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THE EFFECT OF IMPLICIT PERCEIVED DECEPTIVENESS ON ATTITUDES TOWARD ADVERTISEMENTS: MEASURING PERCEIVED DECEPTIVENESS, USING THE GO/NO-GO ASSOCIATION TASK

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Abstract

In this research, we measured implicit perceived deceptiveness through the Go/No-go Association Task (GNAT), which is an implicit measure developed by Nosek and Banaji (2001). We also examined the task's validity, so as to counter the deceptiveness that could be elicited by the measurement of deceptiveness through a questionnaire. In the experiment, we measured implicit perceived deceptiveness, explicit perceived deceptiveness, brand attitude, and product evaluation, based on an advertisement, then examined the relationships between these variables. Explicit deceptiveness was measured through a free writing task relating to the advertisement, so as to avoid arousing the participants' suspicions. A correlation analysis did not indicate a correlation between implicit perceived deceptiveness and explicit perceived deceptiveness. In addition, a hierarchical multiple regression analysis showed that implicit perceived deceptiveness did not influence brand attitude; instead, the former was found to influence product evaluation. Implicit perceived deceptiveness, as measured through the GNAT, was shown to be partially valid.

Key words: perceived deceptiveness, Go/No-go Association Task (GNAT), implicit measures, advertisement

1. Introduction

When viewing advertisements, everyone has once questioned the truthfulness of the advertisements. This issue of deception in the marketplace has been pointed out for years. For example, Huff (1954) suggested that it is possible to change ad readers' evaluations by cunningly distorting or concealing statistical results. Much of the techniques he refers to in that book are not to resort to

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blatant lying, but rather to confuse people without telling a lie by exploiting the readers' biases or stereotypes. Though such techniques do not use blatant lying, they should be regarded as deceptive because they have the intention to mislead the readers.

In recent years, due to the development of studies on persuasion, techniques to increase the effect of persuasion on consumers have been used in the marketplace (e.g., Cialdini, 2008; Pratkanis & Aronson, 1992). There would be no issue if marketers used these persuasion techniques sincerely, but Boush, Friestad, & Wright (2009) point out that these techniques could be turned into "corrupted persuasion tactics" when used with deception. Incorrect presentations, omissions, concealment, and lies are often used in advertisements to trick consumers into changing their attitudes toward products and buying them in line with the intention of marketers.

Although it seems possible to regulate such deception in the marketplace, it is often overlooked. For example, Japanese criminal law stipulates that a mere falsehood as a commercial strategy is not punishable by law (Fujiki & Funayama, 2013). Especially if it is malicious, the municipality can issue administrative punishment as a violation of the Law for the Prevention of Unreasonable Premiums and Misrepresentation concerning Products and Services (Consumer Affairs Agency, 2013), but such a countermeasure is difficult to enforce for advertisement in this gray area. In this way, as the "corrupted persuasion tactics" are prevalent in the market, consumers must constantly think about whether advertisements they usually see use deception.

1.1 Factors determining perceived deceptiveness

Firstly, what do people consider to be deceptive? To answer this question, the information manipulation theory by McCornack (1992) is a good reference. McCornack (1992) pointed out that people perceive a message as deceptive when the message breaks the cooperative principle in conversation that is advocated by Grice (1975). The cooperative principle of conversation are defined as the principle that participants in the conversation are expected to obey, and is classified into four maxims: the maxim of quantity, quality, relation, and manner. The information manipulation theory assumes that when the speaker breaks these maxims by manipulating information he owns, the listener perceives the message as deceptive. In past empirical studies, it is demonstrated that messages breaking the maxims are judged to be deceptive. (e.g., McCornack, Levine, Solowczuk, Torres & Campbell, 1992; Morisaki & Kito, 2011; Murai, 2005).

Although perceived deceptiveness was mainly examined in conversational contexts, this discussion is also considered applicable in cases where advertisements deliver messages to consumers. In reality, the inference of manipulative intent has been studied over a long period in the field of consumer behavior as a similar concept to perceived deceptiveness. The inference of manipulative intent is defined as "consumer inferences that the advertiser is attempting to persuade by inappropriate, unfair, or manipulative means" (Campbell, 1995, p. 228).

The inference of manipulative intent is not necessarily the same as perceived deceptiveness, but what it means is that they are similar to one another (Boush et al., 2009). For example,

Kirmani & Zhu (2007) manipulated regulatory focus (Higgins, 1997) and presented advertisements with either a high, medium, or low manipulative intent to participants in order to measure brand attitude, perceived quality of the product, and the perceived deceptiveness of an advertisement. As a result, it was discovered that the interaction effect of regulatory focus and manipulative intent on brand attitude and perceived quality was proved to be completely mediated by perceived deceptiveness of the advertisement. Although this study incorporates a new factor of regulatory focus, Kirmani & Zhu (2007)'s findings indicates that the degree of manipulative intent determines attitude to advertisements thought the mediation of perceived deceptiveness.

1.2 Measurement problems

Taking into consideration that the inference of manipulative intent inhibits attitude change toward advertisements (e.g., Campbell, 1995; Cotte, Coulter, & Moore, 2005; Wentzel, Tomczak, & Herrmann, 2010), manipulative intent and its mediator, perceived deceptiveness, can be considered an important factor to examine. On the other hand, some researchers question the methods for measuring perceived deceptiveness themselves. Murai (2005) mentioned the problem of asking about perceived deceptiveness by using questionnaires and discussed this issue in detail. He suggested that explicitly rating perceived deceptiveness by questionnaires itself can generate perceived deceptiveness even for participants who are not suspicious before rating it. To be more precise, being asked to rate the degree to perceived deceptiveness can induce perceived deceptiveness. As a method of measuring perceived deceptiveness, questionnaires can be inappropriate.

What can be done to solve this issue? One possible solution is to use implicit measures. A representative example of implicit measures is the Implicit Association Test (IAT) by Greenwald, McGhee, & Schwartz (1998). The IAT indirectly measures the strength in an association between 2 concepts (Nosek, Greenwald, & Banaji, 2007); using implicit measures such as this is thought to allow for measurement of perceived deceptiveness. However, the IAT has the disadvantage that it can measure only a certain pair of concepts. It is possible to apply IAT for a concept which holds an opposing concept, such as "European American—African American" or "positive—negative," and thinking of rating perceived deceptiveness of an advertisement, we cannot use the IAT because we have no contrary concepts to the advertisement. Thus, in this research, we used the Go/No-go Association Task (GNAT) created by Nosek & Banaji (2001). The GNAT is an improved version of the IAT, which always requires said contrary concepts, and the GNAT does not need contrary concepts. The GNAT measures strength of association through pushing or not pushing a button, and calculate *d'* based on signal detection theory. By using the GNAT, we can measure the implicit perceived deceptiveness towards a specific advertisement which does not have contrary concepts.

From this perspective, this research aimed to measure perceived deceptiveness using the GNAT and test its validity, because measuring perceived deceptiveness with explicit measures have the

problem mentioned above. Specifically, we presented an advertisement to participants and measured their implicit perceived deceptiveness, explicit perceived deceptiveness, brand attitude, and perceived quality of the product. We predicted that implicit perceived deceptiveness would positively correlate with explicit perceived deceptiveness, and that would have negative impacts on brand attitude as well as perceived quality of the product.

2. Methods

2.1 Preliminary survey

To extract the words used in the GNAT as stimulus words, we asked 14 male and female college students (male: 10, female: 4) of ages 20 to 24 (average: 21.71 years old, SD = 1.14) to evaluate words related to trust. Target words were 24 in total: 12 words which were expected to invoke feelings of trust in participants, and another 12 expected to be deemed untrustworthy. Participants were asked to answer the question, "How 'trustworthy' do you feel the following words are?" on a 7-point scale between "1.Not at all trustworthy" to "7.Definitely trustworthy"

The mean and the SD were shown in Table 1. The top six words of "family," "evidence," "accuracy," "best friend," "comrade," and "truth" were used as stimulus words for the "trustworthy" category in a later experiment. On the contrary, the bottom six words "fraud," "fallacy," "fabrication," "concealing," "injustice," and "fake," were used as stimulus words in the "untrustworthy" category[1)].

TABLE 1. Means and standard deviations of the words related to trust

Trustworthy		Untrustworthy	
Word	Mean (SD)	Word	Mean (SD)
Best friend	5.50 (1.16)	Distorting	2.29 (1.44)
Genuine	4.14 (1.17)	**Fallacy**	1.71 (1.07)
Comrade	5.36 (.74)	**Concealing**	1.93 (.83)
Fact	5.21 (1.42)	Lie	2.43 (1.45)
Evidence	5.86 (.77)	Criminal record	2.14 (.86)
Real	5.00 (1.04)	**Injustice**	2.00 (1.18)
Accuracy	5.71 (.73)	Imitation	3.14 (.86)
Pure	5.14 (1.29)	**Fraud**	1.50 (.76)
Bond	4.71 (.91)	**Fabrication**	1.79 (.58)
Warranty	4.79 (.80)	**Fake**	2.07 (1.14)
Family	6.36 (.93)	Illegal	2.00 (.68)
Truth	5.21 (1.25)	Disguise	1.64 (.93)

Notes: Bolded words are used in the GNAT task. The experiment was conducted all in Japanese.

[1)] The word "disguise," which earned the second lowest evaluation, was supposed to be chosen for a stimulus word in the "untrustworthy" category, but we mistakenly chose the word "fake." However, since "fake" also earned a low-enough score, we do not believe that this mistake has an impact on the result and the implication of this article.

2.2 Participants

Participants were 28 male and female college students (male: 15, female: 13) who were 20 to 30 years old ($M = 21.79$, $SD = 2.11$).

2.3 Procedure

After the participants entered the experimental room, they were explained that this was an experiment for the evaluation of a new drink. After the participants entered their age and gender, regulatory focuses were manipulated[2)].

After the manipulation, an advertisement of a drink brand, Ceres, was presented for 60 seconds on the screen, and the GNAT tasks began when the advertisement disappeared. Following the GNAT tasks, participants answered questions regarding the advertisement. Finally, we debriefed on the purpose of the experiment to the participants. The experiment was conducted on a computer using Inquisit 4.0 (Inquisit4, 2015).

2.3.1 Advertisement

Taking references from Kirmani & Zhu (2007), the advertisement that was shown was created with the intent to indicate a medium level of manipulative intent (Appendix 1). In Kirmani & Zhu's experiment, the manipulative intent of the advertisement was manipulated through the reliability of the source of the sentences in the advertisement's second paragraph. Similarly, we added an imaginary evaluation of Ceres by the Consumer Report in the second paragraph of the advertisement. The advertisement consisted of an image, a explanation consisting of three paragraphs, and a title.

2.3.2 The GNAT task

The GNAT consisted of 4 practice blocks and 2 GNAT blocks. There were 4 types of stimulus categories: "trust," "distrust," "Ceres," and "Not Ceres." In the "trust" and "distrust" categories, 6 "trustworthy words" and 6 "untrustworthy words" that were extracted respectively from the preliminary survey were used as stimulus words. In the categories of "Ceres" and "Not Ceres," 6 images associated with Ceres (e.g., images of the drink's packaging, a factory with a logo) and 6 images not associated with Ceres (e.g., other brand drinks, other companies' factories) were used as stimulus images respectively.

Practice blocks: Practice blocks were provided for participants to remember which stimulus

2) Originally, this research was going to manipulate regulatory focus and investigate its effects, but because significant differences were not seen between the conditions of the regulatory focus's manipulation check items (promotion focus average: 3.57 ± 1.79, prevention focus average: 4.29 ± 1.64, $t(25.808) = -1.10$, $p = .280$) and the manipulation of regulatory focus was deemed to be a failure. Therefore analysis was made disregarding these conditions. Manipulation of regulatory focus was conducted through priming of ideals (promotion) or oughts (prevention), which is used in many past studies (e.g., Kirmani & Zhu, 2007). In the promotion-focus condition, participants were asked to think about their past hopes or dreams and to list two of them. In addition, they were also asked to think about their current hopes or dreams and to list two of them. In the prevention-focus condition, participants were asked to think about their past duties or responsibilities and list two of them. After that, they were also asked to think about their current duties or responsibilities and list two.

words (images) fall into which categories. Participants were asked to judge if a stimulus word (image) displayed in the middle of the screen belongs to any of the stimulus categories ("trustworthy," "untrustworthy," "Ceres," and "Not Ceres") displayed on the upper part of the screen. Participants pressed the space key if they thought that the stimulus belonged to the categories, or did not press the space key if they thought otherwise. After the judgment using the space key was made, feedback regarding the correctness of the judgment was given. This process was done once for each stimulus category, which meant 4 blocks in total. The number of trials per block was 16, and the time span for displaying a stimulus word (image) was 1000ms. The stimulus category that came up first was completely random. When the "trustworthy" or "untrustworthy" category was displayed as a stimulus category, one of 12 words from the 6 "trustworthy" and 6 "untrustworthy" words was displayed in the middle of the screen. When "Ceres" or "Not Ceres" was on the screen as a stimulus category, one of 12 images in total from 6 images associated and 6 images not associated with Ceres was displayed in the middle of the screen.

GNAT blocks: The GNAT was conducted after the participants sufficiently learned how to sort stimulus words (images) into stimulus categories through the practice blocks. Though only 1 kind of stimulus category was displayed during the practice blocks, in GNAT blocks, 2 categories were displayed on the upper part of the screen. Participants were asked to make a judgment on whether or not a stimulus word (image) displayed in the middle of the screen belonged to either of the categories on the upper part of the screen (Figure 1). This task consisted of 2 blocks. One was a combination of "trustworthy" and "Ceres," and the other was of "untrustworthy" and "Ceres." After this, the former is referred to as the "Trustworthy-Ceres" block and the latter as the "Untrustworthy-Ceres" block. The number of attempts in each block was 76, and the time span for displaying a stimulus word (image) was 600ms. Additionally, the order of the blocks was counterbalanced among participants.

2.3.3 Measures

After the completion of the GNAT tasks, participants were asked about their attitudes towards the advertisement using the items below. Unless otherwise stated, a 7-point scale from "1. Completely disagree" to "7. Strongly agree" was used.

FIGURE 1. An example of the GNAT

Brand attitude: 3 items were asked. "I hate the brand in this advertisement (reverse scored)," "The brand in this advertisement is attractive," and "I have a positive impression regarding the brand in this advertisement."

Perceived quality of the product: 4 items were asked. "I think this product is high-quality," "I think this product tastes good," "The product design is sophisticated," and "I feel anxious about drinking this product (reverse scored)."

Brand interest: 3 items were asked. "I have an interest in this brand," "I am not interested in this brand (reverse scored)," and "I am attracted to this brand."

Free writing on the advertisement: The participants were asked, "What impression did you get from this advertisement? Please write down whatever came to mind," and were given an opportunity to freely comment on their impressions of the advertisement. This item was used to measure explicit perceived deceptiveness without directly asking. Details are discussed later.

General trust scale: To examine the participants' general trust towards others, they were asked to answer general trust scale (Yamagishi, 1998). This scale consists of 6 items on a 5-point scale, from "1. Strongly Disagree" to "5. Strongly Agree"

Knowledge about Ceres: Participants were asked if they had known about Ceres, the product presented in the advertisement, even before the experiment. They answered by using two options of "Yes" or "No."

Experience of Ceres: Participants were asked if they had ever drunk Ceres in the past, and answered by using two options of "Yes" or "No".

Manipulation check for regulatory focus: Participants were asked, in order to check if they succeeded in the manipulation regulatory focus, to answer the one item of: Remember the time before you saw this advertisement. Do you think you had been skeptical then? This item was referenced from Kirmani & Zhu (2007).

3. Results

3.1 Data

Since there were no participants who had known Ceres or had drunk it, all data were used for the following analysis.

3.2 Calculation of implicit perceived deceptiveness scores

Concerning data processing, we followed the method by Nosek & Banaji (2001). Only "Trustworthy-Ceres" block and "Untrustworthy-Ceres" block were used for analysis. Firstly, after eliminating the first 16 trials out of 76 trials, the responses of the participants were categorized as "hit," "miss," "false alarm," or "collect rejection" based on the signal detection theory. Then we transformed the hit rate and the false alarm rate of each block to probit, which is defined as *d'*, indicating the strength of association. Finally, the "Trustworthy-Ceres" block's

d' is subtracted from the "Untrustworthy-Ceres" block's *d'*, and we used it as the implicit perceived deceptiveness score. The higher implicit perceived deceptiveness score means that the participant perceives more deceptiveness toward the advertisement. In cases where the hit rate or false alarm rate was 1 or 0, calibration was conducted based on Macmillan & Creelman (2004)[3].

3.3 Calculation of explicit perceived deceptiveness scores

In order to measure the explicit perceived deceptiveness towards an advertisement without directly asking the participants, we rated the free writing answers. The raters were the experimenter, a graduate school student, and an undergraduate student. Those 3 individuals read free writing answers individually and estimated the participants' feelings of untrustworthiness towards the advertisement using a 7-point scale, from "1. The participant did not have any feeling of untrustworthiness at all" to "7. The participant had strong feelings of untrustworthiness." The concordance rate between the raters was sufficient (α = .89), and we used this score as the explicit perceived deceptiveness score toward the advertisement.

3.4 Reliability of items

In order to check the reliability of items such as brand attitude (α = .81), perceived quality of the product (α = .76), brand interest (α = .87), and general trust scale (α = .67), the Cronbach's α was calculated. Concerning perceived quality of the product, since deleting "The product design is sophisticated," resulted in α = .78, this item was deleted, and analysis was conducted using the remaining 3 items.

3.5 Validity of implicit perceived deceptiveness

The average of the measured dependent variable and the standard deviation were shown in Table 2, and the correlation coefficients between the dependent variables were shown in Table 3. As results of the correlation analysis, a significant correlation between the implicit perceived deceptiveness and the explicit perceived deceptiveness was not found ($r = -.27$, $p = .170$).

Next, hierarchical multiple regression analyses toward brand attitude and perceived quality of the product were conducted in order to examine whether or not these items

TABLE 2. Means and standard deviations of the measured variables

Variables	Mean (SD)
Brand Attitude	5.11 (.96)
Perceived Quality of the Product	5.15 (.95)
Brand Interest	4.33 (1.26)
Geteral Trust	3.55 (.49)
Implicit Perceived Deceptiveness	−.19 (.60)
Explicit Perceived Deceptiveness	3.89 (1.69)

[3] In cases where the hit rate or the false alarm rate was 0 or 1, they were calibrated as $1/(2N)$ or $1-1/(2N)$ respectively. Here, "*N*" indicates the total number of hits and misses when we calibrate hit rate. When we calibrate false alarm rate, "*N*" indicates the total number of false alarms and collect rejections.

TABLE 3. Correlation coefficients between the measured variables

	Brand Attitude	Perceived Quality of the Product	Brand Interest	General Trust	Explicit Perceived Deceptiveness
Perceived Quality of the Product	.84 ***	—	—	—	—
Brand Interest	.55 **	.48 **	—	—	—
General Trust	.27	.13	.20	—	—
Explicit Perceived Deceptiveness	−.58 **	−.51 **	−.35 †	−.22	—
Implicit Perceived Deceptiveness	−.14	−.22	−.21	.26	−.27

Notes: † $p < .10$, * $p < .05$, ** $p < .01$, *** $p < .001$

TABLE 4. Results of hierarchical multiple regressions toward brand attitude and perceived quality of the product

Independent Variables	Brand Attitude			Perceived Quality of the Product		
	Step1	Step2	Step3	Step1	Step2	Step3
Brand Interest	.52 **	.39 *	.29 †	.48 *	.35 †	.22
General Trust	.16	.10	.17	.04	−.02	.07
Explicit Perceived Deceptiveness		−.42 *	−.51 **		−.39 *	−.50 **
Implicit Perceived Deceptiveness			−.26			−.33 †
Adj.R^2	.28 **	.42 **	.46 **	.17 *	.29 *	.35 **
ΔR^2		.14 *	.03		.11 *	.06 †

Notes: † $p < .10$, * $p < .05$, ** $p < .01$, *** $p < .001$

could be explained by implicit or explicit perceived deceptiveness. Step 1 for this analysis was to input control variables such as brand interest and general trust. Step 2 was to input explicit perceived deceptiveness score, and Step 3 was to input implicit perceived deceptiveness score. The results were as shown in Table 4.

As a result of the hierarchical multiple regression analysis toward brand attitude, the coefficient of determination in Step 2 showed a significant increase ($\Delta R^2 = .14$, $F(1.24) = 7.63$, $p = .011$); however, this was not seen in Step 3 ($R^2 = .03$, $F(1.23) = 1.29$, $p = .125$). In the Step 3 model, a significant coefficient of determination (Adj.$R^2 = .46$, $F(4.23) = 6.66$, $p = .001$) was obtained. Furthermore, the influence of explicit perceived deceptiveness was significant ($\beta = -.51$, $t(23) = -3.14$, $p = .005$), and the influence of brand interest was marginally significant ($\beta = .29$, $t(23) = 1.73$, $p = .098$). Meanwhile, the influences of implicit perceived deceptiveness ($\beta = -.26$, $t(23) = -1.59$, $p = .125$) and general trust ($\beta = .17$, $t(23) = 1.09$, $p = .287$) were not significant.

As a result of the hierarchical multiple regression analysis toward perceived quality of the product, the coefficient of determination in Step 2 showed a significant increase ($\Delta R^2 = .11$, $F(1.24) = 3.18$, $p = .029$), and the increment of the coefficient of determination in Step 3 was marginally significant (ΔR^2 .06, $F(1.23) = 1.99$, $p = .078$). In the Step 3 model, a significant

coefficient of determination (Adj. R^2 = .35, $F(4.23) = 4.67$, $p = .007$) was obtained, and perceived quality of the product, was explained by explicit perceived deceptiveness ($\beta = -.50$, $t(23) = -2.82$, $p = .0096$) as well as implicit perceived deceptiveness ($\beta = -.33$, $t(23) = -1.84$, $p = .078$). On the other hand, perceived quality of the product was not explained by brand interest ($\beta = .22$, $t(23) = 1.24$, $p = .227$) or general trust ($\beta = .07$, $t(23) = .40$, $p = .694$).

4. Discussion

This research was conducted to resolve the issue that Murai (2005) mentioned, that is, asking about perceived deceptiveness using questionnaires could potentially generate perceived deceptiveness. Therefore we measured implicit perceived deceptiveness using the GNAT and tested its validity. As a result, a correlation between implicit perceived deceptiveness and explicit perceived deceptiveness was not significant. Moreover, implicit perceived deceptiveness did not have a significant influence on brand attitude. On the other hand, there was a marginally significant effect of implicit perceived deceptiveness toward perceived quality of the product. This indicated that the hypothesis was partially supported.

The reason for the lack of correlation between implicit and explicit perceived deceptiveness can be that implicit perceived deceptiveness is partially different from explicit perceived deceptiveness. Fujii (2010), who reviewed past IAT researches, concluded that implicit self-concepts measured by IAT and explicit self-concepts measured by questionnaires are different in quality. Also, in this research, it is likely that qualitatively different concepts were measured respectively by using the GNAT and by the questionnaire.

The result of multiple regression analysis toward perceived quality of the product also supports this assumption. Though there was no correlation between perceived quality of the product and implicit perceived deceptiveness, implicit perceived deceptiveness had an impact on perceived quality of the product when explicit perceived deceptiveness was controlled. In other words, implicit perceived deceptiveness by itself does not predict perceived quality of the product, but it predicted by controlling explicit perceived deceptiveness. The aspects that explicit perceived deceptiveness could not measure are thought to be measured by implicit perceived deceptiveness.

On the other hand, implicit perceived deceptiveness did not predict brand attitude. This implies that the impression from the advertisement did not apply to the brand on an implicit level. Although advertisements can popularize brand names, its primary goal is still to advertise goods. Compared to perceived quality of the product, it is believed that only an influence on the explicit level was observed since an inference at more abstract level is needed to evaluate branding in an advertisement.

However, it cannot be denied that there is a problem with respect to methods of measurement in this study. In other words, it is slightly doubtful that we have achieved measurement of implicit perceived deceptiveness using GNAT without eliciting any perceived deceptiveness.

Although attempts to prevent evoking perceived deceptiveness by using implicit measures were made, showing words such as "trustworthy" or "untrustworthy" on screens during the GNAT tasks was inevitable. It is possible that displayed words activated thoughts connected to deceptiveness, which influenced the subsequent attitude evaluations. Furthermore, since the IAT and the GNAT are popular techniques for measuring attitudes that have been built up over a long period like stereotypes, their validity comes into question when we measure temporary attitudes such as impressions towards an advertisement by using implicit measures.

Despite the issues discussed above, this research showed that it is possible to measure perceived deceptiveness by using implicit measures. Taking the impact of implicit perceived deceptiveness on perceived quality of the product into consideration, it is certain that measuring perceived deceptiveness by implicit measure has validity to some extent. Furthermore, considering real-life applications, implicitly measuring in which consumers are not conscious of being evaluated may result in a more accurate prediction of buying behavior than surveys which use questionnaires that easily induce response bias. In future researches, there is a need to improve the GNAT tasks and to apply them in the field of consumer behaviors.

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