	.483	.043	11.133	.000	*
H ₆ – Privacy -> -> Intention to Continue Using	.118	.119	.034	3.517	.000	*
H ₇ – Privacy -> Satisfaction	.222	.222	.034	6.464	.000	*

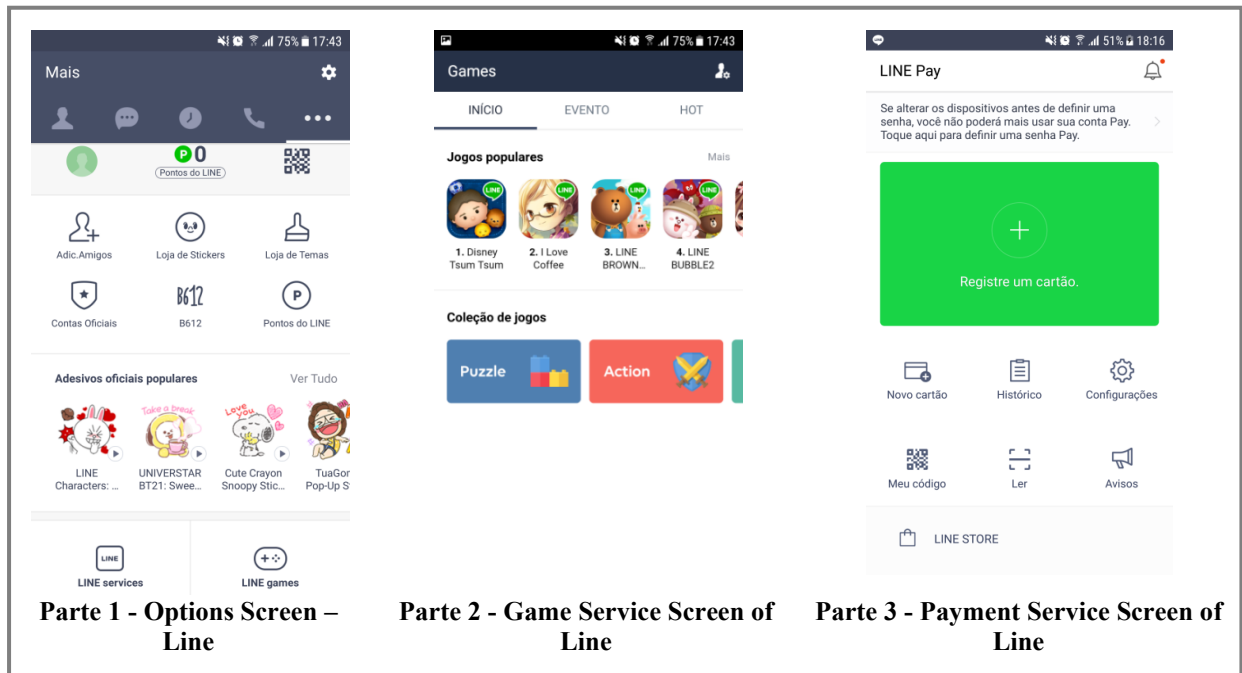
Note - Significance: * p <0.01, ** p <0.05; N.S., non-significant

Source: the authors

Hypothesis H1a, described in the causal relation of the path of the Utility Needs and Perceived Needs, was accepted, since the result found in the analysis was compatible with the study by Lin (2016), which suggests that utilitarian needs affect perceived needs. In general, people who have (utilitarian) task and information needs are aware of their needs (KATZ; BLUMLER; GUREVITCH, 1974, KO; CHO; ROBERTS, 2005, STAFFORD; STAFFORD; SCHKADE, 2004). The age of the respondents also influenced the marked importance of this characteristic, since 95.24% are under 30 years old. Young people use WhatsApp Messenger for a need to obtain information and clearly perform tasks, which makes them realize their need.

In the case of hypothesis H1b, with the Hedonic Needs and Perceived Needs path, with original load $\beta=.003$ and test $t=.084$, the hypothesis was rejected due to $p > 5\%$. In the study by Lin (2016), the relationship between hedonic needs and perceived needs was not confirmed, and the respondents' age may have influenced the marked importance of this characteristic, since 53.26% are under 20 years old. Individual consumer differences lead them to different perceptions of each product, according to their experiences of living, such as their education and the values present in their life during growth (HIRSCHMAN; HOLBROOK, 1982). Another explanation may be related to the fact that the WhatsApp Messenger and the Line, application studied by Lin (2016), present different utilities, although they are both MIMs. The Line application holds tools that can be considered more hedonic, such as games. Utility needs are linked to consumers' desire to solve basic day-to-day issues (HIRSCHMAN; HOLBROOK, 1982, WESTBROOK, 1987). Hedonic and utilitarian motivations predict certain consumer behaviors in the context of commitment (O'BRIEN, 2010).

Figure 3 – Line features



Source: the authors.

In addition to the different age groups of the two surveys, we can also highlight the application of the same research instrument in two countries (Taiwan and Brazil) with different cultures. We note that Eastern European applications tend to have a number of embedded functionalities (i.e. games or bank transactions in communication applications) that are not part of the original scope or main purpose of use for the tool. These applications enable users to spend as much time as possible on their platforms, consuming their partners' ads and advertisements and driving profit to the application. This favors Line users, in addition to using the tools for communication, also to develop playful gamification activities, as shown in Figures 3, 4 and 5. Within this perspective, these other functions can draw attention to the communication tool and entertain people with other activities.

Mobile applications are adding a variety of features and services to communication applications (KAMBIL; NUNES; WILSON, 2000), so users spend most of their time online interacting, which leads to a change in interpersonal relationships due to the intensive use of networks (KOZINETS et al., 2010, KATONA; ZUBCSEK; SARVARY, 2011).

However, even though they were present, hedonic needs were not perceived by users of WhatsApp Messenger, due to the focus of the use of the application to be

utilitarian, entirely focused on the need to communicate. The intention to use results from a previous experience with a social network and belief that it should present similar functionalities and generate a gratifying, intuitive and user-friendly experience, from which the success of the novelty will arise (HOEFFLER, 2003, MUKHERJEE; HOYER, 2001). Nevertheless, it allows for a new form of loyalty and proximity to consumers, since companies can create groups or speak directly with their customers.

Hypothesis H1c described in the causal relation of the path Social Needs and Perceived Needs, was accepted. Described by Lin (2016), this hypothesis represents the individual's search for social relations, through interaction with other individuals, and perception of this need. Again, the low age of the respondents positively influenced the result, given the fact that new generations are born in an online environment, which makes them natural users who find MIMs as desirable solutions to socialization needs. Hypothesis H2a, described in the causal relation of the Mobile Convenience path and Perceived Needs, was accepted, since the relationship described in the Lin (2016) model is of great relevance, since the possibility of using the application in real time, and anywhere, directly affects users' perception of need (LIN; LU, 2015).

Regarding hypothesis H2b, described in the causal relation of the path Service Compatibility and Perceived Needs, the affirmative was accepted, and this reaffirms Lin's (2016) hypothesis. It is noted that the added value of the service offered by MIMs is compatible with the need for service perceived by users.

Hypothesis H2c, described in the causal relation of the User Control path and Perceived Needs, was accepted. Lin (2016) describes user control as the MIM's usage complexity. In this case, the interaction becomes more attractive when it is easy and pleasant, giving the user the feeling of dominion over the technology (KLEIJNEN; RUYTER; WETZELS, 2007; Lin and Lu, 2015). That is, this aspect is strategic to make the interface of technologies more humanized and intuitive for the user.

Hypothesis H3, described in the causal relation of the path Perceived Needs and Intention to Continue Using, the hypothesis was also accepted. Thus, when users perceive a good fit between their needs and the technological characteristics of the MIMs, their

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intention to continue using technology increases (IP; WAGNER, 2008, LIN, 2012, YEN et al., 2010).

The hypothesis H4, described in the causal relation of the path Perceived Needs and Satisfaction, was accepted, since it confirms the hypothesis of Lin (2016): when perceiving a good fit between the information needs and the technological characteristics provided by the MIMs, users' satisfaction increases.

Hypothesis H5, described in the causal relation of the path of Satisfaction and Intention to Continue Using, was accepted. Lin (2016) describes in his model satisfaction as a factor of positive user feelings by the functions of the MIM, which, consequently, generates the intention to continue using the communicator with which one is satisfied, corroborating Lin (2012), Oghuma et al. (2016) and Yu et al. (2013).

Also, hypothesis H6, described in the causal relation of the path of Privacy and Intention to Continue Using, was accepted, since the relation between privacy and the intention to continue using it becomes clear. The user who feels secure and perceives that their privacy is not violated has the intention of continuity of use (WU; TSANG, 2008). In the case of WhatsApp Messenger, the application has an ecosystemic policy by Facebook, which allows greater control of information and exchanges of information among users.

With regard to the hypothesis H7, described in the causal relation of the path Privacy and Satisfaction, the hypothesis was accepted, since, while the user uses the MIM tools, he / she knows all the functionalities better and feels protected and safe within the online environment. This phenomenon occurs because the user believes they have control over their own data and are satisfied with their use (LIAO; HUANG; HSIEH, 2015).

4.4 ANALYSIS OF MEDIATIONS

For the analysis of the mediations in this study, we noticed that the two mediations observed between the constructs were significant, indicating partial mediations. The satisfaction construct is implicit, so that if the individual uses WhatsApp Messenger, it is because he treats it as a basic need item and the lack of the application generates no satisfaction.

5 CONCLUSIONS

The goal in this work was to propose a model developed to measure the intention of users to continue using WhatsApp Messenger. Thus, we used the following constructs: Utility Needs, Hedonic Needs, Social Needs, Mobile Convenience, Service Compatibility, User Control, Perceived Needs, Continued Usage Satisfaction and Intent, extracted from the Lin model (2016), and Privacy, adapted from the studies of Malhotra, Kim and Agarwal (2004) to the reality of the MIMs.

The model is valid, since eleven of the hypotheses raised in this study obtained significant results, with $p < .01$, indicating great statistical relevance in the causal relations tested. However, the hypothesis that hedonic motivational needs positively influence the needs perceived by users was rejected. One explanation for this fact is that the respondents of this research are mostly in a young age group (under 30 years). Therefore, these young users have a different perception of the pleasure needs linked to a communication application, which does not provide games or other fun activities in their functionalities. These users are only attentive to the communication functionalities that, per se, are not hedonic needs, but rather utilitarian and socializing.

In this sense, the highest observed β (.534) was the causal relation between Perceived Needs and Satisfaction, confirming that the perception of users' needs precedes their satisfaction. With regard to constructs directly linked to the intention to continue using, a high β (.482) was found in the causal relationship between Satisfaction and Intention to Continue Using. On the other hand, the lower β (.099) and β (.097) signifiers were obtained, respectively, in the causal relations Social Needs and Perceived Needs, and Mobile Convenience and Perceived Needs.

The different age range of the target audiences of the two surveys, the cultural differences between the two countries (Taiwan and Brazil), the tendency to have functionalities beyond the communication of Eastern countries' applications (i.e. games and payments) and the paradox of "freedom and control" have led to some divergences in the results of the two studies. We observed that the hedonic and utilitarian features make the user stay online for a longer time on the platform. The application captures the attention of

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the user and causes them to consume the ads and advertisements of their partners, to generate profit for the application. Line users, in addition to using the tools for communication, also develop recreational gamification activities. This takes attention away from communication features and makes people entertained with other activities.

We realize that while Line has more control, keeping the user online in the application longer, it also allows users to experiment with hedonic interaction. On the other hand, WhatsApp Messenger, which allows greater freedom for the characteristics of its features, which allow free sharing of information between users and is exclusively for communication, forcing the user to access other platforms to play or watch a movie. Thus, WhatsApp Messenger does not provide the hedonic part. In future studies, the scale of hedonic functionality used in this research, the same as Lin (2016), can be refined and adjusted for the more specific measurement of technological hedonism.

5.1 MANAGERIAL RECOMMENDATIONS

For managerial recommendations, this research results highlight the importance of Mobile Instant Messengers and how much they have been modifying the forms of communication between individuals. The use of these applications has been increasing in recent years, making WhatsApp Messenger the most widely used mobile application in Brazil and in many other countries around the world. WhatsApp Messenger can be an excellent platform for customer relationships. Even if it does not allow advertisements, it allows a new form of loyalty and proximity to consumers, as companies can create groups or talk directly with their customers to promote products, promotions, provide information and receive complaints, and meet the needs of users.

The privacy of WhatsApp Messenger users is more flexible and depends directly on the provision of information by the user, which brings, for some, the need or desire to be constantly updated. In this way, the experience can be extended, creating a greater proximity between the users themselves, and between the users and the companies. This fact can generate an improvement in the relations of the businesses and the own brand.

5.2 LIMITATIONS OF THE RESEARCH

Regarding the limitations of the research, although the findings of this study are of admissible applicability to mobile application users, specifically WhatsApp Messenger, it is necessary to highlight the limits of the research: the sample was non-probabilistic and convenience type, composed in most of them by university students. However, considering the characteristics of the study, and the application that was analyzed, it is possible to state that the conclusions reached here could be extended to the entire population, or even to a specific target audience. Thus, we hope that this study, which included the choice of the most popular application in Brazil in relation to its basic communication features, contributed to the advancement of the discussions on the subject.

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APPENDIX A - Identifying constructs and model items

Latent variable	Items	Assertives	Mean	Standard Deviation	Test K-S	Sig.	VIF	Reference
Utilitarian Needs	UN01	WhatsApp allows me to solve school problems or work anywhere.	4.42	.740	7.713	.000	1.410	Adapted from Lin (2016)
	UN02	WhatsApp allows me to collect information to solve school or work problems.	4.19	.946	6.277	.000	1.365	
	UN03	WhatsApp allows me to acquire / deal with school or work information in real time.	4.34	.794	7.291	.000	1.472	
Hedonic Needs	HN01	Compared to other things I could have done, the time spent on WhatsApp was really enjoyable.	3.21	.977	4.624	.000	1.160	
	HN02	Using WhatsApp on my cell phone pleases me.	3.35	1.161	4.492	.000	1.389	
	HN03	When I use WhatsApp, I like the feeling of being immersed in the virtual environment.	2.99	1.159	4.280	.000	1.421	
Social Needs	SN01	WhatsApp allows me to develop new social relationships.	3.78	1.132	5.709	.000	1.152	
	SN02	WhatsApp allows me to maintain my social relationships.	4.24	.859	6.425	.000	1.293	
	SN03	WhatsApp allows me to pleasantly communicate with people.	4.58	.646	9.463	.000	1.170	
Mobile Convenience	MC01	Using WhatsApp is an efficient way to manage my time.	3.29	1.199	3.956	.000	1.496	
	MC02	Using WhatsApp is convenient for me.	2.80	1.259	4.251	.000	1.543	
	MC03	WhatsApp allows me to use the service on the go.	2.19	1.228	5.725	.000	1.159	
Services Compatibility	SC01	Using WhatsApp fits my functionality needs.	4.02	.915	5.812	.000	1.247	
	SC02	WhatsApp is compatible with the messaging service I normally use on different devices (smartphone, tablets, notebook, PC and watches).	4.28	.896	7.172	.000	1.163	
	SC03	WhatsApp fits my functionality preferences.	4.16	.836	5.712	.000	1.342	
User Control	UC01	Using WhatsApp is not complicated.	3.51	1.045	4.563	.000	1.108	
	UC02	Learning how to use social networking is easy for me.	4.46	.717	7.950	.000	1.130	
	UC03	Using the WhatsApp features in my work or course allows me to make many decisions myself.	4.07	1.064	6.009	.000	1.119	
Perceived Needs	PN01	WhatsApp functions are appropriate for my needs.	4.42	.766	7.970	.000	1.324	
	PN02	The WhatsApp functions are adequate to help me complete my needs.	3.93	.903	5.975	.000	1.449	
	PN03	The real-time WhatsApp functions are adequate.	3.84	.975	5.399	.000	1.180	
	PN04	In general, the WhatsApp functions	4.16	.898	5.914	.000	1.293	

ANALYSIS OF THE TASK-TECHNOLOGY FIT MODEL APPLIED TO WHATSAPP AS A PREFERENCE OF YOUNG USERS OF MOBILE INSTANT MESSENGERS

Luis Hernan Contreras Pinochet - Jéssica Priscilla dos Santos Badaró - Evandro Luiz Lopes - Eliane Herrero - Durval Lucas dos Santos Júnior

Latent variable	Items	Assertives	Mean	Standard Deviation	Test K-S	Sig.	VIF	Reference
		are enough to help me complete my needs.						
Satisfaction	SA01	I'm happy to use WhatsApp as a communication tool.	4.57	.741	9.543	.000	1.155	
	SA02	I like to use WhatsApp.	4.20	.863	6.407	.000	1.452	
	SA03	Using WhatsApp makes me very satisfied	3.64	1.004	5.823	.000	1.361	
Privacy	PRI01	WhatsApp only asks for relevant information.	3.25	1.096	5.059	.000	1.308	Adapted from Malhotra, Kim and Agarwal (2004)
	PRI02	WhatsApp uses appropriate methods to collect my data.	3.20	1.090	5.290	.000	1.379	
	PRI03	The information I provide to WhatsApp is well protected.	2.79	1.172	4.558	.000	1.338	
Intention to Continue Using	ICU01	I intend to use WhatsApp continuously.	4.43	.824	8.499	.000	1.522	Adapted from Lin (2016)
	ICU02	It is possible that I will continually use WhatsApp in the future.	4.25	.888	6.928	.000	1.454	
	ICU03	I will recommend my friends use WhatsApp.	4.18	.987	6.797	.000	1.261	

Source: the authors