

協會之間的重複性信息效果和社會營銷溝通的有效性台灣的實證研究
AN EMPIRICAL INVESTIGATION OF THE ASSOCIATION
BETWEEN REPETITIVE MESSAGE EFFECT AND SOCIAL
MARKETING COMMUNICATION EFFECTIVENESS IN TAIWAN

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摘要

本研究注重的重複消息的計劃行為理論的影響。進行了實驗，其中通信效應檢驗了一個消息重複三級信息曝光。所獲得的數據證明了這一點概念性的觀點的結果在研究的社會化營銷的回收利用問題信息的有效性重複溝通。

ABSTRACT

This study pays attention to the effects of repetition message on Planned Behavior Theory. An experiment was conducted in which communication effect was examined for a message repetition at three levels of message exposure. The obtained data demonstrated the results of this conceptual perspective in examining repetitive communicating of message effectiveness in recycling issue of social marketing.

Keywords: *Communication effectiveness, Planned Behavior Theory, repetitive message effect, recycling behavior, social marketing communication*

I. INTRODUCTION

The development of human beings affects quite much the nature. Since industrialize and modernize of our world, the environment bares hardly many effects, such as natural resources scarcity, pollution, global warm... and in vice versa it causes human beings world troublesome. Human beings have to change their mind and have right actions. Therefore, behavioral programs for environmental protection are needed. Intellectual classes all around the world make many efforts to study the relationship between environmental concern and human behaviors that contribute to environmental problems and design programs for building awareness needed to effectively modify human behaviors toward the environment. Earlier scholar papers approached theories of environmentalism, built conceptual frameworks for the theories of behaviors toward environment, and developed the frameworks and continually looking for solutions to promote pro-environmental behavior. Recycling behavior is one of pro-environmental behaviors [9, 29, 70, 78, 135, 156, 158, 164, 166.]. The scholars have been extensively researched about

recycling behavior for several decades [84, 162]. Recent 50 years (after 1968 up to now), the researchers have being attempted to study about what factors can affect recycling behavior effectively. More recently it has become clear that there are several distinct types of recycling behaviors as their classifications, for instant, recycling behavior in the public and private spheres [158], household recycling behavior, medical waste recycling behavior, industrial waste recycling behavior... Those different combinations of causal factors determine the different types of frameworks. There are some powerful theories of behavior that are applied to measure recycling behaviors such as theory of reasoned action [60], theory of altruistic behavior [149], theory of planned behavior [4], model of change [139], ABC theory [77], "dual-process" models [153].

In particular, household recycling behavior is much focused. In the recycling literature of research on factors influencing sorting household waste behavior for recycling, researchers have applied many models and added more factors to develop the models [30, 33, 38, 44, 67, 78, 134]. However,

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recycling behavior in the public sphere is not mentioned much in the social movement literature. Public behavior researchers, political scientists and public policy makers just sometimes examine such behavior [1, 38, 158, 180]. Therefore, this paper aims recycling behavior in the public places as a target behavior. This environmental issue relates much about environmental citizenship since the public places involve the areas that are used in common by all people in that community such as universities, companies, offices, MRT station, bus station, train station, museums, amusement parks, parks, ect. This type of behavior was mentioned in some previous studies to distinguish from the other behaviors [53, 159]. It was called public-sphere behaviors in Stern's paperwork in 2000. Although these behaviors affect the environment only indirectly, the effects may be large as the recycling behaviors of many people and organizations in a society could be changed. A point of public-sphere recycling behaviors that is worth paying attention for is that environmental concerns are within awareness, attitude, social pressure, voluntarily behavior... and may therefore be influential. However, the private-sphere recycling behavior is just similar to the public-sphere recycling behavior because many people independently do the same things since they have direct and the same environmental influence [158]. Thence, this paper is not trying to classify recycling behaviors but testing a framework to find an appropriate way to stimulate waste sorting behavior toward recycling of humans. The waste here are usually paper, plastic, aluminum, can, glass, carton, food and those are products that people use in their daily life. Behavior of sorting waste for recycling is personal habit due to people usually classifies their own waste routinely [47, 158].

In the recycling reviews, three dependent variables were found early, namely attitudes toward recycling, behavioral intentions, and actual recycling behavior [84]. Besides, the behaviors and their causes were classified [158]. [47] proved that four causal variables affect environmental behavior, those are attitudinal factors (norms, beliefs, values...), contextual forces (persuasion, modeling, regulations, contract, design, technology, curbside recycling programs, pressure, price...), personal capabilities (skills, knowledge, time, literacy, money, social status, power...), and habit or routine. Thereafter, they, in the same paper, suggested that a new context may lead someone to consider his or her attitudes and values in developing new habits [47]. However, the studies that just focused on contextual variables or theoretical frameworks may find effects and power but failed to understand their attitudes, beliefs, and behaviors [47]. Thereupon, more and more scholars

have being researched in this field to propose suitable models, for instant, theory of reasoned action [60], theory of altruistic behavior [149], model of change [139], ABC theory [77], theory of planned behavior [4], "dual-process" models [153]. These models also take into account personal capabilities, context, and habits; they are more suitable for explaining behaviors that have significant environmental impacts. Planned Behavior theory is more outstanding in literature reviews of many scholar papers. Besides, this paper needs a model and empirical results to know more daily waste sorting behavior for recycling. Therefore, a purpose of this study is understanding people recycling intentions by conducting data analysis with two steps. First, the Planned Behavior Theory that is proposed by [4] is employed as a basis theory to evaluate people behavioral intentions toward recycle waste. Second, efforts will be made to use repetitive message technique as a potential moderator and to test whether repetitive message plays out its moderating role. In the other words, this paper is attempting to examine the modes of repetitive message effect the individuals' behavior. Then, a research framework is drawn out. It is hoped that there will be a better understanding of the recycling intentions of Taiwan's students and that this study may come up with well-founded suggestions for the policy makers. In the next section – literature reviews, Planned Behavior Theory, social marketing communication, and repetitive message effect are reported.

II. LITERATURE REVIEWS

2.1 Planned Behavior Theory (PBT)

The Planned Behavior Theory [4] is applied by many researchers to study about human beings behaviors recent years [10, 17, 57, 59, 72, 85, 108, 136, 152]. The theory earlier is used in commercial marketing to understand consumers' attitudes toward recycling and their perceptions of the barriers to recycling [96, 170]. On the other hand, the Planned Behavior Theory could also be used to explain recycling behavior as many researchers that were successful in applying the theory in social marketing, such as behavior in understanding wastepaper recycling, recycling behavior, predict recycling involvement and application of Theory of Planned Behavior to understanding progress through stages of change [4, 28, 40, 59, 81, 132-133, 155, 170]. The PBT is one of the most widely-applied theoretical frameworks in social marketing [175].

The PBT discussed about how a specific behavior is formed from a formation of intentions, and so this behavior is partly under the control of the individual. According to the theory, a behavior is predicted by attitudinal factors, normative factors, and perceived behavioral control [4, 6-8]. In detail, behavioral beliefs produce a favorable or unfavorable attitude toward the behavior; normative beliefs result in perceived social pressure or subjective norm; and control beliefs give rise to perceived behavioral control. In combination, attitude toward the behavior, subjective norm, and perception of behavioral control lead to the formation of a behavioral intention [4, 6-8]. However, behavioral intention is found difficult to lead to actual behavior, hence, perceived behavioral control can be as a proxy directly causes actual behavior [4].

2.2 Social marketing communication

Marketing is always mentioned as a tool for commercial. The researchers earlier studied about consumers' environmental behavior [31], or "green" consumer who is friendly to environment and concerns about environmental issues [24, 156-157]. Then, they tried to inform consumer about recycling benefits and how to recycle [20, 43, 50, 61-62, 105, 110, 131, 169]. They just simply focused on commercial purposes. Even in recycled content; it is also written in marketing literature as consumer roles in the households or related to consumption by members of the households [38, 52, 55] or consumers' recycling behavior [84, 118, 128, 134, 150, 158]. After that, more and more scholars attempt to use marketing tool to mediate and link people to recycling issues. The target groups are not just only consumers but also people who are different ages, different careers, different education levels... in society. Thence, they started to dig in social marketing. The idea of social marketing was first introduced in [98]'s article. Then, it was formally discussed in a few years later [99-100]. After several decades, social marketing is defined clearer (see [13, 22, 64, 97]).

Social marketing has been defined as "the design, implementation, and control of programs calculated to influence the acceptability of social ideas and involving considerations of product planning, pricing, communication, distribution and marketing research" (p.5) [100]. It has been also described as "a process that applies marketing principles and techniques to create, communicate, and deliver value in order to influence target audience behaviors that benefit society (public health, safety, the environment, and communities) as well as

the target audience" [13-14, 97, 102-103, 143], and in [39]. In addition, in their own texts, [97] stressed: "social marketing is about influencing behaviors"; "similar to commercial sector marketers who sell goods and services, social marketers are selling behaviors" (p. 8). In short, communication is involved in social marketing process as one of tools to influence behaviors. Besides, social behavior is an object in social marketing [84].

At the early stage, the term "community-based social marketing" was coined. Community-based social marketing is a process which relies much on media advertising for developing and delivering environmental programs that is based on psychological knowledge [118]. This process can be effective in creating public awareness and improved understanding of issues [18, 45, 179]. Community-based social marketing process includes four steps: dismantle barriers to behaviors and selecting which behavior to promote based upon this information; designing a program to overcome the barriers to the selected behavior; piloting the program; and then evaluating it once it is broadly implemented [120]. The process merges knowledge and psychology from social marketing which emphasizes that effective program design begins with understanding the barriers people perceive to engaging in an activity [13-14, 69, 97, 102]. An effective social marketing strategy removes barriers to the behavior to be promoted [118]. For instance, the idea of using repetitive messages for promoting recycling behavior change are to repeatedly remind people to do recycle. Community-based social marketing has been proved to be the design of programs to foster sustainable behavior [119, 120]. Sustainable behavior is behavior change toward a sustainability environment [68, 71, 89, 122, 148, 167]. Furthermore, in social marketing perspective, recycling behavior is the product, and the problems to be addressed are how to get consumers to adopt it [13, 151] and how the consumers themselves become the suppliers of raw material produced [65]. In addition, in marketing perspective reviews, social marketing is always defined as a process or a systematic application of marketing principles and techniques [102, 109], commercial marketing concepts and tools, or commercial marketing principles and tools, or marketing principles [102].

Social marketing has become an increasingly important aspect of marketing in recent years. Social marketing was used to describe the application of marketing theory to solving social issues such as recycling, health, behavior, smoking, safety driving, and so on [28, 32, 35, 41, 80, 90, 102, 155, 160]. Since the prior purpose of social marketing

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communications is to change people's behavior [12-13, 28, 41, 49, 80, 90, 93], social marketing communications usually focus on making it easier to change people's behavior, the people who are a part of the social group [63, 66, 102, 109]. In the other words, social marketing purposely influences target audience behaviors, study to understand behavior and modify it to achieve a specific behavior, [102, 109, 119]. On the other hand, parallel with target audiences' behavior, social marketing not only benefits target society, social good, public good, and individuals as well as people's well-being and social welfare but also helps to overcome a societal problem, to improve the quality of life for individuals and society [102, 109, 119]. Hence, the effectiveness of social marketing communications is able to evaluate by understanding what element of the social marketing framework the communication is addressing and what stage of behavior change process is being targeted [49, 58, 59, 81, 93, 137, 177]. In short, knowing people's opinions, attitudes and the other factors can help social marketers maximize participation or develop programs to change behavior in social marketing. Therefore, social marketing communication for recycling is to change people's behavior toward recycling. So, social marketing communication for recycling is a tool for social influence that link recycling to awareness of other people who recycle [84].

2.3 Repetitive message effect

Based on the first explanation in Berlyne's two-factor theory in the beginning of decade 1970s, the effects of repeated exposures to advertising messages are to cause communication effectiveness and it has been investigated extensively [11, 23, 26, 34, 35, 142, 130]. Repeated exposure is one of the key effects in advertising as it is exposed to consumers more than once in comparison to non-repeated exposure ads [54, 107, 138] since repetition relates to message persuasion and it can increase persuasiveness [42, 124, 113]. Besides, repetition effect is found effective in cluttered advertising environments where tons of ads are exposed and people are bombarded by the ads in their daily life [11, 114]. So, the repetitive ads will recall or remind people toward messages contained in the ads since the effect of target ad repetition is on recognition of the target brand name was examined to get people a feeling of familiarity which would increase agreement [25, 54, 107, 114, 121, 124]. Furthermore, repeated ad exposures are used to strengthen benefit in memory as this phenomenon increases the likelihood that the coherence between the brand name and the advertised product are remembered

[172]. Hence, repetition has the effects on attitudes [163]. Repetition of message would lead audiences' attitudes and behaviors toward the message when the message is more familiar to them so repetition tended to make attitude positive [32, 35, 83, 90, 92, 107]. In addition, advertising repetition not only can cause attitude up to higher level [27, 35, 88] but the repetition of advertisement also changes the consumers' behavior in choosing the products [19, 141]. On the other hand, although repetition message effect is a tool in commercial marketing reviews and it appears regularly in consumer behavior and advertising literatures, academic researchers focused on relationships between marketing and environment as well since 1970s while recycling is one of crucial behaviors that has been explored largely [36, 48, 83, 86, 93, 133, 161, 170]. The fact is found that the association between effective communication and repetitive message effect is a key success factor among many others in changing public attitude and behavior [35, 42, 73, 83, 87, 94, 106, 107, 112, 125].

After many experiments for different levels of repeated message exposure, some researchers argued that the best repeated times in repetitive message effect fall in three repetitions [2-3, 28, 93, 127, 138]. A potentially important parameter for repetition effects was lag – the interval or space between each presentation [73, 82, 87, 107, 171] since the effects of repetition depend on the time of exposure and the length of the time interval between exposures [15, 73, 91, 123]. Regardless of spacing effects, a vast number of studies have demonstrated that the spacing effect refers to the phenomenon that repeated exposures are separated by time or lag or the intervals of time between repetitions [37, 51, 74-76, 113, 116, 144-146]. There is variety of lags in time [115, 117]. However the ideal time between repetitions should be two weeks [168]. In short, spacing and repetition effects are very effective in manipulating memory [140, 168, 174]. Furthermore, spaced repetitions presented in the same context are expected be recalled well rather than spaced repetitions presented in different contexts [91, 104, 126, 140, 147, 176, 171]. In parallel, Planned Behavior Theory is found powerful in measuring people's behavior regarding recycling [16, 36, 40, 48, 95-96, 133, 165, 170]. Therefore, this research paper uses repetitive messages to affect to Planned Behavior Theory's factors to manipulate people's attitude toward recycling, subjective norm toward recycling, perceived behavioral control toward recycling, behavioral intention toward recycling, and actual behavior toward recycling as well as to test if the repetitive messages can also impact to the relationship of the factors within the Planned

Behavior Theory. The above concepts can be ended up as following hypotheses and a research framework.

H1, H2, H3, H4, and H5: Repetitive communicating of a message has a significant positive attitude toward recycling, subjective norm toward recycling, perceived behavioral control

toward recycling, behavioral intention toward recycling, and actual behavior toward recycling.

H6: Repetitive communicating of a message has a significant positive effect on the relationship between attitude, subjective norm, and perceived behavioral control, and behavioral intention toward recycling and actual behavior.

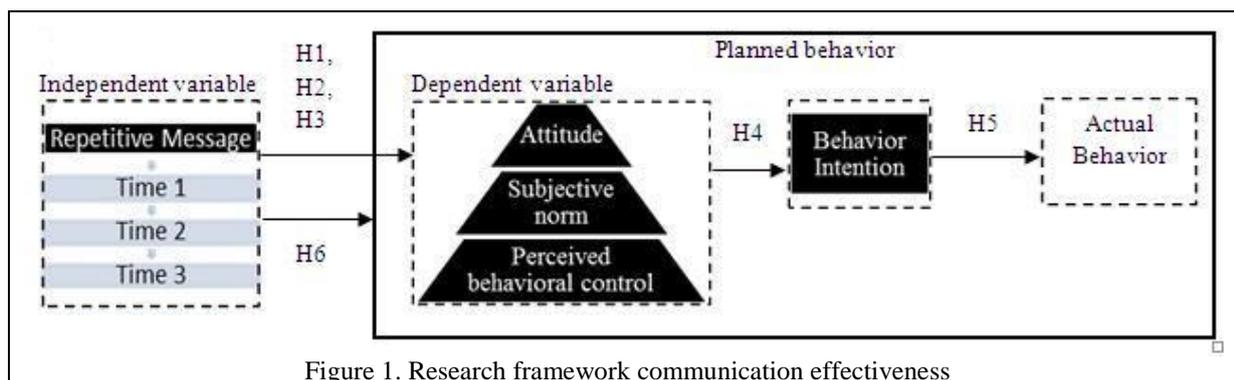


Figure 1. Research framework communication effectiveness

III. METHODOLOGY

It was a community-based analytical study. First part involves the series of questions, which are based on self-report bases participants’ attitude toward recycling, subjective norm toward recycling, perceived behavioral control toward recycling, behavioral intention toward recycling, and actual behavior toward recycling. Second part of questionnaire contains information regarding demographic. Respondents were randomly selected in several different classrooms. They are studying in business administration, finance, and public policies fields. The surveys are conducted at I-Shou University – a private school in Kaohsiung of Taiwan R.O.C. The questionnaires were prepared up to the numbers of students in those classes. The professors of the classes assisted the survey conduction. Besides, all of the responders received souvenirs for their corporations. Finally, 74 respondents were collected so the respondent rate is 100%. The questionnaires

are filled by two age-groups undergraduates who are age group 15-20 and age group 21-25. After the data collection in form of questionnaire, the data were entered using SPSS 19. The one-way ANOVA and MANOVA are mainly used for testing the proposed hypotheses.

The recycling behavior of 74 undergraduates was observed over the period one and a half month in 2011. During the period of observation, all 74 undergraduates were recycling on a regular basis. Besides, they were exposed repetitive messages two times. The same message was showed once every two weeks in their classrooms. The message is showed on the website of Taiwan Environmental Protection Administration in 2010. In recycling context, the message is written related to recycle activity as “Taiwan has not many natural sources, so recycling is very important to Taiwan. Let’s recycle.” In the diagram below, the arrows represent the spacing intervals.



Table 1 - Repetitive message exposure process

The independent variable was repetitive message and the dependent variables were attitude, subjective norm, perceived behavioral control, behavioral intention, and actual behavior of the

planned behavior theory. The communication effect in this study was effectiveness taken from participating recycling activity communication experiment of a university, information students

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about recycling work that they should do. The identical message was repeated three times and exposed to audiences the same way. Particularly, the message was exposed only one time to the participants before they completed the survey form. The experiment was conducted in the class-room and the message was shown for three to five minutes in order to ensure that the message's content was explained clearly and the participants read it carefully. Target audiences took about fifteen minutes to complete a questionnaire after they read the message. The exposure interval for each experiment process was two weeks.

The strong/weak or positive/negative responses were defined such that the responses happened stronger than as usual [130, 132]. For illustration, the respondents have intensity behavior toward recycling much more than the initial one. The study used four variables that were Planned Behavior's dimensions, namely attitude, subjective norm, perceive behavioral control, behavior intention, and actual behavior toward recycling and a five-point Likert-type scale ranging from one (strongly disagree) to five (strongly agree) [49, 59, 178], to measure all items of variables. The study adapted the key items in a research of [41, 155] whose questionnaire was designed, to know the point of view of public people regarding the intended belief and actual behavior in green computing in Hong Kong.

All analyses were made by IBM SPSS Advanced Statistics 19 (Copyright SPSS Inc. 1989, 2010). The level of significance was set to $\alpha = .05$ (95% confidence interval). The t-test is used to test statistical difference of means for two independent normal populations by small sample sizes [159, 174]. This study used one-way ANOVA t-test and the multiple comparison test (multivariate ANOVA or MANOVA for short) appropriate to test hypothesis H6 that compare the means of three groups, i.e. repetitive message effect to planned behavior's variables at three stages of communication. Regression analysis helps understand and explore the relationships between independents and dependent variables. In this study, the relationship between attitude (ATT), subjective norm (SN), perceived behavioral control (PBC), and behavioral intention (BI), and actual behavior (AB) that has been

confirmed by research in many fields is compared between three stages communication about recycling to test hypotheses H1-5.

Data analysis in this research proceeded in two main steps. In the first step, Principal Components Analysis with varimax rotation was applied to the items of the first three groups of questions with the purpose of reducing data [56, 79]. To assess the pertinence of using Principal Components Analysis in this research, the Kaiser-Meyer-Olkin Measure of Sampling Adequacy (KMO) statistic was computed and the Bartlett test was performed [21]. The KMO statistic is a ratio that ranges from 0 to 1 and should be at least 0.7 for Principal Components Analysis to be acceptable. The Bartlett test examines if the correlation matrix among the variables is significantly different from the identity matrix. If the hypothesis that these matrixes are equal is not rejected, Principal Components Analysis should not be applied.

Next, reliability of the model planned behavior should be tested. In this model, attitude toward recycling, subjective norm toward recycling, perceived behavioral control toward recycling, and behavior intention toward recycling are independent variables, and actual behavior is dependent variable.

IV. RESULTS AND DISCUSSION

The sample size is 74. There was a bias in the sample towards 26 male students (35.1%) and 48 female students (64.9%). In addition, the majority of the sample (90.5%) had received 15-20 years old undergraduate students, and 9.5% are from 21-25 years old. Most of the students were freshman and sophomore so the age group 15-20 (90.5%) is much bigger than the age group 21-25 (9.5%) or possibly because the classrooms were randomly chose. However, post hoc test shows that the results are not different between two gender groups and two age groups as well.

The table of rotated component matrix above shows 19 variables within 5 factors, namely attitude toward recycling (ATT), subjective norm (SN), perceived behavioral control (PBC), behavior intention (BI), and actual behavior (AB).

Table 2 - Rotated component matrix and Item-Total Statistics

KMO = .889; Cumulative = 75.321%; Cronbach's alpha = .936 Extraction Method: Principal Component Analysis. Rotation Method: Varimax with Kaiser Normalization.	Components					Corrected Item-Total Correlation
	SN	ATT	PBC	AB	BI	
[Q7] It is expected of me if I recycle.	.795					.615
[Q8] Many people like me recycle.	.741					.636

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[Q10] The people in my life whose opinion I value would approve of me recycle.	.736				.579
[Q9] Most of people who are important to me recycle.	.722				.524
[Q6] Most people who are important to me think that I should recycle.	.703				.622
[Q2] For me, recycling is beneficial.		.872			.649
[Q1] For me, recycling is good.		.826			.603
[Q4] For me, recycling is valuable.		.774			.696
[Q3] For me, recycling is pleasant one.		.539			.673
[Q12] I can improve recycling in the forthcoming weeks			.784		.673
[Q13] I definitely could improve recycling in the forthcoming weeks.			.781		.603
[Q14] It is mostly up to me whether or not I improve recycling in the forthcoming weeks.			.637		.585
[Q5] For me, recycling is enjoyable.			.551		.732
[Q19] I often have recycled.				.867	.599
[Q18] I often recycle.				.850	.635
[Q11] I have totally controlled in recycling				.608	.642
[Q16] I will try to recycle.					.821 .639
[Q15] I will intent to recycle.					.745 .743
[Q17] I will plan to recycle.					.697 .688

KMO is 0.889 greater than 0.5 and smaller than 1 and significant is 0. It means all the factors are suitable, and all the questions in the questionnaires are valid. Five groups of factor (attitude, subjective norm, perceived behavioral control, behavior intention, and actual behavior) all have Eigen value greater than 1. Besides, cumulative is 75.321% greater than 50%. Therefore, all the factors are valid or no factor should be deleted. The reliability of the resulting dimensions (also called principal components) was measured by Cronbach's alpha coefficients [46]. Cronbach's alpha is equal to 0.936 and all corrected item-total correlations are greater than 0.4. Therefore, the questions are reliable and there is no any question should be deleted.

Comparing the results of attitude, subjective norm, perceived behavioral control, behavior intention, and actual behavior of communication at different stages, the multiple comparison test (multivariate ANOVA or MANOVA for short) shows that attitude toward recycling and actual behavior toward recycling have no significant differences between message exposure at time one and time three. On the other hand, however, the subjective norm (p = .013), perceived behavioral control (p = .022), and behavior intention (p = .010) toward recycling do have significant difference and increasing between the first and third communication (Table 3). These results support hypotheses H2, H3, H4 completely but hypotheses H1 and H5 are rejected.

Table 3 - Multiple Comparisons (Multivariate ANOVA)

Dependent Variable	Time to exposure message (I)	Time to exposure message (J)	Mean Difference (I-J)	Sig.
ATT	Time 3	Time 1	.0919	.459
		Time 2	.1324	.287
SN	Time 3	Time 1	.3000*	.013
		Time 2	.2378*	.047
PBC	Time 3	Time 1	.2635*	.022
		Time 2	.1622	.157
BI	Time 3	Time 1	.3242*	.010
		Time 2	.1895	.130
AB	Time 3	Time 1	.0000	1.000
		Time 2	-.0946	.521

*. The mean difference is significant at the .05 level.

One-way ANOVA results show differences among three times exposure (time 1 vs. time 2 vs.

time 3) by mean comparisons (see table 4). [49, 111, 178] showed a way of generating a quantitative value

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(numerical) to a qualitative questionnaire (strongly disagree, disagree, fair, agree, strongly agree). Though subjects' average subjective norm (SN) increases from 3.33 at time 1 to 3.40 at time 2 to 3.63

at time 3; and subjects' average behavioral intention (BI) increases from 3.68 at time 1 to 3.81 at time 2 to 4.0 at time 3.

Table 4 - Repetition model (one-way ANOVA)

Dependent Variable	Time to exposure message	Mean	Std. Deviation	R ²	Adjusted R ²	Sig.
ATT	Time 1	3.9405	.75179	.005	-.004	.550
	Time 2	3.9000	.63699			
	Time 3	4.0324	.85754			
SN	Time 1	3.3378	.77843	.031	.022	.031*
	Time 2	3.4000	.66456			
	Time 3	3.6378	.72805			
PBC	Time 1	3.4459	.67397	.024	.015	.069
	Time 2	3.5473	.62848			
	Time 3	3.7095	.77418			
BI	Time 1	3.6804	.76536	.030	.021	.035*
	Time 2	3.8151	.62227			
	Time 3	4.0046	.86799			
AB	Time 1	3.6824	.93110	.003	-.007	.759
	Time 2	3.7770	.81569			
	Time 3	3.6824	.93110			

*. The mean difference is significant at the .05 level.

The comparison of regression models between three times of communication with attitude (ATT), subjective norm (SN), and perceived behavioral control (PBC) as independent variables, and behavioral intention (BI) toward recycling as dependent variable in model 1, and actual behavior (AB) toward recycling as dependent variable in model 2 results in an increasing of the adjusted coefficient of determination (Table 5) showing the improvement of goodness of fit owing to repetitive communication. Moreover, the regression model for the relationship between attitude, subjective norm, and perceived behavioral control, behavioral intention, and actual behavior that has been demonstrated in various researches is not significant at the first message exposure but is partially

significant and has all positive path coefficients at the third message exposure. The results from Table 2 confirm the hypothesis H6 though not completely. In model 1, at time 1, repetitive message affects to perceived behavioral control then leads to behavioral intention through the path coefficient RE-PBC1-BI1 (p-value = 0.002<0.05). In model 2, at time 1, repetitive message affects to attitude then leads to behavioral intention through the path coefficient RE-ATT2-BI2 (p-value = 0.017<0.05). After that, a good signal comes at time 3, repetitive message affects to attitude as well as perceived behavioral control then leads to significant behavioral intention through the path coefficient RE-ATT3-BI3 (p-value = 0.005<0.05) and RE-PBC3-BI3 (p-value = 0.000<0.05).

Table 5 - Comparison of regression models for repetitive message effect through three times communication (n = 74)

RE	Model	Path	R ²	Adjusted R ²	p-value
Time 1	1	ATT1-BI1	.419	.394	.107
		SN1-BI1			.097
		PBC1-BI1			.002*
Time 2	1	ATT2-BI2	.302	.272	.017*
		SN2-BI2			.751
		PBC2-BI2			.079
Time 3	1	ATT3-BI3	.665	.651	.005*

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RE	Model	Path	R ²	Adjusted R ²	p-value
		SN3-BI3			.149
		PBC3-BI3			.000*
Time 1	2	ATT1-AB1	.379	.343	.818
		SN1-AB1			.953
		PBC1-AB1			.000*
		BI1-AB1			.209
Time 2	2	ATT2-AB2	.394	.359	.480
		SN2-AB2			.730
		PBC2-AB2			.520
		BI2-AB2			.698
Time 3	2	ATT3-AB3	.090	.037	.176
		SN3-AB3			.668
		PBC3-AB3			.663
		BI3-AB3			.703

Model 1: Dependent Variable is ATT, SN, PBC, and BI;
 Model 2: Dependent Variable is ATT, SN, PBC, BI, and AB
 *: p<0.05

In model 2, however, when actual behavior toward recycling (AB) is dependent variable, the results are quite different. Repetitive message affects to perceived behavioral control then leads to actual

behavior through the path coefficient RE1-PBC1-AB1 (p-value = 0.000<0.05) only significant at time 1. Hence, the hypothesis H6 is confirmed partly.

Table 6 - MANOVA and One-way ANOVA results: repetitive message affects PBT's factors

DV	Model	Analysis	Mean Difference (time 3 – time 1)	R ²	Adjusted R ²	F	Sig.
ATT	Repetition Model	One-way ANOVA		.005	-.004	.599	.550
	Multiple Comparisons	Multivariate ANOVA	.0919			.549	.459
SN	Repetition Model	One-way ANOVA		.031	.022	3.528	.031*
	Multiple Comparisons	Multivariate ANOVA	.3000*			6.332	.013*
PBC	Repetition Model	One-way ANOVA		.024	.015	2.708	.069
	Multiple Comparisons	Multivariate ANOVA	.2635*			5.321	.022*
BI	Repetition Model	One-way ANOVA		.030	.021	3.411	.035*
	Multiple Comparisons	Multivariate ANOVA	.3242*			6.757	.010*
AB	Repetition Model	One-way ANOVA		.003	-.007	.276	.759
	Multiple Comparisons	Multivariate ANOVA	.0000			.000	1.000

*. Significant at the .05 level.

In summarization, MANOVA results completely show differences between time 3 and time 1 (see table 6). Significant values prove that subjective norm (SN), perceived behavioral control (PBC), and behavioral intention (BI) increasingly change at the third time of exposure compare to the first time of exposure. Thus, hypotheses H2, H3, H4 are verified. Repetitive communicating of a message has a significant positive subjective norm toward

recycling, perceived behavioral control toward recycling, and behavioral intention toward recycling.

In conclusion, from successful applications of repetitive message effect on commercial marketing, it is reasonable to justify similar positive results in social marketing issues. The incomplete verification of hypotheses could be caused by various reasons. Precise experiment process, interval between and number of message exposure, and effective sample size are all possible critical factors to testify the important inference.

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