

Factors Affecting Consumer Recycling Behavior and the Mandatory Recycling Policy*

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This paper examines various factors that affect recycling behavior, attempting an integrative approach, which encompasses consumer values, prior experience, and environmental knowledge. The study is mainly based on the theory of reasoned action model which suggested social factors in recycling behaviors. The Korean government implemented the mandatory recycling law in 1994. The new law has had a great impact on people's attitude toward recycling and their behaviors, thus this study explores the major developments of consumer perceptions and behaviors within the framework of recycling. Further, performing the recycling behavior is considered as an adoption stage of an innovation, grouped according to the adoption period and compared for the differences in the recycling behaviors.

A survey study was conducted to collect the data with the presently recycling 500 consumers in different sectors of metropolitan areas, medium-sized cities, small cities, and the country-side. A total of 335 questionnaires out of 380 questionnaires that were collected were used for the final analysis. The structural equation analysis was conducted to examine the causal relationship and relative effects among the constructs. The results show as follows. First, the mandatory recycling policy has helped raise consumer awareness of recycling. The data showed that most consumers tried to observe recycling regulations and those who had started recycling voluntarily before the mandatory recycling policy performed more active recycling behaviors. Second, collectivism value was found to affect recycling behavior through subjective norm and attitude as mediating variables. Individuals' values on recycling had a direct influence on recycling attitude and subjective norm, through which they affect behavior. Third, the theory of reasoned action model is a good predictor of consumer recycling behavior. Subjective norm, one of the social behavior, has a greater influence on recycling behavior than individual attitude. Forth, the visibility of recycling behavior has a direct effect on subjective norm which in turn affects recycling behavior. As to the relationship between attitudes toward recycling and actual recycling behavior, previous recycling experience worked as a situational factor, and it was found that incorporating this kind of variable into a behavior model could increase its explanatory power.

Key words: Recycling Behavior, Recycling Policy, Recycling Law, Theory of Reasoned Action, Attitude toward Recycling.

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1. INTRODUCTION

Environmental marketing research started by branching off from the general field of research on consumer behavior. However, recent studies have focused on more specific consumer behaviors related to the environment. Of the specific behaviors, recycling behavior encompassing product disposition and reuse has received a growing interest in the field of environmental marketing. Recycling behavior has been conceptualized as a social dilemma (Wiener and Doescher, 1991).

The reasons for the growing interest are the recycling behavior is closely related to consumers' life styles and it is controllable because environmental problems can be alleviated by the consumption behavior pattern.

In 1994, the Korea government implemented a new mandatory policy on wastes disposition and recycling which had been done in some areas on a voluntary basis. Under the new system, people had to pay for disposing their trash by the volume, while separated recyclable items were collected by the government for free. The new law has had a great impact on people's recycling behavior and their awareness of environmental pollution. Understanding the impact of the mandatory recycling policy would be important to the policy makers

throughout the world. Thus, this study attempts to examine the impact of the policy on consumer recycling behavior.

While most prior research on recycling has been limited to disposition behavior, recent studies have suggested expanding the notion of recycling. For example, Biswas et al. (2000) and Dahab, Gentry and Su (1994) claim the notion of recycling should be expanded to include the entire recycling process behaviors which comprise purchase, consumption, disposition, and the re-consumption of products made from recycled materials. Accordingly, in the present study the definition of recycling behaviors includes participating in sorting out wastes, putting efforts to reduce the amount of wastes, reusing, and reflecting the recycling behavior on purchase.

Unlike prior research on recycling behaviors, most of which was limited to few constructs affecting recycling behavior, recent research examines various factors in relation to recycling behavior (Biswas et al., 2000; Taylor and Todd, 1995). This study includes several related factors that affect recycling behavior, attempting an integrative approach. The study is based on the theory of reasoned action model that suggests social factors in recycling behavior. The purpose of this study is to examine the effects of attitudes toward recycling and subjective norms on behavior which are

influenced by individual values.

The traditional attitude-behavior model has been criticized for its weak explanatory power over attitudes as a predicting variable for behaviors, and situational factors have been considered as for complementary mechanism. The visibility of behaviors based on social factors, and prior recycling experience, are considered in the model. The magnitude of each of their relative effects on recycling behaviors was investigated.

II. CONCEPTUAL BACKGROUND

2.1 Mandatory recycling policy and recycling behavior

Korea has implemented the mandatory recycling policy since 1994. While recycling had been done in some areas on a voluntary basis before the policy, people have had to pay for disposing their trash by the volume under the new system. However, separated recyclable items have been collected by the local government for free as an economic incentive. If people violate the new policy, for example dumping garbage not in a prepaid plastic bag, they are subject to a fine. This new law has had a great impact on people's life styles and their awareness of environmental pollution. Thus, it is

necessary to look into the effect of the mandatory recycling on consumers' behavior and to examine the theoretical dimensions of their recycling behavior.

Vining and Ebreo (1992) report that consumers under a mandatory recycling program had higher subjective norms than those under non-mandatory program. It has been observed that people in Korea show a lot of differences in recycling behavior between before and after the mandatory recycling policy. Under the mandatory policy, people take efforts to separate recyclable items, reduce trash, and refrain from using disposable items. The majority of people showed even higher level of recycling behavior, such as cleaning milk cartons with water, and cleansing empty bottles or aluminum cans. This study attempts to investigate the differences in recycling behavior between before and after the implementation of the policy.

The consumers who recycled voluntarily at certain level before the implementation are likely to show the same level of recycling behavior at a higher dimension and attempt social differentiation by playing the role of a leading group (Arnould, 1989). In the field of research on the diffusion of innovative products, adopters are classified into innovators, early adopters, early majority, later majority, and laggards according to their adopting period (Rogers, 1983). Based

on the assumption that recycling behavior will also have a similar diffusion pattern, diffusion research can be incorporated into recycling research.

Fisher and Price (1992) claim that by the time the majority adopt an innovative product, the innovators show more innovative purchase and use on a higher dimension. Based on their claim, we can hypothesize that by the time the majority is formed, the innovators and early adopters will conduct recycling on a higher dimension, such as purchasing recyclable or recycled products.

- H1: Recycling behavior will be higher after the implementation of mandatory recycling policy than before.
- H2: The group with early recycling experience will show more recycling behavior engaging in not only disposing waste, but also recycling purchase than the group with later or no prior recycling experience.

2.2 Personal value on recycling and individualism/collectivism

Recent recycling studies have employed Ajzen and Fishbein's (1980) theory of reasoned action which considers social factors as constructs that explain recycling behavior in addition to individual attitude (Bagozzi

and Dabholkar, 1994; Dahab, Gentry, and Su, 1994). These studies assumed that consumers are more conscious of social norms in their environmental behavior such as recycling. An individual's subject norms are considered to form, affected by the individual's long-lasting values or the personal value that the individual perceives about a particular recycling behavior. Or the visibility of various recycling behaviors to others may have certain effects. Therefore, an investigation of the relationships among the variables is necessary.

Value is defined as fundamental belief that a particular mode of conduct or end-state of existence is personally or socially more desirable than others (Rokeach, 1973). Homer and Kahle (1988) posit that value affects the degree of socially desirable behavior. Therefore, recycling behavior which belongs to environmental behavior is greatly influenced by the individual's value (McCarty and Shrum, 1993). Stern and Oskamp (1987) claim that attitude, closely related to the individual's value, becomes the bases for his or her behavior. However, these prior studies are lacking in specificity because they investigated the effect of general value orientation, not specific value orientation, such as recycling or environmental value. According to Bagozzi and Dabholkar (1994), each goal or value concerning various recycling behaviors has an influence on

consumers' attitude and subjective norms. By specifying the construct as value on particular recycling behavior, they made a closer approach to casual relationship research between value and attitude, subjective norms, and recycling behavior.

In their study of the relationship between individualism/collectivism and recycling behavior, McCarty and Schrum (1993) found that collectivism-oriented people showed better recycling behavior than the individualism-oriented. Individualism-oriented people are confident in behavioral decision making or controlling its consequence, and they tend to be more faithful to their personal belief than to social evaluation. In contrast, collectivism-oriented people tend to brood over their own decision making and to make endeavors to harmonize the consequence of their behavior and the social norms. It is certain that individualistic/collective value influences consumer recycling behavior. Furthermore, collectivism-oriented consumers who put higher value on observing the social norms will demonstrate higher subjective norms.

Although prior studies have shown the effect of individualistic/collective value and recycling value on consumers' attitude, subjective norms, and behavior, the relative effects of individualistic/collective value on each of consumers' attitude and subjective norms have yet to be studied. In addition,

the nature of relationship between value and recycling behavior also needs to be investigated.

- H3: Personal value on particular recycling will positively affect attitude toward recycling.
- H4: Personal value on particular recycling will positively affect subjective norms.
- H5: The general consumer trait of collective value will positively affect attitude toward recycling while that of individualistic value will negatively affect attitude toward recycling.
- H6: The general consumer trait of collective value will positively affect subjective norms while that of individualistic value will negatively affect subjective norms.

2.3 Perceived visibility of recycling behavior

Belk (1981) states that consumer behavior occurs within a system, and in many cases consumers' purchase and use behaviors are based on social approval. Especially, when the purchase or the use is highly visible, unique, and socially desirable, the consumer behavior itself is largely influenced by social factors. In addition, Miniard and Cohen (1983) developed a behavioral intention model that suggested behavioral intention is greatly influenced by the perceived

visibility of consumption behavior and the surrounding group closely related to the consumer.

Based on their study of innovative product adoption, Fisher and Price (1992) report that the perceived visibility of consumption has a great impact on subjective norms which, in turn, influence purchase behavioral intention. In the field of recycling research, Dahab, Gentry, and Su (1994) claim that perceived visibility of recycling behavior affects subjective norms of recycling behavior, and subjective norms and visibility interactively affect recycling behavior.

Since it is redundant to claim that already formed subjective norms directly influences behavior by interacting again with perceived visibility, Fisher and Price (1992) seem more reasonable in that they claim that perceived visibility of consumption directly affects subjective norms, through which it indirectly influences behavioral intentions. In this study the contradictory aspects between the two studies will be examined with empirical data.

H7: Perceived visibility of recycling behavior will affect subject norms.

2.4 Attitude toward recycling, subjective norms, and prior recycling experience

Attitude toward recycling has been defined

as the sum of multiplication between the perception of the effectiveness of recycling based on one's own recycling behavior and beliefs in each recycling behavior. Most studies have centered on how attitude affects recycling behavioral intention, rather than recycling behavior itself. It has been shown that although attitude affects recycling behavioral intention on the whole, the magnitude is greatly limited.

Recently, Ajzen and Fishbein's (1980) theory of reasoned action has been employed in studying attitude toward recycling and subjective norms as factors affecting recycling behavioral intention (Bagozzi and Dabholkar, 1994; Dahab, Gentry, and Su, 1994).

Subjective norms, one of the factors affecting recycling attitude, is defined as the degree of perception at the time of taking recycling behavior on what kind of recycling behavior his close neighbors or important people expect of him. Vining and Ebreo (1992) report that subjective norms have affect recycling behavioral intention significantly. In addition, they found that consumers under a mandatory recycling program had higher subjective norms than those under a non-mandatory program.

It is hypothesized that examining the magnitude of the relative effects of attitude toward recycling behavior and subjective norms on recycling behavior will reveal consumers' perceptions related to recycling

behavior.

Research has shown that it is not only psychological factors (e.g., personal value and attitude) but also past experience of product use that affect behavior through interacting with consumers' beliefs and attitude (Smith and Swinyard, 1983). In relation to recycling behavior, Bagozzi and Dabholkar (1994) and Biswas et al. (2000) maintain that past recycling behavioral experience affects present recycling behavior as a situational factor.

In recycling behavior, past recycling experience brings down the psychological barrier which can be caused by mere environmental knowledge with no practical experience. Accordingly, a reinforcement effect on behavior is expected from the past experience. In general, recycling behavior is viewed as a difficult chore, and it can elicit negative reaction. However, the actual recycling experience will lower this kind of psychological cost and can shift attitude in a positive direction.

H8: Attitude toward recycling behavior, subjective norms, and prior recycling experience will positively affect recycling behavior.

III. METHOD

3.1 Sample

The data of the present study was collected using questionnaires after 2 years of the implementation of the mandatory recycling policy. The respondents were adult males and females over 20 years old. They were selected through judgmental sampling in a way that they can represent different sectors, such as metropolitan areas, medium-sized cities, small cities, and the countryside. A total of 500 questionnaires were distributed and collected the next day by field research assistants. Of 380 questionnaires that were collected, 25 questionnaires were excluded from the analysis because they contained many items unanswered or the answers were not sincere or complete. A total of 355 questionnaires were used for the final analysis.

3.2 Measure

A questionnaire format was employed and a 5-point Likert scale was used for most question items. Employing the recycling value items developed in the Bagozzi and Dabholkar's (1994) study, the present study asked respondents to mark the importance of each of 20 value items. Examples of

value items included "The reason why I recycle is, recycling: reduces trash; makes material be reused; preserves our environment; saves our earth; is a right thing to do; helps our economy, etc." The individualism/collectivism measures developed by Triandis (1990) were employed in this study. Of the 32 items in the original measure, only 20 items were used, excluding redundant items.

The perceived visibility of recycling behavior was measured by 10 5-point scale questions about how visible one's recycling behavior is to others based on a different pattern of behavior such as disposal, purchase, use and reuse (Fisher and Price, 1992).

The present study divided the concepts of recycling attitude suggested in the prior research into five dimensions before measurements. The five dimensions include attitude toward recycling behavior values, awareness of inconvenience due to time and expense, attitude toward the purchase of a recycled or recyclable product, attitudes toward a recycling program, and awareness of participation need. Each dimension holds 3 to 4 question items, a total of 18 items. Subjective norm is operationally defined as how the respondents' neighbors or their important people expect the respondents in terms of their behavior of recycling-related purchase, use, reuse, and disposal. The questionnaire for subjective norms consists of 8

items. Prior recycling behavior was measured with 4 questions about their specific behavior before the mandatory policy, such as recycling empty bottles and cans, exerting an effort to reduce the amount of garbage, refraining from the use of disposable items, and donating or exchanging old clothes and furniture. Also, the respondents were asked to answer whether they were participating in recycling, and if they were, when they started to recycle, i.e., 2 years prior, 1-2 years prior, or after the implementation of mandatory recycling. Through the procedure data was collected on specific behavior of the respondents before the implementation of mandatory recycling policy in terms of the period of voluntary recycling and specific prior recycling behavior.

Recycling behavior is operationally defined as whether consumers actually perform various recycling-related behaviors. The measures include 8 items in total, encompassing recycling-related purchase, reuse, and disposal, such as refraining from purchases of disposable or excessively packaged items, purchasing refillable or recycled items, sorting recyclable items, wiping wastes oil with tissue before washing, cleaning milk cartons with water, and cleaning empty bottles or aluminum cans.

IV. RESULTS

4.1 Validity and Reliability of Measures

The measurement constructs of values on specific recycling behavior, individualism/collectivism, visibility were tested for validity with a factor analysis and for reliability

with Cronbach Alpha. The value measures of specific recycling behavior yielded one factor excluding 3 items with Cronbach Alpha of .92. This measurement was already validated in the previous Bagozzi and Dabholker's study(1994). With respect to the individualism/collectivism measures, we expected two separate and opposite dimensions of individualism and collectivism.

<Table 1> Factor Analysis Result of Attitude toward Recycling

| Variable \ Factor | Environment Preservation (.86) | Regulation Imposition (.81) | Recycling Purchase (.62) | Inconvenience Perception (.60) | Recycling Program (.65) |
|-------------------------|--------------------------------|-----------------------------|--------------------------|--------------------------------|-------------------------|
| ATT 1. | 0.86 | 0.18 | -0.04 | -0.03 | 0.04 |
| 2 | 0.86 | 0.15 | -0.02 | 0.01 | 0.10 |
| 3 | 0.82 | 0.19 | 0.00 | 0.04 | 0.08 |
| 4 | 0.67 | 0.33 | -0.10 | 0.10 | 0.07 |
| ATT 5 | 0.13 | 0.83 | -0.07 | -0.02 | 0.00 |
| 6 | 0.12 | 0.79 | -0.03 | -0.07 | 0.01 |
| 7 | 0.29 | 0.78 | 0.02 | 0.01 | -0.03 |
| 8 | 0.33 | 0.65 | -0.06 | -0.10 | 0.01 |
| ATT 9 | -0.17 | -0.02 | 0.70 | 0.14 | 0.07 |
| 10 | -0.06 | 0.00 | 0.69 | 0.12 | -0.05 |
| 11 | 0.02 | -0.15 | 0.68 | -0.06 | -0.12 |
| 12 | 0.08 | 0.06 | 0.60 | 0.02 | 0.26 |
| ATT 13 | -0.08 | -0.01 | 0.11 | 0.85 | -0.05 |
| 14 | 0.08 | 0.03 | -0.05 | 0.76 | 0.19 |
| 15 | 0.11 | -0.29 | 0.28 | 0.59 | -0.11 |
| ATT 16 | 0.10 | -0.06 | 0.12 | 0.07 | 0.84 |
| 17 | 0.10 | 0.05 | -0.04 | -0.01 | 0.83 |
| Eigenvalue | 4.170 | 2.293 | 1.583 | 1.434 | 1.253 |
| Variance Explained | 24.527 | 13.490 | 9.312 | 8.436 | 7.371 |
| Acc. Variance Explained | 24.527 | 38.017 | 47.329 | 55.765 | 63.135 |

* () means Cronbach Alpha.

However, the factor structure of individualism measures yielded an inconsistent pattern. Also, unexpectedly, the individualism construct was positively related with the collectivism construct. That is, respondents had higher positive score of collectivism and that of individualism at the same time. This might result from the unique oriental culture that people are basically obliged to collective values or norms while some portion of people still hold individualistic values. Thus, the individualism construct was deleted in the following analyses. The collectivism construct showed Cronbach of .72.

The perceived visibility construct has also a high reliability coefficient of .81. These

three constructs were used independent variables in the following analyses after averaging the item values.

The construct of attitude toward recycling with 20 measure items was analyzed with a factor analysis. The results are shown in <Table 1> below. The factor structure has five dimensions each of which is above eigenvalue 1, excluding 3 items. On the whole, they are previously identified dimensions in the measurement section, which are interpreted as attitude toward environment preservation, regulation imposition and participation, purchase related recycling, awareness of inconvenience, and local recycling program. All the coefficients exceeded the acceptable level with lowest value of

<Table 2> Factor Analysis Results of Subjective Norms and Recycling

| Factor | Subjective Norms | | Recycling Behavior | |
|-------------------------|---------------------------|---------------------------|---------------------------|---------------------------|
| | Purchase-related (.75) | Disposal-related (.67) | Disposal-related (.81) | Purchase-related (.70) |
| | 0.842 | 0.1078 | 0.812 | 0.113 |
| | 0.827 | 0.1904 | 0.782 | 0.150 |
| | 0.686 | 0.3068 | 0.777 | 0.195 |
| | 0.084 | 0.7578 | 0.749 | 0.306 |
| | 0.196 | 0.6905 | 0.135 | 0.780 |
| | 0.342 | 0.6659 | 0.208 | 0.775 |
| | 0.135 | 0.620 | 0.189 | 0.756 |
| Eigenvalue | 3.0057 | 1.0634 | 3.2817 | 1.1997 |
| Variance Explained | 42.938 | 15.192 | 46.8808 | 17.1379 |
| Acc. Variance Explained | 43.938 | 58.131 | 46.8808 | 64.0187 |

.60 (Nunally, 1978).

The measures of subjective norms yielded two factors: purchase-related subjective norms and disposal-related subjective norms. Both dimensions have acceptable reliability coefficients. This factor structure corresponds to Taylor and Todd's (1995) finding which have two dimensions of internal and external to the household. The measures of recycling behavior yielded two factors corresponding to the subjective norm measures: purchase-related recycling behavior and disposal-related recycling behavior. The finding also matched Biswas et al.'s (2000) study in which waste recycling behavior and recycling shopping behavior correspond to purchase-related behavior and disposal-related behavior in this study, respectively.

4.2 Analyses

4.2.1 Difference in recycling behavior before and after mandatory recycling implementation.

95% of the respondents were aware of the recent implementation of mandatory recycling policy in their community. 29.6% of the respondents answered the policy had been imposed very strongly and 60.0% responded somewhat strongly, which reflected a successful start of the mandatory recycling policy.

Differences in specific recycling behavior between before and after the mandatory recycling policy were measured for separating recyclable items, exerting an effort to reduce trash, and refraining from using disposable items on the same 5-point Likert scales. The average values of these three items were 3.3 before the mandatory policy, but 4.2 after the mandatory policy ($t=4.78$, $p<.01$). This means that most of respondent changed their recycling behavior significantly after the policy implementation and most of them observed the policy, supporting H1.

The respondents were classified into four groups according to the starting periods of recycling behaviors. 13.8% of the respondents reported that they had started recycling 2 years before the implementation of mandatory recycling and had been recycling for more than 2 years, and 19.2% of the respondents reported on having started sometime within the past 2 years. The majority (63.7%) of the respondents reported on having started after the mandatory recycling policy, and 3.4% had not yet participated in recycling. ANOVA analyses were conducted to test the differences in the levels of disposal-related and purchase-related recycling behaviors among the four groups as shown in (Table 3).

The groups with early recycling experience such as innovators and early adopter showed more extensive recycling behaviors of pur-

<Table 3> Comparisons of Recycling Behavior among Recycling Groups

| Group | Disposal-related Behavior | Purchase-related Behavior |
|---------------------------|---|--|
| 2 years before | 4.636 ^{a1} (.736) | 4.01 ^{a1} (.732) |
| 1-2 years before | 4.161 ^{b1} (.718) | 3.62 ^{b2} (.565) |
| After mandatory recycling | 4.022 ^{c1} (.681) | 3.59 ^{c2} (.668) |
| Non-participants | 3.083 ^{d1} (1.159) | 3.33 ^{d2} (1.00) |
| F value | 20.146 | |
| Significance | .000*** | .000*** |
| Contrast | a ¹ · b ^{1***} a ¹ · c ^{1***} a ¹ · d ^{1***} b ¹ · d ^{1***} c ¹ · d ^{1***} | a ² · b ^{2*} a ² · c ^{2***} a ² · d ^{2**} |

chase and disposal behaviors than the groups with later or no recycling experience. Especially, the earliest group showed higher level of recycling behavior. They might take a role of innovators in new technology or idea diffusion. These results indicate that the mandatory recycling policy affected the respondents' recycling behavior, supporting H2.

4.2.2 The Effect of Personal Value on Recycling on Attitude toward Recycling and Subjective Norms.

H3 concerns the effect of personal value on recycling behavior on attitude toward recycling. To test this hypothesis, multiple regression analyses were performed and the results were shown in <Table 4>. Values on

<Table 4> The Effect of Value, Collectivism, and Visibility on Attitude and Subjective Norms

| | Attitude toward recycling | | | | | Subjective Norms | |
|--------------|--------------------------------|--------------------------------|---------------------------------|---------------------------------|---------------------------------|--------------------------------|--------------------|
| | ATT 1 | ATT 2 | ATT 3 | ATT 4 | ATT 5 | SN 1 | SN 2 |
| Values | .240 (4.891)*** | .235 (4.651)*** | -.053 (-.930) ^{n/s} | -.011 (-.192) ^{n/s} | -.020 (-.361) ^{n/s} | .101 (1.952) ^{n/s} | .152 (3.160)* |
| Collectivism | .335 (6.630)*** | .289 (5.549)*** | -.052 (-.895) ^{n/s} | -.098 (1.694) ^{n/s} | .233 (4.121)*** | .257 (4.841)*** | .223 (4.464)*** |
| Visibility | .074 (1/539) ^{n/s} | .064 (1.288) ^{n/s} | .017 (.305) ^{n/s} | -.033 (-.592) ^{n/s} | .063 (1.170) ^{n/s} | .210 (4.152)*** | .338 (7.109)*** |
| R Square | .248 | .203 | .007 | .013 | .063 | .173 | .267 |
| Adj R | .242 | .196 | -.002 | .005 | .055 | .166 | .261 |

recycling positively affected the dimensions of attitude toward recycling, such as attitude toward environment preservation and regulation imposition, and also the dimensions of purchase-related and disposal-related subjective norms. Thus, H3 and H4 are supported by the data.

4.2.3 The Effect of Collectivism on Attitude toward Recycling and Subjective Norms

H5 and H6 state the positive effect of collectivism and negative effect of individualism on attitude toward recycling and subjective norms. As previously mentioned, the individualism dimension was deleted due to the inconsistent pattern. Thus, only collectivism was tested for the positive effect of attitude on recycling and subjective norms with the same regression analyses as shown in <Table 4> above.

The level of respondents' collectivism positively influenced the dimensions of attitude toward environment preservation and regulation imposition, and disposal-related subjective norms. Therefore, H5 and H6 were supported by the data.

4.2.4 The Effect of Perceived Visibility on Attitude toward Recycling and Subjective Norms

H7 states that perceived visibility po-

sitively affects subjective norms. As shown in <Table 4>, the perceived visibility greatly affected subjective norms, especially for disposal-related subjective norms, supporting H7. However, this perceived visibility affected none of the attitude dimensions. The results show that the social factor of perceived visibility is closely related to subjective norms which are formed by the perception of other people's expectation of the individual.

Aside from this hypothesis, an interactive effect of visibility with subjective norms on recycling behavior was suggested in the Dahab, Gentry, and Su's (1994) study. To test this aspect, a regression analysis was conducted with subjective norms, attitude toward recycling, and a multiplicative interactions between each of the two dimensions of subjective norms and perceived visibility on two dimensions of recycling behaviors. None of the 4 multiplicative terms were statistically significant. These results illustrate that the perceived visibility affects subjective norms which, in turn, influence recycling behavior, rather than affect recycling behavior interactively with subjective norms.

4.2.5 The Effect of Attitude toward Recycling, Subjective Norms, and Past Recycling Behavior on Present Recycling Behavior

H8 was tested with three widely studied

independent variables on each of two dimensions of recycling behaviors. This study focuses on which dimensions of attitude toward recycling influence recycling behavior greatly. We also examined the relative magnitudes of the three independent variables on recycling behaviors in an attempt to increase its explanatory power.

As shown in <Table 5>, the dimensions of attitude toward environment preservation and local recycling program positively influenced the disposal-related recycling behavior, and the dimension of inconvenience percep-

tion due to recycling negatively affected purchase-related behavior. The purchase-related subjective norm dimension positively affected corresponding purchase-related recycling behavior while disposal-related subjective norm dimension positively influenced both disposal-related and purchase-related recycling behaviors.

Past recycling behavior positively affected both present disposal-related and purchase-related recycling behaviors. Thus, all the three independent variables were found to affect recycling behavior, supporting H8.

<Table 5> The Effect of Attitude, Subjective Norms, and Past Behavior on Recycling Behavior

| | Disposal-related Behavior | | | Purchase-related Behavior | | |
|--------------------|----------------------------------|----------------------------------|----------------------------------|--------------------------------|--------------------------------|--------------------------------|
| ATT 1 | .302 (5.557)*** | .176 (3.359)** | .169 (3.317)** | .200 (3.473)** | .075 (1.343) ^{n/s} | .65 (1.230) ^{n/s} |
| ATT 2 | .133 (2.466)* | .076 (1.520) ^{n/s} | .080 (1.637) ^{n/s} | .075 (1.361) ^{n/s} | .011 (.205) ^{n/s} | .016 (.305) ^{n/s} |
| ATT 3 | -.100 (-2.010)* | -.071 (-1.552) ^{n/s} | -.078 (-1.759) ^{n/s} | -.002 (.046) ^{n/s} | .019 (.385) ^{n/s} | .009 (.202) ^{n/s} |
| ATT 4 | -.090 (-1.828) ^{n/s} | -.081 (-1.773) ^{n/s} | -.061 (-1.356) ^{n/s} | -.167 (-3.211)** | -.141 (-2.910)* | -.115 (-2.458)* |
| ATT 5 | .143 (2.928)* | .099 (2.148)* | .103 (2.299)* | .112 (2.164)* | .047 (.955) ^{n/s} | .052 (1.108) ^{n/s} |
| SN 1 | | .051 (.992) ^{n/s} | -.002 (-.036) ^{n/s} | | .186 (3.388)** | .117 (2.175)* |
| SN 2 | | .369 (6.943)*** | .297 (5.517)*** | | .296 (5.234)*** | .202 (3.588)*** |
| Past behavior | | | .230 (4.705)*** | | | .298 (5.853)*** |
| R ² | .208 | .334 | .374 | .112 | .251 | .318 |
| Adj R ² | .196 | .321 | .360 | .099 | .236 | .303 |

The magnitude of the effects among these variables was almost equally higher for subjective norms and past recycling behavior and lower for attitude toward recycling. The result shows a quite difference from that of the previous study (e.g., Biswas et al., 2000; Taylor and Todd, 1995) in which attitude toward recycling had the greatest effect on recycling behavior. We speculate that this might result from the socially unique characteristics of oriental culture and the innovative behavior of early recycling adoption group. Examining the change of R^2 shown in (Table 5), the subjective norms critically influenced the recycling behavior, adding explanatory power.

V. DISCUSSION

5.1 Summary of results

The present study investigated the variables that have been shown to affect recycling behavior in prior research. The variables were examined and tested empirically in order to explore their relative effects.

First, the recent mandatory recycling policy has helped raise consumer awareness of recycling. The data showed that most consumers tried to observe recycling regula-

tions. In addition, those who had started recycling voluntarily before the mandatory recycling policy showed more active recycling behaviors at the time of the study. When the respondents were grouped according to the time they started recycling, we found significant group differences in individual values, attitudes, and behavior. Based on the examination of the visibility of the in-depthness, the early adopters were found to practice more in-depth and wider recycling. Moreover, the factor analysis of recycling behavior showed two dimensions of recycling behavior: recycling mainly for a disposal purpose and recycling for a more extensive purpose encompassing the entire process of consumption.

Second, collectivism value was found to affect recycling behavior through subjective norm and attitude as mediating variables. While prior research has reported on the negative relationship between individualistic characters and subjective norms, we found consumers' duality of having collective values and at the same time individualistic characters. It is speculated that the difference may be due to the difference between western values and collective-oriented Asian values. Also, individuals' values on recycling had a direct influence on recycling attitude and subjective norm, through which they affect behavior.

Third, the theory of reasoned action model

by Ajzen and Fishbein (1980) was found to have very strong explanatory power as stated. In addition, the results indicate that subjective norm, one of the social variables, has a greater influence on recycling behavior than individual attitude which has been widely accepted and theorized. Fourth, the visibility of recycling behavior has a direct effect on subjective norm, which in turn affects recycling behavior. Therefore, it was found that consumers perceived visibility plays an important role in recycling behavior. As to the relationship between attitudes toward recycling and actual recycling behavior, previous recycling experience worked as a situational factor, and it was found that incorporating this kind of variable into a behavior model could increase its explanatory power.

5.2 Theoretical implications

This study attempted to shed light on the lack of consistency between the existing theories of the relationships among the constructs in prior research and the results from empirical data analyses. Based on the results from empirical data analyses, we suggest the following theoretical implications.

First, instead of viewing recycling behavior as a simple one-dimensional disposal behavior, we suggest that we should expand

our view and that recycling occurs in the entire consuming process of sequencing stages of purchase, use, reuse, and disposal. The future research should investigate psychological and behavioral relationships among each of the stages. Second, in classifying recycling values we contrast characteristic variables such as collectivism and personal values on recycling, from which we found that the values affected subjective norm and attitudes. This shows that the general characteristics of consumers' values and values on a specific issue and event can exist as an independent factor. Therefore, in studying values, the future research should examine not only general values but also specific values on particular issues. Third, the results of the present study show that environmental behavior, such as recycling, that needs to be adopted in the community follows the same theoretical behavioral pattern as the adoption of new products. The results indicate that research in the area of diffusion and adoption of innovation where an extensive volume of research has already been conducted can be applied to social environmental behavior.

5.3 Future Research

Most recycling research including the present study has employed asking res-

pondents about social influence variable as its research method. However, it seems to be necessary to incorporate a specific social network into the model that is closely related to the consumer's lifestyle which forms social congruence and norm. Therefore, it is suggested that future research explore the nature of social factors by analyzing certain consumer group, not just individual consumers. The informal social network closely related to consumers' lives, such as community council, has a great impact on their environmental behavior. More studies are called for to investigate the relationships between the informal social network and the rational behavioral model. It is also necessary to develop dimensions of consumers' environmental knowledge and explore knowledge category. Through this we need to study the nature of knowledge and examine consumer information processing that can shed light on how the dimension and category affect the formation of consumers' individual values and attitudes. In addition, we may extensively examine personal values by classifying them as instrumental values and terminal values as suggested by Bagozzi et al. (1996) and then relate both to the dimensions of attitudes toward recycling behaviors or subjective norms.

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소비자 리사이클링 행동의 영향요인과 의무적 리사이클링 정책*

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Abstract

본 연구는 소비자의 가치, 사전경험, 환경지식 등 리사이클링 행동에 영향을 미치는 다양한 요인을 포함하는 통합적인 접근을 시도하였다. 연구의 중점으로서 리사이클링 행동에 있어 사회적 요인을 반영하는 합리적 행동이론 모델을 적용하였다. 1994년 이래 한국정부에서 의무적 리사이클링법을 시행하고 있는데 이 법은 소비자의 리사이클링에 대한 태도와 행동에 크게 영향을 미쳤고 이에 따라 소비자의 행동에 영향을 미치는 요인에 대해서 인과관계의 이론적 틀에서 조사하고자 하였다. 리사이클링 행동은 소비자 혁신 행동과 유사하게 수용단계에 따라서 현재의 리사이클링 수준은 다르게 나타나고 있다. 즉 리사이클링을 먼저 수행한 혁신그룹은 다른 일반사람들이 대부분 리사이클링을 하고 있는 현재시점에서는 훨씬 더 심층적이며 앞서가는 정도의 리사이클링 행동을 하고 있는 것이다. 구조방정식모형에 의해 인과관계를 분석한 결과는 합리적행동 모델이 소비자 리사이클링 행동을 잘 설명해주는 모형임이 밝혀졌다. 또한 리사이클링 행동에 대한 가시성이 주관적 규범에 영향을 미치고 사전경험은 리사이클링 행동에 유의하게 영향을 미치는 요인으로 나타났다.

한글색인어: 리사이클링 행동, 리사이클링 정책, 리사이클링 법, 합리적행동 모형, 리사이클링 태도.

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