Alexa, Please Do Me a Favor:
Motivations and Perceived Values Involved in Using AI Assistant

[1]Eunji Lee, [2]Jongmin Lee, [3]Yongjun Sung*

[1]*Assistant Professor, Department of Liberal Arts, Sangji University, South Korea*
[2]*Doctoral Student, Department Advertising and Public Relations, University of Georgia, USA*
[3]*Professor, School of Psychology, Korea University, South Korea*
ejlee427@sangji.ac.kr, jongmin.lee@uga.edu, sungyj@korea.ac.kr

Abstract

AI assistant, a software interface designed to interact with a user in a natural way and perform specific tasks on the user's behalf, receives increasing attention from both scholars and practitioners. While most of the literatures explain about technical aspects, little is known about the social and psychological factors that intimately influence consumers when using it. This study sheds light on the reason people use AI assistant and how perceived values influence on intention of continuous usage. A total of 361 AI assistant users participated in an online survey, and all were recruited from a major online panel in South Korea. The results from the principal component analysis suggest five social and psychological motives: self-expression, quality of life, entertainment, information, and compatibility. In addition, perceived values, informativeness, entertainment, and trustworthiness, positively predict the intention to use AI assistant. This research provides theoretical contributions from finding motivations of AI assistant usage and from the effects of perceived values on the intention to use it. Practical implications should not be overlooked in this ever-expanding AI industry.

Keywords: Artificial Intelligence, AI Assistant, Motivation, Informativeness, Entertainment, Trustworthiness

1. INTRODUCTION

Fourth industrial revolution accelerated the AI assistant market more rapidly expanding worldwide. According to a report from Gartner [1], the market for AI assistant products reached USD 2.1 billion by 2020, and the global market value of the technology is expected to exceed USD 9 billion by 2023 [2]. AI assistant is a software interface designed to interact with a user in a natural manner and perform specific tasks on the user's behalf [3]. Compared to that traditional robots executed a limited range of functions, AI assistant is specialized in a broader, more flexible, and more sophisticated service applications [3]. For example, when senior citizens need support, AI assistant provides higher quality services by implementing both emotional and functional supports on them. It is reported that the Alexa, a type of AI assistant rooted in Amazon, helps older adults do different types of activities from setting alarms for a reminder to having them stay connected with cherished ones [4]. In doing so, the AI assistant alleviates loneliness [5]. In a sense, AI assistant, which was once merely a technological device, is actively adopted by a high volume of users and it is reported that the users are integrating their AI assistant deep into their lives [6].

Despite its popularity and observed changes in people's life patterns, few academic research has been conducted to explore what drives people to use the device and even interact with it. In line with the broad question, this research is designed to answer the questions in two folds. As a first fold, the current research aims to identify psychological and social motivations of using AI assistant. Before AI assistant, other types of media technologies have previously been investigated to understand its popularity over time. For instance, there has been attempts by scholars to explore and investigate motivational factors for adopting Internet when the service began to get popularized, especially focusing on its aspect efficiently connecting people [7]. The main motivational factors discovered were interpersonal utility, pastime, information seeking, convenience, and entertainment. As technology kept advanced, social media gained power and introduced people to the next phase of getting connected and interactive with others. Major motivations for using social media were self-presentation, social interaction, information seeking, archiving, entertainment, pass time, communicatory utility, and so on [8-11]. Even more recently, four major motivations for avatar creation in virtual worlds (virtual exploration, social navigation, contextual adaptation, and identity representation) and for Chatbot (productivity, entertainment, social/relational purpose, novelty/curiosity) were investigated in order to tackle different motivations for different media technologies [12].

In artificial agent research, of course, a few research have been conducted to understand what drives people even actively engage with AI, but they tend to be too fragmentary and inconsistent to fully address the curiosity. First limitation lies in the inconsistent terminologies indicating the AI assistant (*e.g.*, digital assistant, intelligent personal assistant), thereby resulting in difficulties to fully understand how and why users are actively engage with it. Moreover, a few attitudinal factors have been examined respectively which resulted in obstacles to evaluate it as a whole. For instance, one of the studies targeted senior users to investigate which supports the 'intelligent personal assistant' provides. As a result, AI assistant provided both functional and emotional supports. They performed weather forecasting, note-taking, or text message writing on behalf of senior citizens and aided them to strengthen their social activities [13-15]. Another article recently published identified the positive influence of usefulness and enjoyment on engaging with AI assistant [16]. However, it is still void in the literature on why and how people are enthralled by interacting with human-like AI assistant and finds fundamental and significant gaps to identify thoughts in their mind [3]. Thus, this study aims to discover the underlying psychological and social motivations for using an AI assistant.

As a second fold, the present research aims to focus on the comprehensive factors that affect overall values users perceive in order to predict actual usage of AI assistant. The perceived value, which is the net effect of gains and losses, has a strong influence on both satisfaction and post-purchase behaviors [17-20]. In order to form an overall value on AI assistant, potential sub-values need to be identified. In using IoT technologies, enjoyment value and trust played as significant determinants of behavioral intention [21]. Trust value was also emphasized as a meaningful value in communication with virtual agent [22]. In addition, multiple studies identified informativeness and playfulness/enjoyment values in common to predict attitudes and intentions to use innovative media technologies [23-24]. Considering that AI assistant plays as an information sources by providing functional support, informativeness can be potential factor that consists of the overall value. The users are experiencing fun because the interaction is totally based on voice-mediated communication inducing them enjoyments [24]. Lastly, AI assistants contain a large number of and highly private information, so the users highly seeks security and safety. Based on the previous literature reviewed above, three major values, which are informativeness, entertainment, and trustworthiness, are expected for the users to perceive when they use AI assistants.

Therefore, the current study aims to 1) identify psychological and social motives of using AI assistant, and 2) empirically verify the effect of perceived values (informativeness, entertainment, and trustworthiness) on

the intention to use an AI assistant.

2. THEORY, RESEARCH QUESTION, HYPOTHESES

2.1   Motivations for Using AI Assistant: Uses and Gratifications Theory

Media uses, in general, are directed by the needs of individuals that they seek to gratify [25-26]. Exploring the gratifications that individuals seek from media helps better understand reasons for their recurring use of the media as well as prediction of media selection [27]. Based on Uses and Gratifications (U&G) theory, individuals have psychological needs that motivate the use of particular media among competitors to gratify their needs [28-29]. Thus, the fundamental assumption of U&G theory lies on that individuals are actively involved in seeking out media that fulfill their needs and lead them to gratifications [8, 30].

U&G theory was initially developed to identify motivations of traditional forms of mass media such as TV or radio, but later was extended to explain usages of other forms of media such as e-mail, online shopping websites, smartphones, and social media [7, 29, 31-40]. For instance, researchers found that SNSs meet the needs of belonging, hedonism, self-esteem, and reciprocity [36]. Scholars also identified four needs that can be gratified by generating own contents through social media: social and affection needs, venting negative feeling, recognition needs, and cognitive needs [38].

By this firm basis of U&G theory in communication literatures, its theoretical framework provides solid foundation and relevance with research on AI assistant as a newly evolving medium. Previous research has consistently demonstrated relationship building, convenience, information seeking, entertainment, and affection as motives for using new technologies of communication [8, 37-39]. While AI assistant shares some characteristics, it clearly holds a different positioning for some other aspects. First, AI assistant is based on artificial intelligence technology. AI assistant learns and proactively customizes its services without users' instant inputs. Advanced technologies of information and telecommunication prop up its range of the service by accessing big data sources or automated smart home control [41]. Second, AI assistant utilizes voice recognition and provides a direct communication with natural languages. It does not only enhance users' convenience to access and task-efficiency but also develop interactivity with the medium itself [43]. Considering those distinctions from the existing media, underlying motivations of using AI assistant will be distinctive, and thus identifying motives for using AI assistant is timely and relevant. Hence, the present study poses the following research question:

RQ1. What are the underlying psychological and social motives for using AI assistant?

2.2   Intention to Use AI assistant and its Perceived Value

Intention to use, in general, is derived from behavioral intention, which is defined as "the strength of one's intention to perform a specified behavior [42]." Consumers are motivated to adopt products or services by their intention to use [43]. Perceived value has been discussed to be a core predictor of intention to use in the field of information technology. Research examined the perception of overall value on hedonic digital artifacts positively predicts intention to use, and it is also explored that the impact of online blog on the continuance intention to use it [44-45]. Another research diversified the value of using location-based mobile services (i.e., conditional, monetary, and convenience value) and demonstrated its prediction of behavioral intention to use the services [46]. Recently, the association of perceived value with intention to use was also investigated in the adopting innovative media technologies [43, 47-48]. Considering that AI assistant has its original values that drive people to engage in, it is thus necessary to explore the effect of perceived value in order to predict the users' intention to use for better understanding of users' actual usage of AI assistant. The hypothesis can

be set forth:

H1: The perceived value is positively related to intention to use.

2.3   Perceived Value for Using AI Assistant

Perceived value, refers to a subjective evaluation on adopting products or services, has been investigated to address the relationships between the characteristics of products or services and intentions of the consumers to consume [49]. The value perception is generated from a tradeoff between potential benefits and losses out of obtaining a product or a service [17]. A number of researches has categorized perceived value into several dimensions in order to explain the intention and actual use of new media technologies.

Informativeness is defined as using media to seek out information or to self-educate [8]. Informativeness is regarded as a functional value, which is the utility derived from the quality and expected performance, in value perception research [50]. It has been highly investigated and most of the results consistently point out that information seeking is one of the major benefits the users could earn from using communication technologies [51-54]. At initial stage of social media research, the benefit of accessing the media platforms had centered on social value as it connects with friends and family. Facebook, for example, first initiated for college students to stay in touch with each other and maintain the social ties [55]. In the present, however, the nature of social media has evolved that the users do not only maintain social relationships but accommodate diversified functions such as archiving and documenting their life events, personal images, and personal information [9, 55]. Among the diversified values, knowledge gathering is one of the emphasized ones for using SNS [55]. Considering that AI assistant strongly serves as an information searching tool, the hypothesis can be set forth:

H2: Informativeness of AI assistant is positively related to the perceived value.

Entertainment refers to the degree of positive and playful state of emotion when using a product or a service [50]. The utility derived from the feelings or affective states that products engender has been revealed to constitute the dimensions of value perception [50]. In previous research, enjoyment has been considered as an intrinsic value for adopting information technologies [56-57]. Researchers identified entertainment as one of the most significant predictors of internet, and another research reported that entertainment is a core value in social media across four types of different platforms: Facebook, Twitter Instagram, and Snapchat [55, 58]. Scholars also demonstrated that enjoyment and pleasure obtained from interacting with in-home voice assistant relate to hedonic values the users can have [59]. Similarly, consumers' perceived enjoyment significantly predicted in adoption of mobile internet and media tablets [44, 56]. As a key value for interactive communicating tools, the hypothesis can be set forth:

H3: Entertainment value of AI assistant is positively related to the perceived value.

Trustworthiness is defined as the degree the users can trust the media services. It is regarded as a central anteceding factor of technology acceptance and use from the literature [60-63]. Trustworthiness also plays a crucial role in lessoning perceived uncertainty and risks, which might occur when using the services [64]. Trustworthiness is reported not only to affect uses of new technologies that operate users' personal information such as IoT technologies, but influence on perceived value of both online and offline banking [21, 65]. Researchers examined that the judgements of trust toward service providers will influence on the value by reducing uncertainty and forming reliable expectations [66]. Above all, developing a sense of trust is critical for building an interpersonal relationship [67]. Considering that users began building close relationship with AI assistant, trustworthiness should be crucial for the relationships. In line with human-robot research, trustworthiness has been proved to have positive influence on the usage and interactivity with a robot. It is also revealed that the effectiveness is not limited, but expected to expand such as robots in industry, medical, military, service, entertainment, and therapy [68]. Based on the previous research that trustworthiness is crucial

for direct interactions between human users and the humanized agents, the hypothesis can be set forth:

H4: Trustworthiness of AI assistant is positively related to the perceived value.

3. METHODS

3.1 Participants

The respondents in an online survey, conducted over two weeks, were recruited from an online panel in South Korea. 359 out of the 361 were actual AI assistant users, so they participated in the study and were analyzed. The final sample included 180 females and 179 males, and their age ranged from 20 to 59, with an average of 39.23. The participants indicated that they have used an AI assistant, on average, for 8.1 months (SD= 9.43), and actual use ranged from 1 to 48 months. Table 1 shows the basic characteristics of the sample.

Table 1. Sample characteristics (n = 359)

Sample Profile	Mean (min – max)	
Age	**39.23 years old (20 – 59, *SD* = 10.98)**	
Gender		
Male	49.9%	
Female	50.1%	
VPA Usage	**Mean (min – max, *SD*)**	
Number of VPA currently in use	**1.3 (1 – 4, *SD* = 0.58)**	
Usage period	**8.1 months (1 – 70, *SD* = 9.43)**	
Daily usage	**3.71 (1;Barely – 7;Frequently, *SD* = 1.38)**	
Name of VPA currently in use	**Frequency (*n*)**	**Percentage (%)**
Apple Siri	127	35.4
Samsung Bixby	125	34.8
SKT Nugu(including mini)	72	20.1
KT Giga Genie	68	18.9
Google Home	59	16.4
Kakao Mini (smart speaker)	47	13.1
Naver Clover (including mini)	40	11.1
Smart home appliances	15	4.2
Amazon Alexa	11	3.1
Apple Homepod	9	2.5
Amazon Echo	7	1.9
Naver Wave	6	1.7
Etc.	2	0.6

3.2 Measures

Scale items for measuring the motivation for using AI assistant were constructed in a series of steps. First, items from the related literatures on the Internet of Things were explored [21, 69]. Because of the large number

of items, it was deemed appropriate to obtain a more manageable and relevant scale applicable to an AI assistant. Thus, items that were similar to each other were either eliminated or revised for this study. Next, an independent group of active AI assistant users (*n*=30; 15 females) were asked to eliminate items they regarded as irrelevant to the context of AI assistant. Finally, they were asked to list additional reasons for using an AI assistant. Consequently, a total of 26 unique statements about motivations for using AI assistant were developed. Respondents were asked to indicate how much they agreed or disagreed with each item on a seven-point Likert-type scale (responses ranged from "1 = strongly disagree" to "7 = "strongly agree").

AI assistant usage was operationalized by asking respondents to examine how often they used it per day, and how long they have been using it. Further, respondents were also asked about the primary activities they performed through an AI assistant.

The perceived value of an AI assistant was measured from the respondents' rating for the items' descriptions on a seven-point Likert-type scale [70]. Perceived informativeness was measured by three items (i.e., *The AI assistant I use provides the appropriate information*). Cronbach's alpha was .92. Next, perceived entertainment was measured by four items (i.e., *The AI assistant I use provides me pleasure*). Cronbach's alpha was .94. Perceived trustworthiness was measured by two items (i.e., *The AI assistant I use is trustworthiness*). Cronbach's alpha was .95. Finally, intention to use an AI assistant in the future was measured by three seven-point semantic differential scales (i.e., likely/unlikely) [9]. Cronbach's alpha was .93.

4. RESULTS

4.1 Principal Component Analysis (PCA)

To answer the research question, a principal component analysis (PCA), with varimax rotation, was performed to determine the underlying motives for using an AI assistant. The PCA was conducted under the following criteria: eigenvalue (>1.0); variance explained by each component; loading score for each factor ($\geq |0.50|$); and meaningfulness of each dimension. Eight items that had high loadings on more than two components were eliminated, and another item that did not fit any dimension was also excluded. Finally, PCA was rerun with the 18 items. Table 2 shows that a meaningful and interpretable five-component solution was obtained; the five components explained 77.80% of the total variance.

Table 2. Motivations for using VPA (*n* = 359)

	1	2	3	4	5
Self-expression (α = 0.94)					
For it serves me nicely	**0.90**	0.10	0.10	0.19	-0.02
For it consoles me	**0.89**	0.06	0.04	0.16	-0.03
For it sympathizes me	**0.87**	0.14	0.13	0.24	0.03
For it expresses myself as an early adopter	**0.84**	0.16	0.15	0.04	0.17
For it expresses myself	**0.84**	0.19	0.15	0.17	0.15
Quality of life (Usefulness) (α = 0.91)					
For it increases my quality of life	0.17	**0.78**	0.29	0.27	0.16
For it provides satisfaction of living	0.28	**0.77**	0.26	0.26	0.14
For it enables me a multi-tasking	0.15	**0.76**	0.20	0.08	0.30
For it helps me in life	0.08	**0.76**	0.29	0.19	0.29

Information (α = 0.84)

For it provides information	0.08	0.31	**0.79**	0.19	0.23
For it provides information of my need at an appropriate time	0.08	0.29	**0.78**	0.15	0.24
For it manages tasks efficiently	0.12	0.31	**0.72**	0.09	0.09

Entertainment (α = 0.82)

For it is fun	0.23	0.23	0.13	**0.83**	0.14
For it meets my entertaining needs	0.27	0.13	0.12	**0.78**	0.12
For it stimulates my curiosity	0.14	0.24	0.17	**0.63**	0.27

Applied function (α = 0.82)

For it is an attached function of products I purchased	0.00	0.15	0.06	0.21	**0.81**
For it enables device-to-device connections	0.21	0.29	0.28	0.05	**0.72**
For it attaches to other major functions (speaker, set-top, etc.)	0.00	0.28	0.26	0.21	**0.69**

Eigenvalue	4.2	3.0	2.3	2.2	2.1
% of Variance	23.7	16.8	13.0	12.2	12.1
Cumulative %	23.7	40.5	53.5	65.7	77.8

Note. Loadings that were 0.50 or larger are in boldface.

The first component, labeled "*self-expression*", accounted for 23.77% of the variance after rotation, and its five items formed a reliable scale, as assessed by Cronbach's alpha (α = 0.94). The second component, "*quality of life,*" consisted of four items, and accounted for 16.77% of the variance (α = 0.91). The third component, "*information,*" explained 12.99% of the variance, and the scale with three items was found to be reliable (α = 0.84). The fourth component, "*entertainment,*" included three items (α = 0.82) and explained 12.20% of the variance. Finally, the fifth component, "*applied function (compatibility),*" with three items, accounted for 12.20% of the variance (α = 0.82). Given the acceptable reliability values, the five motivation indices were created by taking the average of their constituent items for the following analyses. See Table 3 for full factor loadings and the variance explained by them.

Table 3. Partial correlations among the motives

	1	2	3	4	5	*M*(*SD*)
1. Self-expression	1.00					3.57(1.32)
2. Quality of life (Usefulness)	0.41**	1.00				4.78(1.10)
3. Information	0.39**	0.68**	1.00			4.57(1.07)
4. Entertainment	0.51**	0.56**	0.47**	1.00		4.44(1.15)
5. Applied functions	0.25**	0.61**	0.55**	0.48**	1.00	4.76(1.05)

Notes: Control variables: age, gender. *M*, mean, *SD,* standard deviation.
**$p < 0.001$

To investigate the proposed hypotheses, the present research conducted both confirmative factor analysis

(CFA) and structural equation modeling (SEM). The measurement model was first analyzed in order to verify the reliability and validity, and structural model analysis was followed. The current research employed software package AMOS 18 to conduct a series of analyses.

4.2 Measurement Model Analysis

Before structural model analysis, the reliability and validity of the measurement model were verified. The measured model revealed a good fit: χ^2/df=3.033; $p < 0.001$; CFI=0.975; TLI=0.967; RMSEA=0.075. Both CFI and TLI were more than 0.9, and RMSEA was less than 0.08, which meet recommended fit indices [71-72]. For each construct, Cronbach's alpha was more than 0.7, confirming internal reliability [73]. The convergent validity can be verified by factor loadings, composite reliability (CR), and average variance extracted (AVE) of all construct. In the result of CFA, all factor loadings exceeded the minimum criteria of 0.6, confirming convergent validity [74]. CR and AVE of each construct was more than 0.7 and 0.5 respectively, confirming its convergent validity [72-73]. The discriminant validity of the present measurement was also considered satisfactory by the all correlations between constructs being smaller than the square root of the AVE [75]. As shown in Table 4, internal reliability and convergent validity of the current model were verified. Table 5 is followed to show a satisfactory discriminant validity of the measurement.

Table 4. Correlations among variables (Root square of average variance extracted)

	Informativeness	Entertainment	Trustworthiness	Perceived Value	Intention to use
Informativeness	(0.91)				
Entertainment	0.740**	(0.90)			
Trustworthiness	0.706**	0.732**	(0.95)		
Perceived Value	0.839**	0.768**	0.767**	(0.89)	
Intention to use	0.777**	0.726**	0.707**	0.794**	(0.92)
M	4.67	4.52	4.34	4.48	4.50
SD	1.14	1.20	1.25	1.11	1.18

**$p < 0.01$

Table 5. Measurement model fit indices

Latent Variable(s)	Measured Variable(s)	Estimate		S.E.	C.R. (Critical Ratio)	AVE	C.R. (Construct Reliability)	Cronbach's alpha
		B	β					
Informativeness	Info1	1	0.932			0.835	0.938	0.919
	Info2	1.013	0.932	0.031	32.328***			
	Info3	0.938	0.876	0.035	26.918***			
Entertainment	Ent4	1	0.915			0.808	0.944	0.944
	Ent3	0.931	0.881	0.036	26.162***			
	Ent2	1.044	0.918	0.036	29.178***			
	Ent1	0.988	0.881	0.038	26.129***			
Trustworthiness	Trust2	1	0.961			0.900	0.947	0.950
	Trust1	1.005	0.936	0.030	33.358***			

	Value1	1	0.834					
Perceived value	Value2	1.178	0.929	0.050	23.527***	0.794	0.920	0.919
	Value3	1.114	0.908	0.049	22.635***			
	Intent1	1	0.891					
Intention to use	Intent2	1.072	0.925	0.039	27.569***	0.844	0.942	0.930
	Intent3	1.106	0.939	0.039	28.581***			

***p < 0.001

4.3 Structural Model Analysis

The detailed indices of the structural model analysis are shown in Table 6 and 7. For testing the fit of the proposed model, the present research employed comparative fit index (CFI), Tucker-Lewis-Index (TLI), Goodness-of-Fit-Index (GFI), and the root mean square error of approximation (RMSEA). The values of CFI, TLI, GFI in present research were all more than 0.9, determined as good fit indices of the model [71]. RMSEA also did not exceed 0.8, indicating an acceptable model fit [71].

Table 6. Structural model fit indices

Model	χ^2	df	RMR	GFI	NFI	TLI	CFI	RMSEA
Structural model	261.475***	83	0.044	0.915	0.960	0.965	0.972	0.078

***p < 0.001

Table 7. Structural model path analyses

Path	Estimate		S.E.	C.R.
	B	β		
Informativeness→Perceived value	0.480***	0.556	0.043	11.118
Entertainment→Perceived value	0.158***	0.193	0.040	3.964
Trustworthiness→Perceived value	0.216***	0.271	0.037	5.871
Perceived value→Intention to use	0.961***	0.865	0.054	17.759

***p < 0.001

The perceived value of using AI assistant had a significant influence on intention to use (β = 0.865, Critical Ratio = 17.759, *p* < 0.001), supporting H1. In addition, three factors informativeness (β = .556, C.R. = 11.118, *p* < 0.001), entertainment (β = 0.193, C.R. = 3.964, *p* < 0.001), and trustworthiness (β = 0.271, C.R. = 5.871, *p* < 0.001) had positive impacts on the perceived value, thereby supporting H2, H3, and H4 respectively.

5. CONCLUSION

By surveying a sample of 359 active AI assistant users in South Korea, this study sheds light on user's characteristics and perceived values for engaging with an AI assistant. The present study revealed what drives people to engage with AI assistant and how intention to use AI assistant is predicted by perceived value with three sub-factors. The findings of the study determined that AI assistant users have five primary social and psychological motives: self-expression, quality of life, information, entertainment, and compatibility (applied

function). In addition, informativeness, entertainment, and trustworthiness showed positive influence on the perception of overall value for using AI assistant, and the perceived value positively predicted the intention to use AI assistant.

The present findings reveal that *self-expression* is a strong factor for the users to engage with an AI assistant and it was reported that the users are motivated to interact with the device to express themselves. The finding is more promising that the AI assistant was not responsive as much as the users can freely converse with. Current AI assistant is defined as a soft agent that simply helps in performing tasks and serving users [3]. However, users were not only able to take advantage of functional utilities of AI assistant, but also able to even receive social support from the simple responses of sympathy expressed by an AI assistant. This result is consistent with the finding that the smart device users utilize the product to reflect their identities and express their uniqueness [76]. Given that previous research mainly focused on technical functions in terms of values of AI assistant, this research emphasizes that self-expression and identification also play major roles for driving people to use.

Quality of life and *information* are the other primary motivations. That is, AI assistant users are motivated to increase their quality of life and search for information they require at any given moment by using an AI assistant. In line with that, the need for using AI assistant is increasing worldwide as consumers are able to get benefited from it by improving their lifestyles [77]. For instance, it can be useful by letting you do more multi-tasking in everyday life by saving time and raising efficiency; thus, one can work while the AI assistant drives safely [78]. Residents of a smart home, controlled by an AI assistant, will also reduce energy consuming for making up and securing their houses [79].

In addition, the results on the *entertainment* motive demonstrate the need of users to get entertained. The users had a level of curiosity from engaging with an intelligent non-human entity satisfy their curiosity, and the AI assistant was able to solve the curiosity somehow for interacting with artificial intelligent. It supports the previous finding that an AI assistant's voice-based interactions with the user provides enjoyment [80]. And the results are also aligned with the literatures that the entertainment value is a major drive for using new technologies and devices [24, 80].

Compatibility (applied function) motive shows that the users are utilizing an AI assistant because it is applied to the other products that they mainly used. For instance, the results 'inform us that several users have been using Siri (AI assistant) when none of the users reported that they purchased iPhone because it has Siri (AI assistant). Likewise, AI assistant technology are widely applied to different types of platforms, such as built-in mobile operating systems (*e.g.*, Apple Siri and Samsung Galaxy Bixby), smart speakers (*e.g.*, Amazon Echo and Google Home), or smart home technologies (*e.g.*, LG ThinQ). And the consumers end up using the AI assistant in the process of using other devices or platforms which come along with AI assistant. In collaboration with an AI assistant, the current devices and technologies can also provide integrated services and utilities, and thereby offering more convenience.

The current findings contribute to the psychological understanding of AI assistant users by exploring what motivates people to use the product and by demonstrating the values for potential use. Previous research has identified a wide range of factors influencing on adopting the products or services [44, 80]. In context of AI-based products, however, it is not clearly identified to explain basic questions of why the increasing amount of people are getting engaged in AI-based agents and which values the users are recognizing in building deeper relationships with an AI assistant. This research provides better understandings that users recognize entertainment as a significant value when communicating with a humanized voice [24, 80]. The finding also broadens our knowledge of AI device acceptance that informativeness and trustworthiness serve as factors predicting the value perception of AI assistant. Consequently, the findings emphasizing the importance of the

overall values to increase intentions and actual behaviors of engaging in human-AI interactions.

In the meantime, this study also provides practical implications for both marketers and engineers who are seeking the ways to reinforce the bonds between consumers and the AI assistant. Particularly, AI assistant's informativeness turns out to be the most important factor for value perception, and trustworthiness and entertainment were followed. This indicates that the users could form more solid relationship with AI assistant not only by developing the AI assistant as a better information source but also by emphasizing the value of AI assistant as a convenient information provider to the consumers. At the same time, the users will perceive more value by having more experiences of the venues that the consumers may build more bondage with AI assistant. In addition, it is expected to include newer entertaining experiences that the users may have in the process of engaging with AI assistant because the threshold for entertainment perception will increase as the uses keep actively using it.

Last but not least, the present research also points out that the scholars and practitioners should not overlook that the users are not only appealed by technical aspects (*e.g..*, quality of life, information, and compatibility) when using an AI assistant, but also appreciated by its emotional aspects *(e.g.*, self-identification and entertainment). Based on this implication, this study provides a preliminary foundation that the AI-based virtual personal assistant needs to be differentiated from other communication technologies by integrating the possibilities that the users may develop deeper relationships with the AI agent with emotional supports. Future research is, therefore, necessary to explore the factors that help building emotional bondage in order to have wider implications such as in clinical therapies for aiding those who are not proficient in interpersonal communication. This research is ultimately expected to contribute to the initial background knowledge in both academia and practices about those who are actively using AI assistant and their specific motives and needs of consuming the innovative technology.

ACKNOWLEDGEMENT

REFERENCES

[1] Gartner. Gartner Says Worldwide Spending on VPA-Enabled Wireless Speakers Will Top $2 Billion by 2020. https://www.gartner.com/en/newsroom/press-releases/2016-10-03-gartner-says-worldwide-spending-on-vpa-enabled-wireless-speakers-will-top-2-billion-by-2020

[2] Research and Markets. Intelligent virtual assistant market: global industry trends, share, size, growth, opportunity and forecast 2018–2023. https://www.researchandmarkets.com/research/bthc3k/global?w=5

[3] A. Gaggioli A, "Virtual Personal Assistants: An Emerging Trend in Artificial Intelligence," *Cyberpsychology, Behavior, and Social Networking*, Vol. 21, No. 12, pp. 803-804, December 2018. https://doi.org/10.1089/cyber.2018.29133.csi

[4] MIT Technology Review. The Octogenarians Who Love Amazon's Alexa. https://www.technologyreview.com/s/608047/the-octogenarians-who-love-amazons-alexa/

[5] Health Tech. Virtual Assistants Help Seniors Make the Most of Their Golden Years. https://healthtechmagazine.net/article/2017/07/virtual-assistants-help-seniors-make-most-their-golden-years

[6] H. M. Heneveld, "Let's Talk About Embracing Voice Technology," *SDM: Security Distributing & Marketing*, Vol. 48, No. 2, pp. 40, February 2018.

[7] Z. Papacharissi and A. M. Rubin, "Predictors of Internet use," *Journal of broadcasting & electronic media*,

Vol. 44, No. 2, pp. 175-196, June 2010. https://doi.org/10.1207/s15506878jobem4402_2

[8] A. Whiting and D. Williams, "Why people use social media: a uses and gratifications approach," *Qualitative market research*, Vol. 16, No. 4, pp. 362-369, August 2013. https://doi.org/10.1108/QMR-06-2013-0041

[9] E. Lee, J.A. Lee, J. H. Moon, and Y. Sung, "Pictures speak louder than words: Motivations for using Instagram," *Cyberpsychology, Behavior, and Social Networking*, Vol. 18, No. 9, pp. 552-556, September 2015. https://doi.org/10.1089/cyber.2015.0157

[10] G. Seidman, "Self-presentation and belonging on Facebook: How personality influences social media use and motivations," *Personality and individual differences*, Vol. 54, No. 3, pp. 402-407, February 2013. https://doi.org/10.1016/j.paid.2012.10.009

[11] H. Lin and H. Wang, "Avatar creation in virtual worlds: Behaviors and motivations," *Computers in Human Behavior*, Vol. 34, pp. 213-218, May 2014. https://doi.org/10.1016/j.chb.2013.10.005

[12] P. B. Brandtzaeg and A. Følstad, "Why people use chatbots: in *Proc. 4th International conference of internet science*, pp. 377-392, Nov 22-24, 2017.

[13] L. Wulf, M. Garschall, J. Himmelsbach, M. and Tscheligi, "Hands free-care free: elderly people taking advantage of speech-only interaction," in *Proc. 8th Nordic Conference on Human-Computer Interaction: Fun, Fast, Foundational*, pp. 203-206, Oct 26-30, 2014.

[14] A. Reis, H. Paredes, I. Barroso, M. J. Monteiro, V. Rodrigues, S. R. Khanal, and J. Barroso, "Autonomous systems to support social activity of elderly people a prospective approach to a system design," in *Proc. 2016 1st International Conference on Technology and Innovation in Sports, Health and Wellbeing (TISHW)*, pp. 1-5, Dec 1-3, 2016.

[15] J. Hill, W. R. Ford, and I. G. Farreras, "Real conversations with artificial intelligence: A comparison between human–human online conversations and human–chatbot conversations," *Computers in Human Behavior*, Vol. 49, pp. 245-250, August 2015. https://doi.org/10.1016/j.chb.2015.02.026

[16] H. Yang and H. Lee, "Understanding user behavior of virtual personal assistant devices," *Information Systems and e-Business Management*, Vol. 17, No. 1, pp.65-87, June 2018. https://doi.org/10.1007/s10257-018-0375-1

[17] V. A. Zeithaml, "Consumer perceptions of price, quality, and value: a means-end model and synthesis of evidence," *Journal of marketing*, Vol. 52, No. 3, pp. 2-22, July 1988. https://doi.org/10.1177/002224298805200302

[18] K. B. Monroe, *Pricing Making Profitable Decisions*, McGraw-Hill, New York, NY, 1991.

[19] J. J. Cronin, M. K. Brady, R. R. Brand, R. Hightower, and D. J. Shemwell, "A cross-sectional test of the effect and conceptualization of service value," *Journal of services Marketing*, Vol. 11, No. 6, pp. 375-391, December 1997.

[20] J. C. Sweeney, G. N. Soutar, and L. W. Johnson, "Retail service quality and perceived value: A comparison of two models," *Journal of Retailing and Consumer Services*, Vol. 4, No, 1, pp. 39-48, January 1997. https://doi.org/10.1016/S0969-6989(96)00017-3

[21] L. Gao and X. A. Bai, "A unified perspective on the factors influencing consumer acceptance of internet of things technology," *Asia Pacific Journal of Marketing and Logistics*, Vol. 26, No. 2, pp. 211-231, April 2014. https://doi.org/10.1108/APJML-06-2013-0061

[22] V. Demeure, R. Niewiadomski, and C. Pelachaud, "How is believability of a virtual agent related to warmth, competence, personification, and embodiment?" *Presence: Teleoperators and Virtual Environments*, Vol. 20, No. 5, pp. 431-448, October 2011.

[23] J. Moon and Y. Kim, "Extending the TAM for a World-Wide-Web context," *Information and*

Management, Vol. 38, No. 4, pp. 217-230, February 2001. https://doi.org/10.1016/S0378-7206(00)00061-6

[24] E. Lee, J. Lee, M. Cho, Y. Sung, and S. Choi, "The effect of innovativeness and self-regulatory focus on the use of internet of things," *The Korean Journal of consumer and advertising psychology*, Vol. 19, No. 1, pp.67-91, February 2018.

[25] E. Katz, J. G. Blumler, and M. Gurevitch, "Uses and gratifications research," *The public opinion quarterly*, Vol. 37, No. 4, pp. 509-523, 1973.

[26] A. Malik, A. Dhir, and M. Nieminen, "Uses and gratifications of digital photo sharing on Facebook," *Telematics and Informatics*, Vol. 33, No. 1, pp. 129-138, February 2016. https://doi.org/10.1016/j.tele.2015.06.009

[27] B. K. Kaye and T. J. Johnson, "Online and in the know: Uses and gratifications of the web for political information," *Journal of broadcasting & electronic media*, Vol. 46, No. 1, pp. 54-71, June 2010. https://doi.org/10.1207/s15506878jobem4601_4

[28] H. Ko, C. H. Cho, and M. S. Roberts, "Internet uses and gratifications: A structural equation model of interactive advertising," *Journal of advertising*, Vol. 34, No. 2, pp. 57-70, March 2013. https://doi.org/10.1080/00913367.2005.10639191

[29] E. Huang, "Use and gratification in e-consumers," *Internet Research*, Vol. 18, No. 4, pp. 405-426, August 2008.

[30] J. Dimmick, S. Kline, and L. Stafford, "The gratification niches of personal e-mail and the telephone: Competition, displacement, and complementarity," *Communication research*, Vol. 27, No. 2, pp. 227-248, April 2000. https://doi.org/10.1177/009365000027002005

[31] T. F. Stafford and M. R. Stafford, "Identifying motivations for the use of commercial web sites," *Information Resources Management Journal*, Vol. 14, No. 1, pp. 22-30, 2001. https://doi.org/10.4018/irmj.2001010103

[32] J. C. C. Lin, "Online stickiness: its antecedents and effect on purchasing intention," *Behaviour & information technology*, Vol. 26, No. 6, pp. 507-516, June 2008. https://doi.org/10.1080/01449290600740843

[33] X. Luo, "Uses and gratifications theory and e-consumer behaviors: A structural equation modeling study," *Journal of Interactive advertising*, Vol. 2, No. 2, pp. 34-41, July 2013. https://doi.org/10.1080/15252019.2002.10722060

[34] J. Joo and Y. Sang, "Exploring Koreans' smartphone usage: An integrated model of the technology acceptance model and uses and gratifications theory," *Computers in Human Behavior*, Vol. 29, No. 6, pp. 2512-2518, November 2013. https://doi.org/10.1016/j.chb.2013.06.002

[35] N. Park, Y. C. Kim, H. Y. Shon, and H. Shim, "Factors influencing smartphone use and dependency in South Korea," *Computers in Human Behavior*, Vol. 29, No. 4, pp. 1763-1770, March 2013. https://doi.org/10.1016/j.chb.2013.02.008

[36] P. Pai and D. C. Arnott, "User adoption of social networking sites: Eliciting uses and gratifications through a means–end approach," *Computers in Human Behavior*, Vol. 29, No. 3, pp. 1039-1053, May 2013. https://doi.org/10.1016/j.chb.2012.06.025

[37] Y. Cheng, J. Liang, and L. Leung, "Social network service use on mobile devices: An examination of gratifications, civic attitudes and civic engagement in China," *New Media & Society*, Vol. 17, No. 7, pp. 1096-1116, January 2014. https://doi.org/10.1177/1461444814521362

[38] L. Leung, "Generational differences in content generation in social media: The roles of the gratifications sought and of narcissism," *Computers in human behavior*, Vol. 29, No. 3, pp. 997-1006, May 2013.

https://doi.org/10.1016/j.chb.2012.12.028

[39] A. Quan-Haase and A. L. Young, "Uses and gratifications of social media: A comparison of Facebook and instant messaging," *Bulletin of science, technology & society*, Vol. 30, No. 5, pp. 350-361, September 2010. https://doi.org/10.1177/0270467610380009

[40] A. L. Mendelson and Z. Papacharissi, *A Networked Self*, Routledge, pp. 259-281, 2010.

[41] S. Han and H. Yang, "Understanding adoption of intelligent personal assistants: A parasocial relationship perspective," *Industrial Management & Data Systems*, Vol. 118, No. 3, pp. 618-636, April 2018. https://doi.org/10.1108/IMDS-05-2017-0214

[42] I. Ajzen and M. Fishbein, "A Bayesian analysis of attribution processes," *Psychological bulletin*, Vol. 82, No. 2, pp. 261-277, 1975. https://doi.org/10.1037/h0076477

[43] J. Yu, H. Lee, I. Ha, and H. Zo, "User acceptance of media tablets: An empirical examination of perceived value," *Telematics and Informatics*, Vol. 34, No. 4, pp. 206-223, July 2017. https://doi.org/10.1016/j.tele.2015.11.004

[44] O. Turel, A. Serenko, and N. Bontis, "User acceptance of hedonic digital artifacts: A theory of consumption values perspective," *Information & management*, Vol. 47, No. 1, pp. 53-59, January 2010. https://doi.org/10.1016/j.im.2009.10.002

[45] S.C. Chen and C. P. Lin, "The impact of customer experience and perceived value on sustainable social relationship in blogs: An empirical study," *Technological Forecasting and Social Change*, Vol. 96, pp. 40-50, July 2015. https://doi.org/10.1016/j.techfore.2014.11.011

[46] M. Pura, "Linking perceived value and loyalty in location-based mobile services," *Managing Service Quality*, Vol. 15, No. 6, pp. 509-538, December 2005. https://doi.org/10.1108/09604520510634005

[47] H. Yang, J. Yu, H. Zo, and M. Choi, "User acceptance of wearable devices: An extended perspective of perceived value". *Telematics and Informatics*, Vol. 33, No. 2, pp. 256-269, May 2016. https://doi.org/10.1016/j.tele.2015.08.007

[48] N. Niknejad, A. R. C. Hussin, & I. Ghani, "Behavioral Intention to Use Wellness Wearables: A Conceptual Model Development," *International Journal of Internet, Broadcasting and Communication*, Vol. 10, No. 3, pp. 1-10. August 2018. https://doi.org/10.7236/IJIBC.2018.10.3.1

[49] W. B. Dodds, K. B. Monroe, and D. Grewal, "Effects of price, brand, and store information on buyers' product evaluations," *Journal of marketing research*, Vol. 28, No. 3, pp. 307-319, August 1991. https://doi.org/10.1177/002224379102800305

[50] J. C. Sweeney and G. N. Soutar, "Consumer perceived value: The development of a multiple item scale," *Journal of retailing*, Vol. 77, No. 2, pp. 203-220, 2001. https://doi.org/10.1016/S0022-4359(01)00041-0

[51] N. Park, K. F. Kee, and S. Valenzuela, "Being immersed in social networking environment: Facebook groups, uses and gratifications, and social outcomes," *Cyberpsychology & behavior*, Vol. 12, No. 6, pp. 729-733, December 2009. https://doi.org/10.1089/cpb.2009.0003

[52] Y. Kim, J. Jung, and E. Lee, "What drives the adoption and use of smartphone applications," *Korean Journal of Journalism & Communication Studies*, Vol. 55, pp. 227–252, 2011.

[53] N. B. Ellison, C. Steinfield, and C. Lampe, "The benefits of Facebook "friends:" Social capital and college students' use of online social network sites," *Journal of computer-mediated communication*, Vol. 12, No. 4, pp. 1143-1168, August 2007. https://doi.org/10.1111/j.1083-6101.2007.00367.x

[54] A. Joinson, "Looking up, looking at or keeping up with people? Motives and use of Facebook," in *Proc. the Twenty-Sixth Annual SIGCHI Conference on Human Factors in Computing Systems*, pp. 1027-1036, April 5-10, 2008.

[55] S. Alhabash and M. Ma, "A tale of four platforms: Motivations and uses of Facebook, Twitter, Instagram,

and Snapchat among college students?" *Social media+ society*, Vol. 3, No. 1, pp. 1-13, February 2017. https://doi.org/10.1177/2056305117691544

[56] H. W. Kim, H. C. Chan, and S. Gupta, "Value-based adoption of mobile internet: an empirical investigation," *Decision support systems*, Vol. 43, No. 1, pp. 111-126, February 2007. https://doi.org/10.1016/j.dss.2005.05.009

[57] S. J. Hong and K. Y. Tam, "Understanding the adoption of multipurpose information appliances: The case of mobile data services," *Information systems research*, Vol. 17, No. 2, pp. 162-179, June 2006. https://doi.org/10.1287/isre.1060.0088

[58] D. A. Ferguson and E. M. Perse, "The World Wide Web as a functional alternative to television," *Journal of broadcasting & electronic media*, Vol. 44, No. 2, pp. 155-174, June 2010. https://doi.org/10.1207/s15506878jobem4402_1

[59] G. Schuitema, J. Anable, S. Skippon, and N. Kinnear, "The role of instrumental, hedonic and symbolic attributes in the intention to adopt electric vehicles," *Transportation Research Part A: Policy and Practice*, Vol. 48, pp. 39-49, February 2013. https://doi.org/10.1016/j.tra.2012.10.004

[60] D. Gefen, "E-commerce: the role of familiarity and trust," *Omega*, Vol. 28, No. 6, pp. 725-737, December 2000. https://doi.org/10.1016/S0305-0483(00)00021-9

[61] S. Y. Komiak and I. Benbasat, "The effects of personalization and familiarity on trust and adoption of recommendation agents," *MIS quarterly*, Vol. 30, No. 4, pp. 941-960, December 2006. https://doi.org/10.2307/25148760

[62] W. Wang and I. Benbasat, "Attributions of trust in decision support technologies: A study of recommendation agents for e-commerce," *Journal of Management Information Systems*, Vol. 24, No. 4, pp. 249-273, December 2014. https://doi.org/10.2753/MIS0742-1222240410

[63] A. M. Seeger, J. Pfeiffer, and A. Heinzl, "When do we need a human? Anthropomorphic design and trustworthiness of conversational agents," in *Proc. Sixteenth Annual Pre-ICIS Workshop on HCI Research in MIS*, pp. 1-6, Dec 10, 2017.

[64] H. F. Lin, "An empirical investigation of mobile banking adoption: The effect of innovation attributes and knowledge-based trust," *International journal of information management*, Vol. 31, No. 3, pp. 252-260, June 2011. https://doi.org/10.1016/j.ijinfomgt.2010.07.006

[65] R. H. Walker and L. W. Johnson, "Towards understanding attitudes of consumers who use internet banking services," *Journal of Financial Services Marketing*, Vol. 10, No. 1, pp. 84-94, September 2005. https://doi.org/10.1057/palgrave.fsm.4770175

[66] D. Sirdeshmukh, J. Singh, and B. Sabol, "Consumer trust, value, and loyalty in relational exchanges," *Journal of marketing*, Vol. 66, No. 1, pp. 15-37, January 2002. https://doi.org/10.1509/jmkg.66.1.15.18449

[67] J. K. Rempel, J. G. Holmes, and M. P. Zanna, "Trust in close relationships,". *Journal of personality and social psychology*, Vol. 49, No. 1, pp. 95-112, July 1985.

[68] K. E. Schaefer, T. L. Sanders, R. E. Yordon, D. R. Billings, and P. A. Hancock, "Classification of robot form: Factors predicting perceived trustworthiness," in *Proc. the human factors and ergonomics society 56th annual meeting*, pp. 1548-1552, Sep 1, 2012.

[69] A. M. Al-Momani, M. A. Mahmoud, and M. Sharifuddin, "Modeling the adoption of internet of things services: A conceptual framework," *International Journal of Applied Research*, Vol. 2, No. 5, pp. 361-367, 2016.

[70] H. Yang, "User acceptance of virtual personal assistant devices: An extended perspective of perceived value," *Journal of The Korea Contents Association*, Vol. 17, No. 10, pp. 179-189, October, 2017.

https://doi.org/10.5392/JKCA.2017.17.10.179

[71] R. Weston and P. A. Gore Jr., "A brief guide to structural equation modeling" *The counseling psychologist*, Vol. 34, No. 5, pp. 719-751, September 2006. https://doi.org/10.1177/0011000006286345

[72] R. P. Bagozzi and Y. Yi, "On the evaluation of structural equation models," *Journal of the academy of marketing science*, Vol. 16, No. 1, pp. 74-94, March 1988. https://doi.org/10.1007/BF02723327

[73] J. F. Hair, M. Sarstedt, C. M. Ringle, and J. A. Mena, "An assessment of the use of partial least squares structural equation modeling in marketing research," *Journal of the academy of marketing science*, Vol. 40, No. 3, pp. 414-433, June 2011. https://doi.org/10.1007/s11747-011-0261-6

[74] J. C. Anderson and D. W. Gerbing, "Structural equation modeling in practice: A review and recommended two-step approach," *Psychological bulletin*, Vol. 103, No. 3, pp. 411-423, May 1988.

[75] C. Fornell and D. F. Larcker, "Evaluating structural equation models with unobservable variables and measurement error," *Journal of marketing research*, Vol. 18, No. 1, pp. 39-50, February 1981. https://doi.org/10.1177/002224378101800104

[76] L. K. Cui and W. K. Kim, "For wearable device user experience and user concerns of the elements of the evaluation - Focused on the Wearable Device and Fitbit Flex," *Journal of Digital design*, Vol. 15, No. 1, pp. 256-264, January, 2015.

[77] Forbes. 14 Ways AI will benefit or harm society. https://www.forbes.com/sites/forbestechcouncil/2018/03/01/14-ways-ai-will-benefit-or-harm-society/#546052564ef0

[78] A. Bhati, M. Hansen, and C. M. Chan, "Energy conservation through smart homes in a smart city: A lesson for Singapore households," *Energy Policy*, Vol. 104, pp. 230-239, May 2017. https://doi.org/10.1016/j.enpol.2017.01.032

[79] Forbes. Alexa? How voice-first technology helps older adults. https://www.forbes.com/sites/nextavenue/2018/05/04/alexa-how-voice-first-technology-helps-older-adults/#5b74088dca96

[80] E. Lee, J. Lee, and Y. Sung, "Effect of use's characteristics and perceived value on VPA satisfaction," *The Korean Journal of consumer and advertising psychology*, Vol. 20, No. 1, pp. 31-53, February 2019.