

Rožman, Maja; Oreški, Dijana; Tominc, Polona

## Article

# A pilot study of some aspects of the perceived usability of mobile advertising among students

Naše gospodarstvo / Our Economy

### Provided in Cooperation with:

Faculty of Economics and Business, University of Maribor

*Suggested Citation:* Rožman, Maja; Oreški, Dijana; Tominc, Polona (2022) : A pilot study of some aspects of the perceived usability of mobile advertising among students, Naše gospodarstvo / Our Economy, ISSN 2385-8052, Sciendo, Warsaw, Vol. 68, Iss. 3, pp. 50-60, <https://doi.org/10.2478/ngoe-2022-0017>

This Version is available at:

<https://hdl.handle.net/10419/290524>

#### Standard-Nutzungsbedingungen:

Die Dokumente auf EconStor dürfen zu eigenen wissenschaftlichen Zwecken und zum Privatgebrauch gespeichert und kopiert werden.

Sie dürfen die Dokumente nicht für öffentliche oder kommerzielle Zwecke vervielfältigen, öffentlich ausstellen, öffentlich zugänglich machen, vertreiben oder anderweitig nutzen.

Sofern die Verfasser die Dokumente unter Open-Content-Lizenzen (insbesondere CC-Lizenzen) zur Verfügung gestellt haben sollten, gelten abweichend von diesen Nutzungsbedingungen die in der dort genannten Lizenz gewährten Nutzungsrechte.

#### Terms of use:

*Documents in EconStor may be saved and copied for your personal and scholarly purposes.*

*You are not to copy documents for public or commercial purposes, to exhibit the documents publicly, to make them publicly available on the internet, or to distribute or otherwise use the documents in public.*

*If the documents have been made available under an Open Content Licence (especially Creative Commons Licences), you may exercise further usage rights as specified in the indicated licence.*



<https://creativecommons.org/licenses/by-nc-nd/4.0/>

# A Pilot Study of Some Aspects of the Perceived Usability of Mobile Advertising Among Students

Maja Rožman<sup>a</sup>, Dijana Oreški<sup>b</sup>, Polona Tominc<sup>c</sup>

<sup>a</sup>University of Maribor, Faculty of Economics and Business, Maribor, Slovenia

<sup>b</sup>University of Zagreb, Faculty of Organization and Informatics, Varaždin, Croatia

<sup>c</sup>University of Maribor, Faculty of Economics and Business, Maribor, Slovenia

maja.rozman1@um.si, dijana.oreski@foi.unizg.hr, polona.tominc@um.si

## ARTICLE INFO

### Original Scientific Article

#### Article History:

Received June 2022

Revised August 2022

Accepted August 2022

#### JEL Classification:

A20

J10

#### Keywords:

Mobile advertising

Pilot study

Students

Younger generation

UDK: 659.1:621.395.721.5-057.87

DOI: 10.2478/ngoe-2022-0017

Cite this article as: Rožman, M., Oreški, D., & Tominc, P. (2022). A Pilot Study of Some Aspects of the Perceived Usability of Mobile Advertising Among Students. *Naše Gospodarstvo/Our Economy*, 68(3), 50-60. DOI: 10.2478/ngoe-2022-0017.

©2022 The Authors. Published by Sciendo on behalf of University of Maribor, Faculty of Economics and Business, Slovenia. This is an open access article under the CC BY-NC-ND license (<http://creativecommons.org/licenses/by-nc-nd/4.0/>).

## Abstract

The pilot research is often intended to gather preliminary information and is usually based on a small set of observations to help decide how to conduct a more extensive study. The present pilot study is intended to provide preliminary results regarding various aspects of mobile advertising perceptions for young people. The objective of this pilot study is also to conduct the initial analysis of the relationships and impact of predecessors (influencing factors) on the attitudes towards mobile advertising and further on the perceived usefulness of mobile advertising among young people. Results show that the objectives of the pilot study have been fulfilled. They are crucial for continuing the main research on the importance of factors affecting the positive perception of the usefulness of mobile advertising among students and for designers of communication channels for the younger generation.

## Introduction

Mobile phones are an indispensable "physical part" of most of the population between the ages of 18 and 25 years – data shows that the number of smartphone users exceeds 6 billion in 2022, with an expected growth to over 7.5 billion users in 2027 (Statista, 2022). Additionally, over 93% of those aged 18-24 in 2017 possessed a smartphone, compared to 67% of those of age 55 plus (Deloitte, 2017). Therefore, it is understandable that various aspects of the perception of mobile advertising are important information when planning to communicate with the student generation, that includes mobile advertising. The Mobile Marketing Association (2022) defines mobile marketing as a wider concept as follows: "A set of practices that enable organizations to communicate and engage with their audience in an interactive and relevant manner through any mobile device or network." In this context, the perceived usability of mobile advertising is among the main research focus of several research studies (Ducoffe, 1995; Qin & Yan, 2017; Liu et al., 2012; Murillo-Zegarra, 2020). To attract new subscribers as well as retain current customers, mobile service carriers need to understand the driving force behind consumers' perceived value, satisfaction, and loyalty to the use of mobile services.

Age has been of significant interest to social psychologists and marketers in the past (Kushwaha & Agrawal, 2016). In their study, Kumar and Lim (2008) compare Generation Y and baby boomers in terms of their mobile service perceptions and loyalty intentions. Generation Y (generation Y consumers were born between 1980 and 1994) presents the younger consumers, while baby boomers (those born between 1946 and 1964) give the older group of mobile service consumers. The differences in these two consumer groups' lifestyles and technology diffusion can cause significant differences in their satisfaction and loyalty decisions. Thus, Kumar and Lim (2008) found out that perceived emotional value had a more significant effect on satisfaction for Generation Y than for baby boomers and perceived economic value had a greater effect on satisfaction for baby boomers than for Generation Y. In connection with the findings, Ito and Okabe (2006) found that young consumers use mobile services more for emotional benefit and social communication than for an instrumental purpose. Moreover, research has shown that the younger generation tends to be emotionally attached to their mobile phones. Thus, it is logical to assume that Generation Y will hold a more significant emotional value toward their mobile phones and services than baby boomers. On the other hand, baby boomers perceive a helpful benefit from mobile services. Baby boomers are also inherently price-conscious compared to any other generation (Zhang et al., 2017).

In addition, Generation Y is essential for marketers because of their impact on their families' purchase decisions (Florenthal, 2019). Generations Y are often early adopters of new technologies and are extensive internet users. As with the internet, Generations Y are substantial users of mobile services (Wong & Malone, 2016). Regarding mobile service usage, the age group of 15-24 owns a mobile phone. These users outnumber all other users in terms of minutes used, the number of calls placed, messages sent/received, and wireless data transmitted/received (Wut et al., 2021). Short message services (SMS) are also on the rise among Generation Y. A recent study indicates that most Generations Y communicate via SMS, with an average of 126 messages sent per month (Bolton et al., 2013). Though baby boomers are technologically advanced and may be comfortable using mobile phones, their intentions to use mobile services are vastly different from Generations Y. Baby boomers typically use mobile phones for making voice calls, but sparsely use data services such as SMS, mobile e-mails, and data downloads (Kumar & Lim, 2008). Considering technical service quality (i.e., data services and network quality), baby boomers use mobile phones and services mainly for communicating with family members, making emergency calls, and for business. The utilization of mobile data services appears to be limited among baby boomers. On the

other hand, Generations Y are heavy users of value-added mobile data services such as text messaging, online gaming, and downloading music. Many college-aged Generation Y consumers preferred using short-code text messages to maintain contact with families and peers. SMS advertising is a form of communication exchanges between the seller and the mobile phone user via short-code text messages (Keith, 2011). A recent marketing trend among clothing providers is sending SMS apparel advertisements to capture college-aged Generation Y consumers' attention (Koo et al., 2012).

The purpose of this paper is to present the preliminary results of a pilot study conducted among the undergraduate students in economics and business study program and to test the basic relationships between students' perceptions of ease of use of mobile devices and applications, perceived playfulness, and annoyance of mobile phone advertising on one hand, and attitudes as well as perceived usability of mobile advertising on the other hand.

Pilot research usually precedes a more extensive study and is intended to gather information on the possibilities of its implementation. It is usually based on a small set of observations to help decide how to carry out a larger study or project (Eldridge et al., 2016). In the case of our research, the pilot study is intended for (i) preliminary testing of relationships among constructs in the model and (ii) preliminary testing the measurement instruments for individual multidimensional variables. Although the measurement instruments of the constructs included in the research are known in the professional literature (Ducoffe, 1995; Haghirian & Inoue, 2007; Varnali et al., 2012, Murillo-Zegarra, 2020), we must not ignore the fact that perceptions, especially of young people, are changing rapidly. For example, what used to be a vital issue in online shopping - the security of your purchase - has a significantly different meaning today. Also, technological literacy, reflected in the perceptions of ease of use of mobile devices and apps, may be a less critical factor for the younger generation, in contrast to the older generation, as indicated by the statistical data below.

In marketing approaches, research has recently often focused on younger Generation Z. Research results show that both generations (Generations Y and Z) are very similar in using social media and risk aversion, which also indicates that directing similar promotional messages for both generations may be relevant. Still, the satisfaction with the online shopping experience among Generation Z is on average lower and grows with experience (Reisenwitz, 2021). Younger Generation Z is on average less brand loyal - a significant difference that mobile advertising may be able to address with appropriate mobile advertising approaches.

The present research is designed as pilot research that addresses some of the aspects in the perception of the usefulness of mobile advertising among members of generation Z (among students). Although the purpose of the paper is not to define a model of all (or as many as possible) influencing factors explaining the variance of the dependent variable – perceived usability of mobile advertising – we believe that this article provides an additional perspective on the possible importance of conducting pilot research, since pilot studies are less often the subject of scientific publications. However, they have an important place in the research process (Eldridge et al., 2016). The paper discusses and also provides new preliminary information on the relationship between perceived playfulness, annoyance, usability, and other multidimensional constructs, with the objective to ensure important information for the main research study about the antecedents of the attitudes and perceived usability of mobile advertising among young generations.

The paper is organized as follows: in chapter 2 the research model is presented, and the hypotheses are set based on the literature review. In chapter 3 methodological tools and sample are described. Chapter 4 brings the results, while chapter 5 concludes this pilot research.

## Literature Review

Although the pilot research is an important part of the research process, pilot research reports are not very often included in the research literature, but individual pilot research reports can be found in various fields of study, such as medicine (In, 2017), educational processes (Fraser et al., 2018) and others.

Regarding pilot research, there is no completely uniform definition, but for the purposes of this paper, we will use the following definition (Eldridge et al., 2016): while piloting is also concerned with whether something can be done and whether and how we should proceed with it, it has a further dimension – namely, piloting is implementing something, or part of something, in a way you intend to do it in the future to see if it can be done in practice.

Pilot studies are often conducted for this purpose, namely, to test the methods and techniques or individual measuring instruments of the survey and the questionnaire as a whole (Doody and Doody, 2015). In this way, deficiencies can be remedied, research design and the quality of data obtained improved (Beebe, 2007), also by adapting and improving the measurement instruments themselves (Conn et al., 2010). In this way, a pilot study helps to reduce difficulties in data

collection, management, and analysis (Moore et al., 2011).

The present pilot study is intended to study various aspects of mobile advertising perceptions for young people with the objective to preliminarily check the measurement instruments of multidimensional variables included in the model, as already mentioned in the introduction. The objective of this pilot study is also to conduct the preliminary analysis of the relationships and impact of predecessors (influencing factors) on the attitudes towards mobile advertising and further on the perceived usefulness of mobile advertising among young people – all these with the purpose to provide additional information for conducting the future research.

The fundamental focus of the research is the perceived usefulness of mobile advertising among students. In the Ducoffe's research model (Ducoffe, 1995), usability for the user is determined by the attitude that the user develops towards mobile advertising (advertising on a mobile device). For example, Lerner and Keltner (2000) argue that affective response is an automatic emotional reaction to stimulation. Advertisement-induced feelings, especially arousal, trigger cognitive processing, guide sequent perception, and lead to subjective judgment of advertisements. Positive advertisements provoke affirmative emotions, such as excitement and arousal (Faseur & Geuens, 2006). Thus, the consumer is likely to have a favorable perception of advertising. By contrast, anxiety, fear, and anger are negative emotions, which might contribute to the consumer's unfavorable perception (Faseur and Geuens, 2006; Law et al., 2012; Lerner and Keltner, 2000). The consumer's perception of advertising is an antecedent of behavior intention in consumption-related situations. Product awareness, brand attitude, and purchase intention are downstream behaviors associated with consumer affective response to advertisements (Hwang et al., 2011; Law et al., 2012). Thus, the hypothesis was formed:

*H1: Attitudes towards mobile advertising positively affect the perceived usefulness of mobile advertising by students.*

The attitude is negatively influenced by the perceived annoyances of mobile advertising and is positively influenced by the perceived playfulness of mobile advertisements. Playfulness refers to the ability to meet the needs of consumers for aesthetic pleasure or emotional relaxation (McQuail, 2010). According to some research, the sense of relaxation and enjoyment associated with advertisements plays the most significant role in shaping an individual's general attitude toward advertising (Kim & Han, 2014), due to the natural playfulness present in humans (Haghirian and Dickinger, 2004). The playfulness of mobile advertising influences the recipient to develop a more positive attitude toward advertising messages. The research results (Ducoffe,

1995) also suggest that the perceived ease of use of mobile devices reflects the perceived control over the emergence of mobile advertisements, thus positively influencing the attitudes towards mobile advertising. Consequently, entertaining commercial messages provoke a positive emotional response and arouse the consumer's interest in investigating the advertised content (Ducoffe & Curlo, 2000). Many college-aged Generation Y consumers expect to use mobile phones for personal communication and can become irritated by perceived irrelevant commercial messages (Amin et al., 2011; Muzaffar & Kamran, 2011). From the perspective of advertising values theory, perceived product value determines whether the consumer will respond favorably or not to advertisements (Wong & Malone, 2016). According to Jun and Lee (2007), when consumers are provided with benefits such as entertainment and information, they will perceive advertising in a more favorable light. In addition, SMS advertising is found to be attention-grabbing, a source of information, engaging, and interactive (Lee et al., 2006). On the other hand, in general, consumers have been found to have a negative attitude toward mobile advertising as they associate it with unsolicited messages and an invasion of privacy (Drossos et al., 2007). The following hypotheses were developed:

*H2: Students' perceived playfulness of mobile advertising positively affects the developed attitudes toward mobile advertising.*

*H3: Students' perceived annoyance with mobile advertising negatively affects the developed attitudes toward mobile advertising.*

*H4: Students' perceived ease of use of mobile devices and apps positively affects the developed attitudes toward mobile advertising.*

The research model with the hypotheses formed is presented in Figure 1.

## Methodology

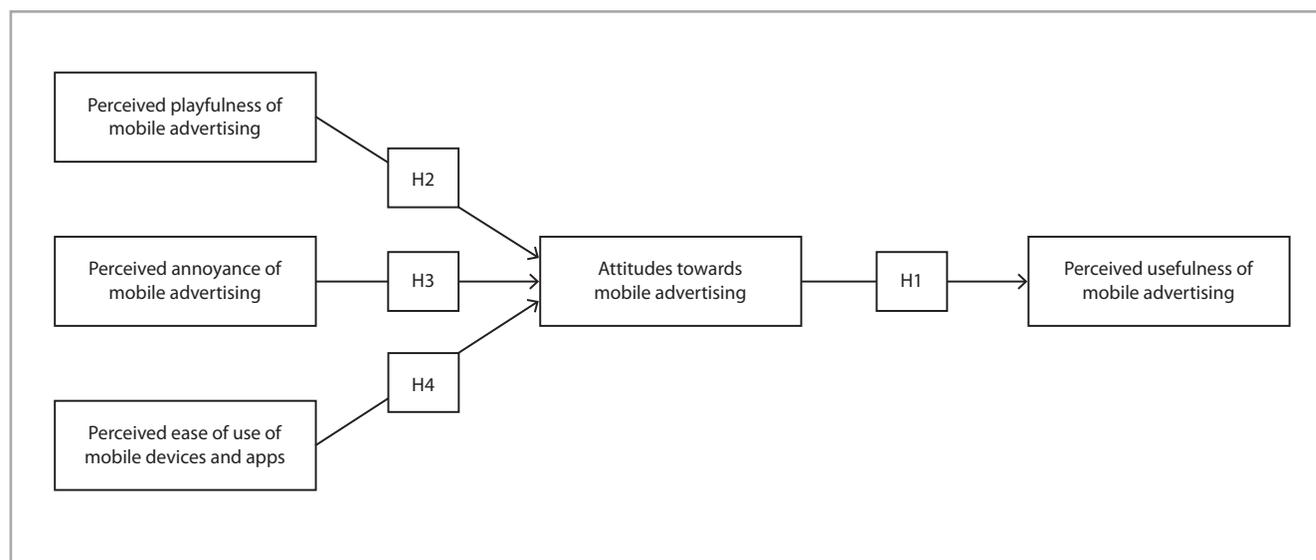
### Sample

The survey was conducted in the winter term of the study year 2019/2020 with students from the field of economics and business enrolling in the course of quantitative methods. The data were collected with an online questionnaire, with the link sent to students by e-mail. The study included a total of n = 37 undergraduate students. All online questionnaires were duly completed. Of the total sample, 36.8% were females, and 43.2% were males; 59.5% of students reside in rural areas and 40.5% in urban areas.

### Methodological tools

Factor analysis was used to form the multidimensional constructs of the model: the perceived ease of use of mobile devices and apps, the perceived playfulness, the perceived annoyance, attitudes towards mobile advertising and perceived usefulness of mobile advertising by students. The feasibility of using factor analysis is tested with the

**Figure 1**  
The research model



Source: Own model

Bartlett's test of sphericity, testing the null hypothesis that the correlation matrix of measured variables of individual constructs equals the unit matrix, meaning that there is no correlation between the observed (measured) variables. Rejecting the null hypothesis leads to the conclusion that factor analysis can be used. In addition to the Bartlett's test the Kaiser-Meyer-Olkin statistics (KMO) are also used; the use of factor analysis is justified at a KMO value greater than 0.5 (Tabachnick & Fidell, 2013).

The quantitative methodological tools used to test the hypotheses of the research model, presented by Figure 1, consists of the regression analysis, conducted in two steps, focused on two regression models – Model 1 includes simple regression for testing hypothesis H1. In contrast, Model 2 includes multiple regression testing hypotheses H2, H3, and H4. The 0.05 significance level was used, to determine the statistically significant impact of independent variables on the dependent variable of each regression model. The SPSS 24.0 was used for implementing the regression analysis.

## Results

The last two columns in Table 1 and Table 2 bring the descriptive statistics of the measured variables: the average degree of agreement (mean value) with each statement on the Likert scale from 1 - strongly disagree, up to 5 - strongly agree, and the standard deviation of the measured variable.

In Table 1, the middle three columns show the factor analysis results., performed separately for the perceived usefulness of mobile advertising and perceived attitudes toward mobile advertising. Factor loadings show the correlation coefficients between the measured variables and the newly formed factor (in both cases, a one-factor solution was obtained within the factor analysis). The percentage of explained variance of measured variables and the reliability of both measurement scales measured by Cronbach's alpha are shown in the third column, while the communalities show the square of factor loadings and define the variance of the measured variable (statement), explained by the newly formed factor. KMO statistics and Chi-square value are also presented, and in both constructs they confirm that the use of factor analysis is justified (both KMOs > 0.5, for Chi. square tests both  $p < 0.01$ ).

In the first set of statements related to the construct of the perceived usefulness of mobile advertising, students, on average, agree the most with the statement that mobile advertising protects the natural environment (PU2:  $M = 3.89$ ;  $SD = 0.843$ ) and the statement about the information

power of mobile advertising (PU4:  $M = 3.81$ ;  $SD = 0.776$ ). Factor analysis shows that the formed factor explains over 60% of the variance of measured variables; reliability is at a satisfactory level (Cronbach's alpha > 0.8), while communalities show that over 40% of each measured variable is explained by the factor obtained.

For the measured variables - statements in the second set, which refers to the multidimensional variable of attitudes towards mobile advertising, the agreement with the statements is, on average, slightly lower. Students expressed the highest average agreement by saying that mobile advertising is interesting (AT2:  $M = 3.41$ ;  $SD = 0.896$ ), and the lowest level of agreement by saying that they are willing to respond to a mobile advertisement when they receive it (AT4:  $M = 2.59$ ;  $SD = 0.985$ ). Similarly, over 60% of the variance of measured variables is explained by the factor obtained, with a bit weaker reliability than the perceived usefulness construct (Cronbach's alpha = 0.793). At the same time, communalities show that over 40% of each measured variable is explained by the factor obtained.

The three external constructs were obtained by factor analysis, which revealed the three factors solution, where constructs of perceived playfulness of mobile advertising, perceived annoyance of mobile advertising, and perceived ease of use of mobile devices and apps were formed, as presented by Table 2.

In the four-dimensional factor of perceived playfulness of mobile advertising, the average agreement is the highest with the statement reflecting the desired dynamism, liveliness, and interactivity of mobile ads for students (PP1:  $M = 3.59$ ;  $SD = 1.166$ ), while the lowest level of agreement can be observed at the statement that associates mobile ads with the students' free time (PP4:  $M = 2.92$ ;  $SD = 1.187$ ). It is true, however, that in this set of statements the standard deviations are, on average, the highest, which means that students differ more in their levels of agreement than in the other sets of statements. In the context of factor analysis, we find good reliability of the measurement scale (Cronbach's alpha = 0.855) and all communalities higher than 0.4.

The four-dimensional factor for the perceived annoyance of mobile ads shows the highest average level of agreement with the statement that many mobile phone ads are annoying (PA1:  $M = 4.51$ ,  $SD = 0.804$ ). The lowest moderate agreement is obtained for the statement that mobile ads are annoying because they are too long and incomprehensible (PA4:  $M = 3.68$ ,  $SD = 1.156$ ). In the factor analysis, the results show that the reliability of the measurement scale is slightly lower (Cronbach's alpha = 0.669). The percentage of explained variance of individual measured variables ranges

from 0.462 for PA2 to 0.702 for PA4.

As we have already indicated, the perceived ease of use of mobile devices and apps in today's times, especially among the younger generation, is something that we take for granted in the environment of developed countries. Average levels of agreement are above 4.5, for all three statements included, with standard deviations less than 1. The fact that there is minimal variability among students is also shown by the extremely high percentage of explained variance (more than 93%) and the high level of reliability (Cronbach's alpha = 0.94), as well as with communalities, all greater than or equal to 0.915.

The results of testing the model's hypotheses using both defined regression models are shown in Table 3 and Figure 2.

In the multiple regression model, we tested the defined impact of three influencing factors on the attitude toward mobile advertising among students (Hypotheses H2, H3 and H4). The independent variables included in the model explained 42.7% of the variance of the dependent variable (attitudes) ( $p < 0.01$ ). Of the three independent variables, our pilot study can only confirm the statistically significant positive impact of perceived mobile advertisements playfulness on students' attitudes towards mobile

advertising, while the impact of the perceived ease of use of mobile devices and apps and of the perceived mobile advertisements annoyance (where students highly agreed with individual statements/dimensions) do not show a statistically significant effect on the perceived usefulness of mobile advertisements by students.

In the simple regression model, where the attitude towards mobile advertising is an independent variable, and the perceived usefulness of mobile advertising is the dependent one, we tested hypothesis H1 that the attitude toward mobile advertising shows a statistically significant positive effect on the perceived usefulness of mobile advertising. The results confirm this influence, and we can conclude that 52% of the variance of the dependent variable ( $p < 0.01$ ), the perceived usability of mobile ads, is explained by the independent variable - students' attitudes towards mobile advertising.

## Conclusions

We can conclude that the objectives of the pilot study have been fulfilled. The pilot study addresses the questions regarding the research's feasibility and how to proceed with

**Table 1**

*The descriptive statistics of measured variables and factor analysis results for constructs PA - perceived attitudes towards mobile advertising and PU - perceived usefulness of mobile advertising*

Construct	Factor loadings	Variance explained / Cronbach's alpha	Communalities	Mean	Std. Deviation
<b>PU - Perceived usefulness of mobile advertising</b>					
PU1: Using a mobile ads helps me decide to buy additional services / products.	0.720	60.698 / 0.833	0.518	3.05	0.911
PU2: Mobile advertising protects the natural environment	0.673		0.452	3.89	0.843
PU3: I find the use of mobile ads useful	0.869		0.755	3.54	0.931
PU4: Mobile ads keep me informed	0.857		0.734	3.81	0.776
PU5: It's easier to get useful information through mobile ads	0.759		0.576	3.49	0.870
KMO = 0.762; Chi-square = 75.102, $p < 0.01$					
<b>AT - Attitudes towards mobile advertising</b>					
AT1: I have a positive attitude towards receiving mobile ads	0.913	61.859 / 0.793	0.834	3.19	1.076
AT2: Mobile advertising is interesting	0.684		0.468	3.41	0.896
AT3: When I get a mobile ad I read it	0.788		0.621	2.89	1.075
AT4: I'm ready to respond to a mobile ad	0.742		0.551	2.59	0.985
KMO = 0.671; Chi-square = 44.632, $p < 0.01$					

**Table 2**

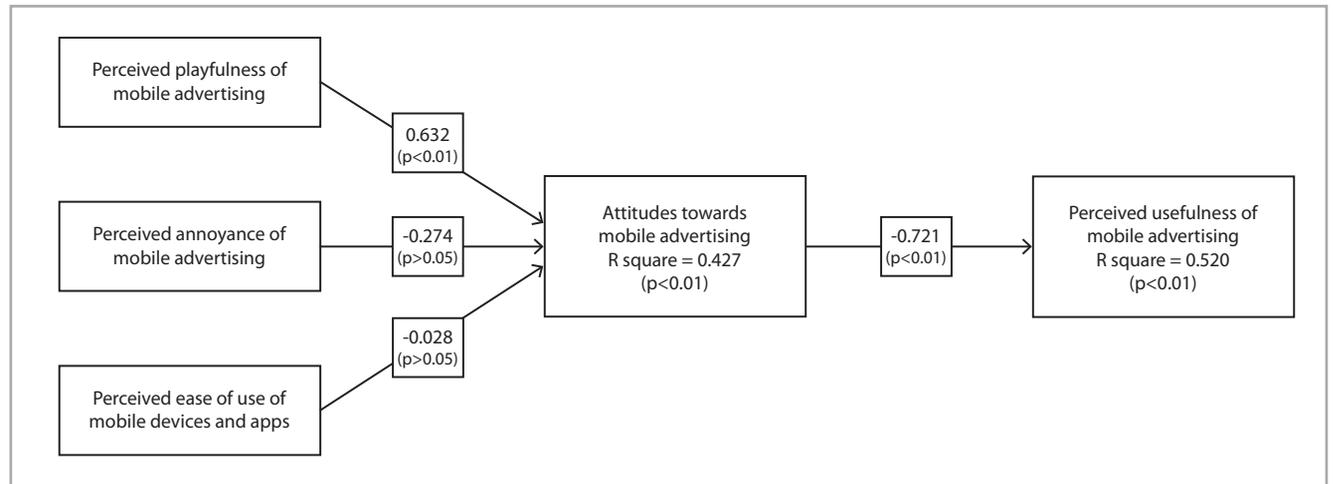
The descriptive statistics of measured variables and factor analysis results for constructs PP - perceived playfulness of mobile advertising, PA - perceived annoyance of mobile advertising and PE - perceived ease of use of mobile devices and apps

	Factor 1 Loadings PE	Factor 2 Loadings PP	Factor 3 Loadings PA	Cron's alpha	Communalities	Mean	Std. Dev.
PP1: If mobile ads, in addition to clicking and touching, also allow for new ways of interacting, such as: using a camera and microphone, etc., they amuse me	0.282	<b>0.664</b>	0.467	0.855	0.738	3.59	1.166
PP2: If mobile ads contain sound and music, they entertain me	0.007	<b>0.900</b>	-0.164		0.837	3.24	1.188
PP3: If mobile ads contain animations and / or videos, they entertain me	0.080	<b>0.944</b>	-0.052		0.901	3.32	1.226
PP4: Mobile ads are fun, especially in your free time	-0.038	<b>0.795</b>	-0.205		0.675	2.92	1.187
PA1: Too many advertising messages via mobile phone is annoying to me	0.365	-0.199	<b>0.663</b>	0.669	0.612	4.51	0.804
PA2: The constant appearance of mobile ads, despite their closure of them, is annoying to me	0.326	0.187	<b>0.566</b>		0.462	4.49	0.901
PA3: Improper timing of receiving advertising messages bothers me	0.464	-0.282	<b>0.472</b>		0.518	4.35	0.824
PA4: Mobile ads are annoying because they are too long and incomprehensible	-0.054	-0.206	<b>0.810</b>		0.702	3.68	1.156
PE1: My level of knowledge about using mobile telephony meets my current needs	<b>0.936</b>	0.083	0.141	0.940	0.903	4.62	0.924
PE2: I can easily install or update my mobile operating system (Android, iOS)	<b>0.961</b>	0.084	0.130		0.948	4.70	0.958
PE3: Downloading/updating apps is no problem for me	<b>0.921</b>	0.077	0.224		0.904	4.81	0.915
	KMO = 0.746; Chi-square = 276.928, p<0.01 Variance explained: 70.39 %						

**Table 3**

The regression analysis results – results of hypotheses testing

Hypothesis	R square	Regression coefficient	p-value	Result
H1: Attitudes towards mobile advertising positively affect the perceived usefulness of mobile advertising by students.	0.520	0.721	p<0.01	confirmed
H2: Students' perceived playfulness of mobile advertising positively affects the developed attitudes towards mobile advertising.	0.427	0.632	p<0.01	confirmed
H3: Perceived annoyance with mobile advertising by students negatively affects the developed attitudes towards mobile advertising.		-0.274	p>0.05	Not confirmed
H4: Perceived ease of use of mobile devices and apps by students positively affects the developed attitudes towards mobile advertising.		-0.028	p>0.05	Not confirmed

**Figure 2***Hypotheses testing results*

the research (Eldridge et al., 2016) - the results of the pilot study conducted provide the directions regarding future research, as follows.

From a methodological point of view, we can conclude that the implementation of the main research, with a large random sample, would allow the use of structural equations modeling (SEM) - in a given limit regarding the number of respondents in the pilot study, we had to replace SEM with the two separate regression models. Finally, more data would allow additional constructs to be included in the model and the demographic variables that proved to be important in the past research (Kim and Han., 2014). Future research should consider the common method bias, which refers to the fact, that data for both independent and dependent variables are obtained from the same student in the same measurement context, leading to possible errors in the measurement items. Several approaches are known in the literature (a time lag between the measurements of dependent and independent variables or other ways to separate them, different scales etc.) to overcome these problems (Podskoff et al., 2003). Future research also plans to include comprehensive validation of measurement instruments. Content validity and discriminant validity analysis will supplement the results of the reliability and convergent validity.

While the pilot study confirmed the impact of attitudes towards mobile advertising on its perceived usefulness in students (H1), which was expected, we came across different results in modeling the impact of factors on attitudes towards mobile advertising. There is no doubt that, as expected, the perceived playfulness of mobile advertising has a positive effect on developing a positive attitude towards mobile advertising by students (H2), while the perceived annoyance and its impact on the attitude towards mobile advertising

(H3) didn't confirm a statistically significant effect. Although the results show a non-significant effect of perceived annoyance of mobile advertising on attitudes towards mobile advertising, it can be concluded from the negative sign of the regression coefficient that young people can still perceive mobile advertising as a distraction or as a disruptive factor that negatively affects their attitude to mobile advertising and consequently perceived usefulness of mobile advertisements. Therefore, future research should develop the measurement instrument of this construct in such a way that it would be possible to conclude which aspects of mobile advertising have a disruptive effect on young users. The larger sample we plan to form in the main research will allow for greater multidimensionality from a methodological point of view.

Also, the perceived ease of use of mobile devices and apps does not have a statistically significant effect on developing a positive attitude towards mobile advertising by students (H4). As we pointed out at the beginning of the pilot study, it can be assumed that the younger generation's ease of use of mobile devices and apps is less relevant. Probably, in the case of research that would like to address the perceived usefulness of mobile advertising in different age groups of users, this type of technological literacy would play a more important role. Pilot research results also suggest that the perceived ease of use of mobile devices and apps construct should be developed further; the measurement scale needs to be further developed, especially as this is a very dynamic and rapidly changing phenomenon, as both the quantity and the forms and manner of presenting information change rapidly. It would make sense to design this multidimensional variable with several dimensions that would allow capturing the flexibility of the phenomenon analyzed. In the present pilot study, only three-dimensional construct was formed.

Technology developments have created new marketing communication channels or media such as email, SMS and MMS (Multimedia Messaging Service). These digital media are considered to potentially improve the possibilities to reach consumers by allowing personalization of the content and context of the message (Worku et al., 2020). Mobile technologies that enable communication from any point without any space limit led to both technological and sociological significant changes (Kushwaha and Agrawal, 2016). Mobile advertisement psychologically impacts customers toward products being advertised to them through mobile messages. A customer will have an emotional response and start thinking about the product (Wut et al., 2021). Sethi et al. (2017), in their research on 50 students of Manipur University, found out that attitudes toward mobile advertising affect student intentions to receive mobile ads, and the perceived entertainment and

informativeness of mobile ads affect the attitude towards mobile advertising. Also, entertainment is essential to student attitudes toward mobile advertising.

The results of our research are crucial for continuing the main research on the importance of factors having a positive impact on the perception of the usefulness of mobile advertising among students and are also important for designers of communication channels with the younger generation. This also applies to a higher education institution that plans effective ways of communicating with students. While the field of study of students can play an essential role in shaping the factors and the form or strength of their influence on the attitude towards mobile advertising, the pilot study clearly showed that it makes sense to incorporate the concept of playfulness, humor, and lightness in communication with students.

**Acknowledgment:** This work has been fully supported by Croatian Science Foundation under the project UIP-2020-02-6312.

## References

- Amin, P., Amin, B.Z., & Patel, R.P. (2011). SMS marketing: the role of permission and acceptance. *International Journal of Mobile Marketing*, 6(2), 5–16.
- Beebe, L. H. (2007). What can we learn from pilot studies? *Perspectives in Psychiatric Care*, 43(4), 213–8. DOI: <https://doi.org/10.1111/j.1744-6163.2007.00136.x>
- Bolton, R. N., Parasuraman, A., Hoefnagels, A., Migchels, N., Kabadayi, S., Gruber, T., Loureiro, K.Y., & Solnet, D. (2013). Understanding Gen Y and their use of social media: A review and research agenda. *Journal of Service Management*, 24(3), 245–267. DOI: <https://doi.org/10.1108/09564231311326987>
- Conn, V. S., Algase, D. L., Rawl, S. M., Zerwic, J. J., & Wyman, J. F. (2010). Publishing pilot intervention work. *Western Journal of Nursing Research*, 32(8) 994–1010. DOI: <https://doi.org/10.1177/0193945910367229>
- Deloitte. (2017). *Global Mobile Consumer Survey: US edition, The dawn of the next era in mobile continues*. Turkey: Deloitte Development LLC.
- Doody, O., & Doody, C. M. (2015). Conducting a pilot study: Case study of a novice researcher. *British Journal of Nursing*, 24(21), 1074–1078. DOI: <https://doi.org/10.12968/bjon.2015.24.21.1074>
- Drossos, D., Giaglis, G., Lekakos, G., Kokkinaki, F., & Stavradi, M. (2007). Determinants of Effective SMS Advertising: An experimental Study. *Journal of Interactive Advertising*, 7(2), 1–23. DOI: <https://doi.org/10.1080/15252019.2007.10722128>
- Ducoffe, R. H. (1995). How Consumers Assess the Value of Advertising. *Journal of Current Issues & Research in Advertising*, 17(1), 1–18.
- Ducoffe, R.H., & Curlo, E. (2000). Advertising value and advertising processing. *Journal of Marketing Communication*, 6(4), 247–262. DOI: <https://doi.org/10.1080/10641734.1995.10505022>
- Eldridge, S. M., Lancaster, G. A., Campbell, M. J., Thabane, L., Hopewell, S., Coleman, C. L., & Bond, C. M. (2016). Defining feasibility and pilot studies in preparation for randomised controlled trials: Development of a conceptual framework. *PLoS One*, 11(3), 1–22. DOI: <https://doi.org/10.1371/journal.pone.0150205>
- Faseur, T., & Geuens, M. (2006). Different positive feelings to different ad evaluations: the case of coziness, excitement, and romance. *Journal of Advertising*, 35(4), 129–142. DOI: <https://doi.org/10.2753/JOA0091-3367350409>
- Florenthal, B. (2019). Young consumers' motivational drivers of brand engagement behavior on social media sites: A synthesized U&G and TAM framework. *Journal of Research in Interactive Marketing*, 13(3), 351–391. DOI: <https://doi.org/10.1108/JRIM-05-2018-0064>
- Fraser, Y, Fahlman, D., Arcsott, J., & Guillot, I. (2018). Pilot Testing for Feasibility in a Study of Student Retention and Attrition in Online Undergraduate Programs. *International review of Research in open and distributed learning*, 19(1), 260–278. DOI: <https://doi.org/10.19173/irrodl.v19i1.3326>

- Haghirian, P. & Dickinger, A. (2005). Identifying success factors of mobile marketing, *Asia Pacific Advances In Consumer Research*, 6, 28-29.
- Haghirian, P., & Inoue, A. (2007). An advanced model of consumer attitudes toward advertising on the mobile internet. *International Journal of Mobile Communications*, 5(1), 48–67. DOI: <https://doi.org/10.1504/IJMC.2007.011489>
- Hwang, J., Yoon, Y.S., & Park, N.H. (2011). Structural effects of cognition and affective responses to web advertisements, website and brand attitudes, and purchase intentions: the case of casual-dining restaurants. *International Journal of Hospitality Management*, 30(4), 897–907. DOI: <https://doi.org/10.1016/j.ijhm.2011.01.011>
- In, J. (2017). Introduction of a pilot study. *Korean Journal of Anesthesiology*, 70(6), 601. DOI: <https://doi.org/10.4097/kjae.2017.70.6.601>
- Ito, M., & Okabe, D. (2006). Technosocial situations: emergent structuring of mobile email use. Retrieved from <https://ieeexplore.ieee.org/document/6289686>
- Jun, J.W., & Lee, S. (2007). Mobile media use and its impact on consumer attitudes toward mobile advertising. *International Journal of Mobile Marketing*, 2(1), 50–8.
- Keith, M. (2011). Mobile and online marketing communications: an exploratory investigation and typology of mobile information search, perceived credibility, and WOM behavior among Generation Y. AMA Summer Educators' Conference Proceedings 2011 in San Francisco, CA, American Marketing Association, Chicago, IL, pp. 2227-2228.
- Kim, Y. J., & Han, J. (2014). Why smartphone advertising attracts customers: A model of Web advertising, flow, and personalization. *Computers in Human Behavior*, 33, 256–269. DOI: <https://doi.org/10.1016/j.chb.2014.01.015>
- Koo, W., Knight, D.K., Yang, K., & Xiang, Z. (2012). Generation Y consumers' value perceptions toward apparel mobile advertising: functions of modality and culture. *International Journal of Marketing Studies*, 4(2), 56–66. DOI: <https://doi.org/10.5539/ijms.v4n2p56>
- Kumar, A., & Lim, H. (2008). Age differences in mobile service perceptions: Comparison of Generation Y and baby boomers. *Journal of Services Marketing*, 22(7), 568–577. DOI: <https://doi.org/10.1108/08876040810909695>
- Kushwaha, G.S., & Agrawal, S.R. (2016). The impact of mobile marketing initiatives on customers' attitudes and behavioural outcomes. *Journal of Research in Interactive Marketing*, 10(3), 150–176. DOI: <https://doi.org/10.1108/JRIM-06-2015-0041>
- Law, D., Wong, C., & Yip, J. (2012). How does visual merchandising affect consumer affective response? An intimate apparel experience. *European Journal of Marketing*, 46(1/2), 112–133. DOI: <https://doi.org/10.1108/03090561211189266>
- Lee, S.F., Tsai, Y.C., & Jih, W.J. (2006). An empirical examination of customer perceptions of mobile advertising. *Information Resources Management Journal*, 19(4), 39–55. DOI: <https://doi.org/10.4018/irmj.2006100103>
- Lerner, J.S., & Keltner, D. (2000). Beyond valence: toward a model of emotion-specific influence on judgement and choice. *Cognition and Emotion*, 14(4), 473–493. DOI: <https://doi.org/10.1080/026999300402763>
- Liu, C.-L. E., Sinkovics, R.R., Pezderka, N., & Haghirian, P. (2012). Determinants of consumer perceptions toward mobile advertising – a comparison between Japan and Austria. *Journal of Interactive marketing*, 26, 21-32. DOI: <https://doi.org/10.1016/j.intmar.2011.07.002>
- McQuail, D. (2010). *McQuail's mass communication theory*. California: Sage publications.
- Mobile Marketing Association. (2022). MMA - Mobile Marketing Association. Retrieved from <https://www.mmaglobal.com>
- Moore, C.G., Carter, R.E., Nietert, P.J., & Stewart, P.W. (2011). Recommendations for planning pilot studies in clinical and translational research. *Clinical and Translational Science*, 4(5), 332-337. DOI: <https://doi.org/10.1111/j.1752-8062.2011.00347.x>
- Murillo-Zegarra, M., Ruiz-Mafe, C., & Sanz-Blas, S. (2020). The effects of Mobile advertising Alerts and perceived value on Continuance intention for branded mobile apps, *Sustainability*, 12(17), 6753. DOI: <https://doi.org/10.3390/su12176753>
- Muzaffar, F., & Kamran, S. (2011). SMS advertising: youth attitude towards perceived informativeness, irritation, and credibility. *Interdisciplinary Journal of Contemporary Research in Business*, 3(1), 230–245.
- Podsakoff, P. M., MacKenzie, S. B., Lee, J. Y., & Podsakoff, N. P. (2003). Common Method Biases in Behavioral Research: A Critical Review of the Literature and Recommended Remedies. *Journal of Applied Psychology*, 88(5), 879-903. DOI: <https://doi.org/10.1037/0021-9010.88.5.879>
- Qin, L., & Yan, H. (2017). Attitudes towards mobile advertising and mobile web information acquisition behaviour: perspectives from the advertising value, credibility and self-efficacy, *Advances in Social Sciences, Education and Humanities Research*, 7, 368–373. DOI: <https://doi.org/10.2991/icmess-17.2017.88>
- Reisenwitz, T.H. (2021). Differences in Generation Y and Generation Z: implications for marketers, *The Marketing Management Journal*, 31(2), 78-92.
- Sethi, G., & Singh, M. I. (2017). The Impact of Mobile Advertisement on the Students of Manipur University. *International Journal of Science and Research*, 6(6), 755–765.
- Statista (2022). Advertising & Marketing. Retrieved from <https://www.statista.com>

- Tabachnick, B.G., & Fidell, L.S. (2013). *Using multivariate statistics*. Boston: Pearson.
- Varnali, K., Yilmaz, C., & Toker, A. (2012). Predictors of attitudinal and behavioural outcomes in mobile advertising: A field experiment. *Electronic Commerce Research and Applications*, 11(6), 570–581. DOI: <https://doi.org/10.1016/j.elerap.2012.08.002>
- Wong, W., & Malone, T. (2016). Contribution of vanity to consumer apparel advertising perception. *Journal of Fashion Marketing and Management*, 20(1), 54–71. DOI: <https://doi.org/10.1108/JFMM-06-2015-0045>
- Worku, A., Shitahun, H., Mebrate, Y., & Andaregie, A. (2020). Assessing the attitude towards mobile marketing among university students. *African Journal of Marketing Management*, 12(1), 1–10. DOI: <https://doi.org/10.5897/AJMM2019.0629>
- Wut, E., Ng, P., Leung, K.S.W., & Lee, D. (2021). Do gamified elements affect young people's use behaviour on consumption-related mobile applications? *Young Consumers*, 22(3), 368–386. DOI: <https://doi.org/10.1108/YC-10-2020-1218>
- Zhang, T.C., Abound Omran, B., & Cobanoglu, C. (2017). Generation Y's positive and negative eWOM: use of social media and mobile technology. *International Journal of Contemporary Hospitality Management*, 29(2), 732–761. DOI: <https://doi.org/10.1108/IJCHM-10-2015-0611>

## Pilotna študija nekaterih vidikov zaznane uporabnosti mobilnega oglaševanja med študenti

### Izvleček

Pilotna raziskava je pogosto namenjena zbiranju predhodnih informacij in običajno temelji na majhnem nizu opazovanj, ki pomagajo pri odločitvi, kako izvesti obsežnejšo študijo. Namen pričujoče pilotne študije je zagotoviti predhodne rezultate glede različnih vidikov zaznavanja mobilnega oglaševanja pri mladih. Cilj te pilotne študije je tudi izvesti začetno analizo odnosov in vpliva predhodnikov (vplivnih dejavnikov) na odnos do mobilnega oglaševanja in na zaznano uporabnost mobilnega oglaševanja med mladimi. Rezultati kažejo, da so bili cilji pilotne študije izpolnjeni. So ključni za nadaljevanje glavne raziskave o pomenu dejavnikov, ki vplivajo na pozitivno zaznavanje uporabnosti mobilnega oglaševanja med študenti, in za oblikovalce komunikacijskih kanalov za mlajšo generacijo.

*Ključne besede:* mobilno oglaševanje, pilotna študija, študenti, mlajša generacija