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Impact of Telepresence Levels on Internet Advertising Effects

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ABSTRACT

This study examined the dimensions of interactivity and vividness to propose three telepresence levels: content presence, social presence, and personal presence. Then, an experiment investigated the impact of different telepresence levels on Internet advertising. The effects of interactions between vividness of visual imagery (VVI) and product types in relation to telepresence levels and advertising effects were also analyzed. The study employed a factorial design: 4 (levels of telepresence) × 2 (product types) × 2 (VVI). Levels of telepresence and product types were both manipulated between subjects. VVI was measured within subjects. Experimental findings showed that high levels of telepresence of an Internet advertisement increased subject recall and recognition. The low VVI respondent group would have greater recognition than traditional advertisements when respondents were exposed above the level 2 (social presence) advertisement and the effect of recognition increased from level 1 (content presence) to level 3 (personal presence). Recognition increased from level 1 (content presence) to level 2 (social presence) for both search and experience product groups; however, only recognition of the experience product group increased in level 3 (personal presence).

INTRODUCTION

THE VIRTUAL EXPERIENCE has advanced because technology has led to a more realistic sensory experience online.[1] Li et al.[2] define telepresence as psychological states that consumers enter while interacting with three-dimensional (3D) products in computer-mediated environments. Virtual experiences may change consumers' buying behaviors. For example, consumers can use virtual models to try on different clothing (e.g., at Landsend.com), almost as if they were at a physical store. Virtual experience can be conceptualized by telepresence,[2,3] and our understanding of consumer responses to virtual product experiences is still in its infancy.[4–6]

The determinants of telepresence are interactivity and vividness[4]—namely, different combinations of interactivity and vividness characterize different levels of telepresence; however, we currently lack the ability to design different degrees of telepresence. Previous studies of Internet advertising effectiveness typically examined interactivity and vividness separately. For example, Raman,[7] Fortin,[8] and Klein[9] explored interactivity of Internet advertising. Li et al.[1] showed that high degrees of vividness in 3D advertising increased advertising effectiveness. Only Coyle and Thorson[10] considered both interactivity and vividness in the same study; however, they examined these two characteristics separately. The primary concern of practitioners is to understand how to design extremely effective Internet advertising that employs interactivity and vividness.

A high degree of interactivity in an advertisement may require a certain level of vividness to motivate consumers to click on it. Conversely, high

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degrees of vividness, such as in 3D advertising, require high levels of interactivity to motivate customers to browse. This study argues that examining interactivity and vividness in the context of telepresence can elucidate important issues in Internet advertising design.

This study has three purposes. First, levels of telepresence are developed. Second, the study empirically examines the impact of these levels on advertising effects. Third, the study uses product types and image vividness as moderators between levels of telepresence and advertising effects.

Telepresence

Telepresence is the feeling of "being there" that an individual experiences in communication media environments. Vividness and interactivity are two primary variables that characterize telepresence.[4] In this study, telepresence is further defined to include an individual's perception of an experience through a media environment. Such environments could be temporary or real surroundings located at a distance far from the user (such as a real image presented through a camera). Telepresence may be a computer-generated world such as those in computer games.

Several researchers have developed relevant viewpoints regarding the dimensions of telepresence; however, their definitions of telepresence are unclear. Schubert et al.[11] and Lessiter et al.[12] propose the following three dimensions of telepresence:

- **Involvement/engagement:** Motivation to become involved (using media)
- **Spatial presence/physical space:** Perception while engaged in media and virtual environments
- **Judgment of realness/naturalness:** Degree of similarity to real events or entities

Researchers regard vividness and interactivity as the two principal variables that influence telepresence.[4,13–15] Steuer[4] proposes that sensory breadth and depth are the two dimensions of vividness. Gibson[16] further defines five perception systems: auditory, haptic, touch, taste-smell, and visual. Sensory breadth is the number of sensory dimensions presented simultaneously, and sensory depth is the resolution of these perceptual channels.[4] For example, television employs visual and auditory channels, whereas radio only uses the auditory channel. Television, then, has a greater breadth than radio. Media technology also influences sensory depth.

Interactivity is the extent to which users can participate in modifying the form and content of a mediated environment in real time.[17,18] The variables that contribute to interactivity are speed, range, and mapping.[4] Speed refers to the rate at which input can be assimilated into a mediated environment. For instance, the time required to reply to e-mail is less than that needed for traditional mail. Range refers to the number of possibilities in an action at any given time; for example, the range of a video machine is greater than that of a television set. A video machine can move a program forward or backward and pause, whereas a television can only be turned on or off. Mapping denotes the ability of a system to map its controls to changes in the mediated environment in a natural and predictable manner.

Determinants of telepresence

Several studies on telepresence[4,13–15] identify vividness and interactivity as the two major determinants of telepresence. This study utilizes these two determinants to develop three levels of telepresence, ranging from low to high.

Vividness

Steuer[4] argues that the breadth and depth of a perception system contribute to its vividness. Breadth is the number of perception channels in a medium at a specific point in time, whereas depth is the quality of perceptive information. Gibson[16] identifies five systems of perception: basic orienting, auditory, touch, visual, and taste-smell. Based on Gibson's analysis and the technology used in website design, three levels of depth for each perceptional system were developed (Table 1).

Interactivity

Rafaeli[18] defines interactivity as "an expression of the extent that, in a given series of communication exchanges, any third (or later) transmission (or message) is related to the degree to which previous exchanges referred to even earlier transmissions." Here, interactivity was a one-dimensional aspect of message responsiveness,[17,18] and there was a lack of measurement of interactivity.[19] Anderson,[20] Ha and James,[21] Heeter,[19,22] and Ku[23] theorize interactivity as a multidimensional construct. The concept of interactivity can be defined as interaction with media,[19,21,22] a communication process,[23] and a method of controlling a message.[20]

TABLE 1. DEPTH OF EACH PERCEPTIONAL SYSTEM

Perceptional System	*Depth of perceptional system*	*Description*
Orienting system	Low	The WWW advertisement only provides text description and picture about product.
	Middle	The WWW advertisement provides forum and online chatting, besides contain in the low level.
	High	The WWW advertisement provides VR environment, besides contain in the middle level.
Visual system	Low	The WWW advertisement provides 2D picture.
	Middle	The WWW advertisement provides 2D animation, besides contain in the low level.
	High	The WWW advertisement provides 3D VR, besides contain in the middle level.
Auditory system	Low	The WWW advertisement doesn't provide any sound effects.
	Middle	The WWW advertisement provides background music.
	High	Besides contain in the middle level, the WWW advertisement provides simulate sound effects when users manipulate the product on the web.
Touch system	Low	The WWW advertisement provides text description and picture about products and users can click them.
	Middle	Besides contain in the low level, the WWW advertisement provides product's animation, and users can control it.
	High	The WWW advertisement provides 3-D product image which users can rotate, zoom in or zoom out, and move the product.
Taste-smell system	Because the taste-smell technology isn't a popular technology for PC, we didn't discuss this system in this study.	

The characteristics of interactive communication theory as defined by Dance,[24] Rogers,[25] and Rice[26] are participant equity, dynamic communication process, control of message, and mutual understanding. The following 10 dimensions of interactivity (boldfaced) are based on these characteristics.

Participant equity characteristics

The **exchange of roles** refers to the ability of person A to assume the position of person B and perform communication acts for person B, and vice versa, and the extent participant can express their opinions at any time during the communication process.[19,27–29]

Communication linkage refers to the extent individuals can be linked together by a medium during the communication process.[21,23,30]

Dynamic process characteristics

Immediacy of feedback is the extent feedback can be received quickly.[20,23,27,31]

Controlling of process is the extent a participant is able to stop the communication process.[23,25,27,28,31–34]

Dialog is the extent participants feel dialogue each other person to person.[21,24,29,35]

Message controlling characteristics

Controlling of content is the extent participants can choose, add, and store content.[19,21,29,31,33,34]

Personalization is the extent communication is personalized.[20,27,35]

Responsiveness is the extent any third or later message in a given series of communication exchanges is associated with the way previ-

ous exchanges are related to even earlier ones' messages.[19,28,30,32,36]

Mutual understanding characteristics

Social presence is the extent users perceive others to be psychologically present when interacting through a communication medium.[21,27,38]

Mutual understanding is the extent participants understand the content of communication.[19,25]

This study integrates the characteristics of vividness and interactivity into the three different levels of telepresence: content presence, social presence, and personal presence (Table 2).

Several studies have shown that telepresence can enhance persuasion, memory, virtual experience, and advertising intent.[6,9,10] However, these effects can be influenced by the vividness of visual imagery (VVI) and product types.

Vividness of visual imagery and advertising effects

Marks[39] uses a self-reported imagery test in developing a specific questionnaire, Vividness of Visual Imagery Questionnaire (VVIQ). VVIQ measures a number of processes such as the retrieval of visual images from memory. VVIQ is the most effective scale for measuring short-term memory. Several subsequent studies have identified the positive relationship between VVIQ scores and visual memory performance.[40–42] Consequently, advertising with enhanced vividness is required to attract consumers with poor visual imagery.

Product types and advertising effects

In discussing the impact of interactive mediums on advertising effects, Klein[3] notes that the theoretical classification of search/experience products is a good product classification system for the Internet. Nelson[43] defines search products as those characterized by product attributes for which information can be acquired prior to product use. Experience products are those characterized by attributes which cannot be known prior to product use or for which information searching was more costly or difficult than direct product experience. The quality of search products can be assessed by information searching, whereas the quality of experience products can only be judged after consuming.[44]

A consumer can obtain virtual experience through advertising, such as experiencing a product first-hand, completing a product transaction, or having a virtual experience which is significantly similar to direct product experience.[3] Experience product characteristics thus can be similar to those of search products. This conflation of characteristics can reduce consumer purchase risk, increase the percentage of the attribute of searching experience, and modify the weight of experiential attribute for consumer decisions.[3] This study proposes that the effects of Internet advertising are dependent on product types.

Conceptual model

After combining with vividness and interactivity, this study analyzes three levels of telepresence as variables for Internet advertising effects. Additionally, the moderating effect of product typologies and vividness of visual imagery are analyzed to determine the relationship between the level of telepresence and advertising effect (Fig. 1).

Consumers who actively interact with website advertising are either goal-oriented or experience-oriented and their interaction that may correspond to situational or personal involvement.[5] According to the Elaboration Likelihood Model (ELM),[45] there are two persuasion routes that consumers follow when they encounter persuasive communication: a central route and a peripheral route. When consumers have high level of involvement with goals and an ability to process communication, consumers will exert considerable cognitive effort processing the information. In this high elaboration likelihood situation, central cues are important in determining persuasion effects. In our study, consumers need to exert more effort interacting and processing high vividness in the Internet advertising with higher levels of telepresence, which may serve as central routes. Consequently, using ELM,[45] a high level of telepresence generates high cognitive effects for advertisements. The following hypothesis is generated: **H1: Telepresence levels are directly associated with Internet advertising recall and recognition levels.**

Moderating effects of VVI

Visual imagery refers to the ability to visualize, namely, the ability to form mental pictures, or to "see in the mind's eye." An individual with a higher degree of VVI has better recall than a person with a low degree of VVI.[39,46] The VVIQ[39,46] is the measurement of the individual differences in VVI. Given the same vividness of an advertisement, individuals who scored high on the VVIQ have better image recall and recognition than

TABLE 2. CHARACTERISTICS OF EACH LEVEL OF TELEPRESENCE

	Telepresence level		
	Level 1, content presence, low	*Level 2, social presence, middle*	*Level 3, personal presence, high*
Vividness	Orienting system: low Auditory system: low Touch system: low Visual system: low	Orienting system: middle Auditory system: middle Touch system: middle Visual system: middle	Orienting system: high Auditory system: high Touch system: high Visual system: high
Interactivity	Controlling of process Controlling of content	Controlling of process Controlling of content Communication linkages Responsiveness Dialog Exchange of roles Social presence	Controlling of process Controlling of content Communication linkages Responsiveness Dialog Exchange of roles Social presence Immediacy of feedback Personalization Mutual understanding
Dimensions of Telepresence	Involvement/ engagement: low Spatial presence/ physical space: low Judgment of realness/ naturalness: low	Involvement/ engagement: middle Spatial presence/ physical space: middle Judgment of realness/ naturalness: middle	Involvement/ engagement: high Spatial presence/ physical space: high Judgment of realness/ naturalness: high

those who scored low. This study further proposed that a high degree of telepresence is not necessary to achieve good effects from vivid advertising for individuals who have high VVIQ scores. Thus, a second hypothesis is proposed: **H2: Vividness of visual imagery (VVI) moderates the impact of levels of telepresence on recall and recognition for Internet advertising.**

Moderating effects of product types

Klein[3] argues that Nelson's[43] classification of search products and experience products can be applied to analyze the affects of media on advertising effect.

The advantage of telepresence for search products is that Internet advertising, through interactive media, provides easier retrieval, low research costs, and increased amounts of customized information,[3] reduces the amount of irrelevant information, and organizes information. As for experience products, the advantages of telepresence are that a virtual experience is produced, and product characteristics of experience products are transformed into search product characteristics. The transfer paths can be identified by evaluating the level of telepresence as follows.

- **Level 1:** Content presence can structure information, make consumers more easily research information, reduce research cost of attributes, and alter the characteristic of dominant attributive research difficulty for experience products.
- **Level 2:** Social presence can generate a 2-D virtual presence for products, background music and consumer discussions, cause consumers to enjoy the product advertising, share usage experience in comfortable surroundings and, consequently, create a virtual experience.
- **Level 3:** Personal presence can create individual experience for product use (such as online trials and online product selection), change attributes weight, change dominant degree of experience products attributes, and reduce the experience products not be dominated by experience attribute any more.

Thus, when consumers with high levels of telepresence interact with experience products, they can obtain more benefits from the transfer of

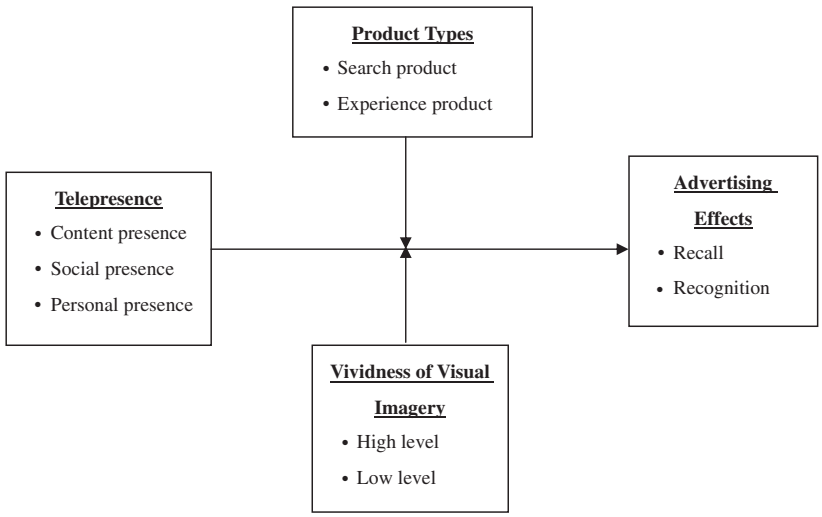

FIG. 1. Conceptual model.

experience attributes to search attributes than when interacting with search products. Hence, the effect of telepresence on experience goods is greater than that on research products. The following hypothesis is proposed: **H3: Product types moderate the impact of levels of telepresence on the recall and recognition of Internet advertising.**

METHODS

Participants and stimulus

A total of 221 subjects participated in this study. Respondents were university students in Taipei, Taiwan. The study employed a factorial design: 4 (levels of telepresence) × 2 (product types) × 2 (VVI). Levels of telepresence and product types were both manipulated between subjects. Vividness of visual imagery was measured within subjects.

All participants were majoring in business-related fields. Participants were randomly assigned to eight groups. Prior to the start of the experiment, each subject was shown the website to eliminate the novelty effect during the experiment.

Level 1 telepresence (content presence) comprised VS1 (a search product) and VE1 (an experience product) with two-dimensional (2D) low-resolution images, FAQs and hyperlinks (Table 3).

Level 2 telepresence (social presence) comprised VS2 (a search product) and VE2 (an experience product) with a 2D image (using Flash software with motion), background music, a discussion forum, FAQs and hyperlinks.

Level 3 telepresence (personal presence) comprised VS3 (a search product) and VE3 (an experience product) with personal recommendations, background music, a discussion forum, FAQs, hyperlinks, and a 3D product image which users can rotate, zoom in or zoom out, and move the product (Cult 3D software).

The level 0 as control groups employed VS0 (search product) and VE0 (experience product) and displayed all information in a linear fashion.

Pretest and dependent measures

In the pretest, two of 10 product categories—cloth, notebook computer, wristwatch, shoes, flower, cosmetic, restaurant, camera, PDA, mobile phone categories—were chosen, one as a search product and one as an experience product. A questionnaire containing 10 questions (one product, one question) as to whether, when purchasing these products, it is easy to judge their qualities or not was administered. The questionnaire employed a five-point Likert scale before actual using it with 50 subjects.

An analysis of variance (ANOVA) shows that scores for different products are significantly different (p = 0.001). A Duncan's multiple comparison was applied to the 10 products. Four groups from low to high scores are (1) cosmetic, restaurant, and notebook computer; (2) restaurant, notebook computer, PDA, and digital camera; (3) notebook computer, PDA, digital camera, clothes, flower, wristwatch, and shoes; and (4) PDA, digital camera, clothes, flower, wristwatch, shoes, and mobile phone.

The lower scores for a product, the greater it is a search product. The higher scores for a product, the greater it is an experience product. The three

TABLE 3. TELEPRESENCE LEVELS IN THE EXPERIMENT

Advertisement	*Telepresence levels*	*Vividness dimensions (ad design)*	*Interactivity dimensions (ad design)*
VS1 VE1	Level 1, content presence	Orienting system: low, auditory system: low visual system: low (2D picture with low resolution)	Controlling of process, controlling of content, immediacy of feedback and communication linkages (FAQ and hyperlinks)
VS2 VE2	Level 2, social presence	Orienting system: middle, auditory system: middle, touch system: middle, and visual system: middle (2D picture using Flash software with motion picture and background music	Controlling of process, controlling of content, immediacy of feedback, communication linkages (FAQ and hyperlinks), responsiveness, dialog, exchange of roles, and social presence (discussion forum)
VS3 VE3	Level 3, personal presence	Orienting system: high, auditory system: high, touch system: high, visual system: high (3D product display and background music)	Controlling of process, controlling of content, immediacy of feedback, communication linkages (FAQ and hyperlinks), responsiveness, dialog, exchange of roles, social presence (discussion forum), and personalization (personal recommedation)
VS0 VE0	Level 0, without telepresence	NA	NA

products with the lowest scores were cosmetic, restaurant, and notebook computer. The three products with the highest scores were wristwatch, shoes, and mobile phone. The notebook computer and wristwatch were chosen for experimental products because respondents were more familiar with these products than the others.

Fictitious brands were used for the products: ArchTimes wristwatch (search product) and HighPerformance notebook computer (experience product).

Vividness of visual imagery was measured with the VVIQ.[39] The score of VVIQ was used to divide the samples into high and low levels of vividness for the visual imagery groups.

Recall and recognition were considered the measures of advertising effectiveness. Recall was assessed by asking participants if they remembered the product names, brand names, and the three arguments for the products. Experience product copy emphasized excellent service, good mobile partner, good tool for success, fashionable, and excellent service. We used the same questions (multiple choice) as the recognition measure.

Procedure

Six experimental sessions were conducted in a computer laboratory. Subjects were allowed prac-

tice sessions using a homepage similar to the test homepage that would familiarize them with a web environment and the hyperlinks for navigation. Participants were randomly assigned to either a search or an experience product website when they entered the experimental website address. All browser functions were disabled to stop participants from returning to a web page. First, participants recorded their gender, Internet use experience, product involvement,[47] and VVIQ, and answered a question about buying these products. Answers were judged on a five-point Likert scale. After answering the above part of the questionnaire, the web server randomly assigned the subject to the advertisement for one of four levels of telepresence. After browsing the experimental advertisement, the second part of the questionnaire queried participants on telepresence, recall, and recognition for the advertisement.

RESULTS

Manipulation checks

After omitting the uncompleted questionnaires from the study, there were 152 valid samples. First, reliability analysis by Cronbach α of telepresence and VVIQ was conducted. Cronbach α for the telepresence scale was 0.8836 and 0.9581 for VVIQ; both showed good reliability.

The ANOVA test of the telepresence scale showed that the four levels were significantly different (p value = 0.00 < 0.05). Duncan's multiple comparison showed that level 0 versus level 1, level 1 versus level 2, and level 2 versus level 3 were significantly different.

The ANOVAs values for web use experience (p = 0.202) and product involvement (p = 0.257) were not significant, suggesting that experience and involvement had no effect on this experiment.

We also used the same question during the pretest to evaluate the manipulation of product types, showing that two products were significantly different (p = 0.001).

Levels of telepresence and advertising effects

The impact of levels of telepresence on advertising effect was tested by ANOVA. Recall results showed the levels of telepresence had significantly different impacts (F = 15.234, p = 0.000 < 0.05). Recognition results showed that the levels of telepresence also had significantly different impacts (F = 16.281, p = 0.000 < 0.05). Duncan's multiple comparison showed that a high level of telepresence produces high recall and recognition (Table 4). Consequently, H1 was confirmed.

Interaction of vividness of visual imagery and levels of telepresence on advertising effects

First, the interaction of VVI and levels of telepresence on advertising effect were assessed with ANOVA tests. The interaction of VVI and levels of telepresence on recall were not significantly different (F = 2.451, p = 0.066). Conversely, the interaction of VVI and levels of telepresence on recognitions were significantly different (F = 4.516, p = 0.005).

The means of recognition in low levels of VVI group from the level 0 to level 3 were 2.00, 2.67, 3.57, and 6.22, respectively (F = 15.614, p = 0.000). Duncan's multiple comparison showed that the rates of recognition in level 0 versus level 2, and level 2 versus level 3 were significantly different (Table 5). We can confirm that the VVI group would have greater recognition than traditional advertisements when respondents were exposed above the

TABLE 4. LEVELS OF TELEPRESENCE AND ADVERTISING EFFECTS

Levels of telepresence / *Advertising effect*	*Level 0(a)*	*Level 1(b)*	*Level 2(c)*	*Level 3(d)*	*Duncan significant effect*[a]
Recall	0.29	1.05	1.67	2.30	(a,b) < (b,c) < (c,d)
Recognition	1.65	2.71	3.78	4.80	a < b < c < d
Sample size	34	42	36	40	

[a]Means between groups were significantly different and within group were not.

TABLE 5. DUNCAN MULTIPLE COMPARISON FOR VIVIDNESS OF VISUAL IMAGERY (VVI) AND LEVELS OF TELEPRESENCE ON RECOGNITION

Advertising effect \ *Levels of telepresence*	*Level 0(a)*	*Level 1(b)*	*Level 2(c)*	*Level 3(d)*	*Duncan significant subsets*[a]
Low VVI					
Recognition	2.00	2.6667	3.57	6.22	(a, b) < (b, c) < (d)
Sample size	15	24	14	18	
High VVI					
Recognition	1.37	2.78	3.91	3.63	a < (b, c, d)
Sample size	34	42	36	40	

[a]Means between groups were significantly different and within group were not.

level 2 telepresence advertisement, and the effect of recognition increased from level 1 to level 3.

The means of recognition in the high VVI group from the level 0 to level 3 were 1.37 were 2.78, 3.91, and 3.63, respectively, showing significant difference by ANOVA ($F = 7.138$, $p = 0.000$). Duncan's multiple comparison showed that level 0 is significantly lower in recognition than levels 1, 2, and 3; however, there was no significant difference between levels 1, 2, and 3. The result confirmed that the high VVI group had better recognition than traditional advertisements when respondents were exposed to telepresence levels 1 and 2; however, the highest level of telepresence did not increase recognition effects.

The interaction of VVI and levels of telepresence was also examined (Fig. 2). The plot graph shows that, regardless of how high or low VVI is, recognition increases from level 0 to level 2, but only low VVI still increases in level 3. This result partially confirmed H2.

Interaction of product types and levels of telepresence on advertising effects

The interaction of product type and levels of telepresence on recall was significantly different ($F = 3.647$, $p = 0.014$). The means of recall of search product group for levels 0, 1, 2, and 3 were 0.42, 1.08, 1.68, and 1.3, respectively ($F = 2.589$, $p = 0.059$). Duncan's multiple comparison showed that manipulations of recalls in level 0 versus level 2, and level 2 versus level 3 were significant different.

The means for experience products in levels 0, 1, 2, and 3 were 0.13, 1.00, 1.65, and 3.3, respectively ($F = 7.535$, $p = 0.000 < 0.05$). Duncan's multiple

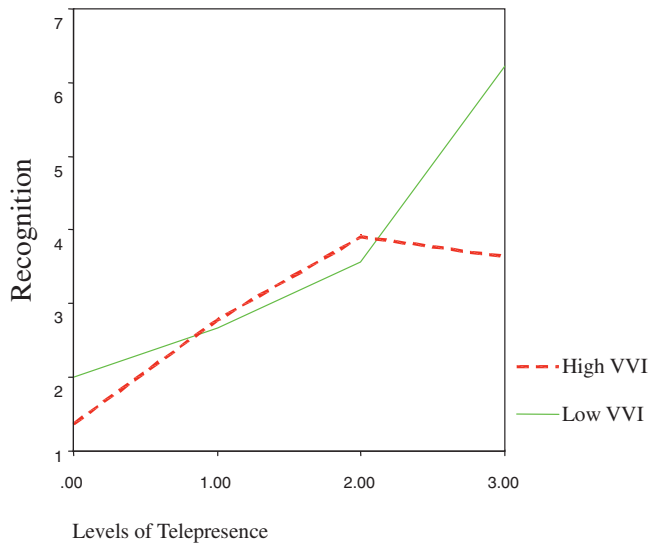

FIG. 2. Interaction plot of vividness of visual imagery and levels of telepresence on recognition.

TABLE 6. DUNCAN MULTIPLE COMPARISON FOR PRODUCT TYPES AND TELEPRESENCE LEVELS ON ADVERTISING EFFECTS

Levels of telepresence / *Advertising effect*	*Level 0(a)*	*Level 1(b)*	*Level 2(c)*	*Level 3(d)*	*Duncan significant effect*[a]
Search product					
Recall	0.42	1.08	1.68	1.30	(a) < (b, c, d)
Recognition	2.21	2.75	3.78	3.90	(a, b) < (b, c, d)
Sample	19	24	19	20	
Experience product					
Recall	0.13	1.00	1.65	3.30	(a, b) < (b, c) < d
Recognition	0.93	2.67	3.77	5.70	(a, b) < (b, c) < d
Group size	15	18	17	20	

[a]Means between groups were significantly different and within group were not.

comparison showed that the recalls in level 0 versus level 2, and level 2 versus level 3 were significantly different (Table 6). Consequently, experimental results confirmed that the experience product group had greater recall for internet advertisement than for traditional advertisement when respondents were exposed to level 3 telepresence advertisements, and the effect of recalls increased from level 1 to level 3.

The interaction of product types and levels of telepresence were plotted in a graph (Fig. 3). The graph shows that recall increases from level 0 to level 2 for both search and experience products; however, only experience product increases in level 3. This result confirmed H3.

The interaction of product type and levels of telepresence on recognition was significantly different ($F = 3.808$, $p = 0.012$). The means of recognitions of search product group in levels 0, 1, 2, and 3 were 2.21, 2.75, 3.78, and 3.90, respectively ($F = 3.78$, $p = 0.014$). Duncan's multiple comparison showed that the means of level 0 versus level 2, and level 2 versus level 3 were significantly different. The means of the experience product group for level 0, 1, 2, and 3 were 0.93, 2.67, 3.77, and 5.70, respectively ($F = 15.52$, $p = 0.000 < 0.05$). These findings confirmed that the experience product group had greater recognition effects than traditional advertisement when consumers were exposed to the advertisement in telepres-

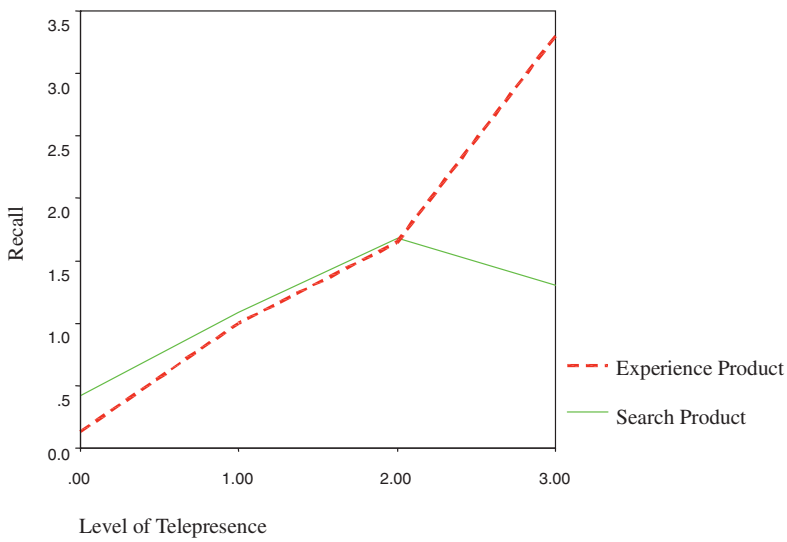

FIG. 3. Interaction plot of product types and levels of telepresence on recall.

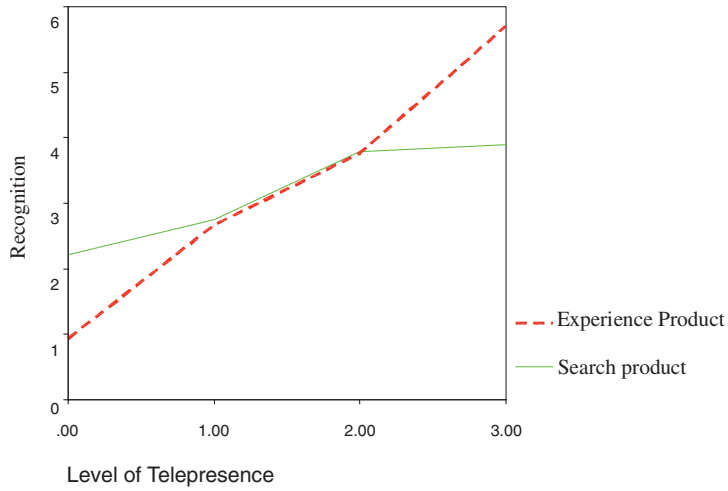

FIG. 4. Interaction plot of product types and levels of telepresence on recognition.

ence level 3, and the effect increased from level 1 to level 3.

The interaction of product types and levels of telepresence were examined (Fig. 4). Recognition increased from level 0 to level 2 for both search and experience products; however, only recognition of the experience product increased in level 3. The analyses of recall and recognition of experimental advertisements confirmed H3.

DISCUSSION

This study verified that virtual experience enhances the effects of Internet advertising. This study employed three levels of telepresence: content presence, social presence, and personal presence. Experimental results showed that a high level of telepresence in Internet advertising produces increased advertisement recall and recognition. Examining the interaction effects between telepresence levels and VVI on Internet advertising effects determined that, with high levels of VVI, individuals could cognitively process information without higher levels of telepresence. Level 2–social presence was enough for subjects' cognitions. However, with low VVI individuals, higher levels of telepresence were needed to help them process the cognitive advertising effects.

Examination of the interaction between telepresence levels and product types on Internet advertising effects showed that the experience-search classification is more effective than traditional involvement product classifications. The effect of high levels of telepresence on experience products was empirically examined. Experimental results showed that consumers can obtain more benefit from the transfer of experience attributes to search attributes than from search products alone. High levels of telepresence were needed for experience product to transform their attributes; however, level 2–social presence was enough for consumers to learning about search products.

When marketers design Internet advertisements for consumers with VVI are high, level 2–social presence (which uses 2D Flash images, background music, and hyperlinks) can be effective. For consumers with low VVI, providing hyperlinked pages, FAQs, discussion forums, personal recommendations, 3D product display, and background music (i.e., level 3–personal presence) are necessary for consumers. If advertisements are selling search products, level 2–social presence is sufficient for Internet advertising. For experience products, it is necessary to design advertisements with high levels of telepresence; Level 3–personal presence is the best level for experience products.

This research focuses only on web advertising. Banner and e-mail ads are not examined. Using only college students as study subjects limits the external validity of the study. Further studies should examine telepresence levels in a real website environment. According to Hoffman and Novak,[5] different browsing behaviors (such as goal-oriented and experiential behaviors) may have different advertising effects.

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