The Influence Mechanism of Class Identification and Environmental Values on Garbage Classification Behavior

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Abstract. Empirical Analysis Based on the Data of the 2015 Urban Residents Living Conditions Survey; The mediating effect model of perceived behavioral control and perceived behavioral dynamics is tested to explore the internal mechanism of public garbage classification behavior. Through the analysis of mediating effect model, we find that the class identity has direct effect on garbage classification behavior, and the mediating effect is reflected by perceived behavior control and perceived behavior dynamics. Environmental values have direct effects on garbage classification behavior and have significant mediating effects through environmental behavior control. Therefore, promoting the public green consumption idea, fostering the environment-saving habits, can enhance environmental responsibility awareness, promote the public garbage classification behavior.

Keywords: Environmental values; social identity; Waste classification behavior; Perceptual behavior control

1. Introduction
The source separation of municipal solid waste is the most effective solution to the problem in China because of the shortage of municipal solid waste landfill space, the quality and level of modernization construction. The effective development of urban garbage sorting needs to improve people's awareness of garbage sorting. Not only can improve the recycling efficiency of garbage, reduce the disposal cost of garbage, achieve the goal of waste minimization and resource recycling. This paper systematically combs related literature, constructs the model of the influence mechanism of the classification behavior of garbage, provides policy reference for the classification management of garbage.

2. Literature review and research hypothesis

2.1. The Influence Mechanism of Class Identity on Garbage Classification Behavior
The Application of Planning Behavior Theory to Validate the Influential Factors Model of Garbage Classification Behavior at Home and Abroad. Perceived behavioral control has been referred to as the perception of the ease with which self-efficacy and performance can be achieved. Perceived Behavior Motivation is the Perceived Motivation factor when an individual performs a certain Behavior[1]. Satisfaction as internal motive plays an important role in public garbage recycling behavior. This paper
tries to verify the effect of stratum identification on garbage classification behavior and proposes the following assumptions:

Hypothesis 1: The higher the level of public recognition, the greater the likelihood of garbage sorting behavior.

Hypothesis 2: The mediation effect of perceived behavior control by social stratum identity affects the classification behavior of public garbage.

Hypothesis 3: the mediating effect of perceived behavioral dynamics on the classification behavior of public garbage is influenced by class identity.

2.2. The Influence Mechanism of Environmental Values on Garbage Classification Behavior

Environmental values [2] are the fundamental views of the individual on environmental and environmental issues based on his outlook on life. Christian [3] points out that perceived behavior control and perceived behavior dynamics act as mediating effects between values and behavioral pathways, effect of perceived behavioral control has direct effect on environmental behavior. Therefore, the following assumptions are put forward in this paper:

Hypothesis 4: The higher the level of public environmental values, the greater the likelihood of performing garbage sorting activities.

Hypothesis 5: The mediating effect of perceived behavior control on environmental values affects the classification behavior of public garbage.

Hypothesis 6: Environmental values influence the behavior of the public based on the mediating effect of perceived behavioral dynamics

Based on the above theory and literature review, between hierarchical identity and environmental values on garbage classification behavior is constructed as shown in Figure 1.

3. Data and variable measurement

The data in this paper come from two-stage sampling method was used in the survey. The first stage was a random map sampling method. A total of 2864 permanent sample data were obtained, the final number of samples for statistical analysis after deletion of singular values is 2254, the descriptive statistics of the sample are shown in Table 1.
Table 1. Descriptive statistical analysis results for variables

| Type            | Variable                        | Assignment                                                                 | Average Value | Standard Deviation |
|-----------------|---------------------------------|----------------------------------------------------------------------------|----------------|--------------------|
| Control variables | Gender                         | 1 = men; 2 = women                                                         | 0.0447         | 0.497              |
|                 | Age                             | 18-65 years old                                                           | 41.293         | 13.623             |
|                 | Marital status                  | 1 = partner; 2 = no partner                                               | 0.769          | 0.422              |
|                 | Account type                    | 1 = agriculture; 2 = non-agricultural; 0 = not in school; 6 = elementary   | 0.802          | 0.399              |
|                 | The degree of education         | school; >=15 = university and above                                        | 12.891         | 3.452              |
| Independent variables | Annual household income       | Take the log of household income plus 1                                    | 11.681         | 1.446              |
|                 | Annual household expenditure    | Take the log of household expenditure plus 1                               | 11.213         | 1.047              |
|                 | Village modelling               | Old city commercial housing, villas, senior residential areas             | 2.539          | 0.849              |
|                 | Residential quality             | Property cost plus 1 is the logarithm 1 to 5 goes from the bottom to the top | 0.719          | 0.960              |
|                 | Class identification values     | 6 minus 1 goes from very good to very bad                                 | 5.084          | 1.080              |
|                 | Environmental values            |                                                                           |                |                    |
|                 | Perceptual behavior control     | 4 to 1 means from strongly agree to strongly disagree                      | 2.971          | 0.909              |
|                 | Perceived behavioral motivation | 5 to 1 means from very satisfied to very dissatisfied                      | 11.809         | 1.773              |

4. Analytical strategy
The mediating effect is tested by Sobel test formula in recent years. This article analyzes the steps as follows:

Step 1: Build four regression models.
Model 1. Basic model, check the total effect of control variables and independent variables on garbage classification behavior [4], and Logistic regression of dependent variable y on independent variable x. Add series of control variables into the model and equation (1).

\[ y_i = c_0 + c_1 x_{1i} + c_2 x_{2i} + c_3 \text{control}_i + b_1 M_{1i} + b_2 M_{2i} + \epsilon_i \]  \hspace{1cm} (1)

Check the regression coefficients \( C_1 \) and \( C_2 \) in model 1, if significant, enter model 2 otherwise stop analysis. Based on Model 1, the mediator variables \( M_1 \) and \( M_2 \) are brought into logistic regression equation (2).

\[ y_i = c_0 + c_1' x_{1i} + c_2' x_{2i} + c_3' \text{control}_i + b_1 M_{1i} + b_2 M_{2i} + \epsilon_i \]  \hspace{1cm} (2)

Model 3. Take \( M_{1i} \) as the dependent variable, put independent variables and control variables into the regression model, and enter the regression equation (3).

Model 4. \( M_{2i} \) as dependent variable, the independent and control variables into the regression model, into regression equation (4).

\[ M_{1i} = a_0 + a_1 x_{1i} + a_2 x_{2i} + a_3 \text{control}_i + \epsilon_i \]  \hspace{1cm} (3)

\[ M_{2i} = a_0 + a_1 x_{1i} + a_2 x_{2i} + a_3 \text{control}_i + \epsilon_i \]  \hspace{1cm} (4)

Step two: standardization.
Found that for the dependent variable of dichotomies, the number scale of Logistic regression was different, and the mediating effect could not be calculated. Therefore, the regression coefficient a obtained in the first step is converted to a uniform scale by a standardized method, as shown in equations (5) and (6). The transformation method of regression coefficients \( b \) and \( c' \) is the same as above.

\[ a_{\text{std}} = a \frac{SD(M)}{SD(X)} \]  \hspace{1cm} (5)
\[
SE(a^{\text{std}}) = SE(a) \times \frac{SD(M)}{SD(X)}
\]

(6)

Step 3: Do the Sobel test

According to the existing literature, coefficient product \(ab^{\text{std}}\) is optimal. The mediation effects of \(M_1\) and \(M_2\) were examined and the mediating effects were compared. Standard errors of standardized regression coefficients can be introduced into Sobel [5] Formula (7).

\[
SE(ab^{\text{std}}) = \sqrt{(b^{\text{std}})^2(SE(a^{\text{std}}))^2 + (a^{\text{std}})^2(SE(b^{\text{std}}))^2}
\]

(7)

Test statistic \(Z = \frac{ab^{\text{std}}}{SE(ab^{\text{std}})}\). Because the critical probability \(p<0.05\) under MacKinnon normal distribution curve is greater than 1.96. The effect is judged and the proportion of mediation effect to total effect is calculated as \(\frac{ab^{\text{std}}}{ab^{\text{std}} + c^{\text{std}}}\).

5. Analysis of results

According to the analysis strategy, the regression model of public garbage classification behavior is divided into four models[6]. Shown in Table 2.

| Table 2. Logistic regression model of influencing factors of public waste classification |
|-------------------------------|-------------------|-------------------|-------------------|-------------------|
| Variable name                  | Model one Waste classification behavior | Model two Waste classification behavior | Model three Perceptual behavior control | Model four Perceptual behavioral motivation |
| gender                         | -0.193 (0.082)    | -0.211 (0.082)    | 0.40 (0.065)      | 0.060 (0.035)     |
| age                            | 0.008*** (0.004)  | 0.008*** (0.004)  | 0.005 (0.003)     | 0.000 (0.002)     |
| Marriage B                     | 0.025 (0.025)     | 0.033 (0.015)     | 0.069 (0.015)     | -0.070 (0.020)    |
| The degree of education        | 0.048*** (0.015)  | 0.049*** (0.016)  | 0.023' (0.012)    | -0.020*** (0.007) |
| Annual household income        | 0.011 (0.036)     | 0.006 (0.036)     | 0.009 (0.029)     | 0.019 (0.016)     |
| Annual household consumption   | 0.117*** (0.050)  | 0.120*** (0.050)  | 0.010 (0.038)     | -0.008 (0.021)    |
| The unit                       | 0.178 (0.143)     | 0.173 (0.143)     | 0.074 (0.116)     | -0.017 (0.063)    |
| community                      | 1.055*** (0.251)  | 0.995*** (0.252)  | 0.211 (0.170)     | 0.283*** (0.092)  |
| villa                          | 0.13*** (0.046)   | 0.123*** (0.046)  | 0.075' (0.036)    | 0.022 (0.019)     |
| Residential quality            | 0.193*** (0.052)  | 0.172*** (0.052)  | 0.123' (0.041)    | 0.073*** (0.022)  |
| Class identification           | 0.108*** (0.038)  | 0.055*** (0.040)  | 0.550** (0.030)   | 0.010 (0.016)     |
| Environmental values           | 0.091*** (0.025)  | 0.151*** (0.025)  | 0.045 (0.045)     |                  |
| Perceptual behavior control    | 0.236*** (0.568)  | -0.430*** (0.629) | 7.832*** (0.440)  | 2.941*** (0.238)  |
| Perceived behavioral motivation | 0.256 (2656)      | 2653 (2653)       | 2653 (2653)       | 2656 (2656)       |

Notes: (1) ***P<0.01, **p<0.05, *p<0.1; Standard error for coefficients in parentheses; (2) Type of reference: a. Female, b. Partnerless. c. Agricultural accounts. d. Old urban areas, guaranteed housing areas and others

The results of model 1 show that the family income is higher in the implementation of garbage classification behavior, especially in female and elderly. For every 1 unit raised in level, the rate of
garbage classification increased by 19.3% and 10.8% respectively. Hypothesis 1 and hypothesis 4 are verified.

Model 2 based on model 1. Each additional unit of perceived behavioral control and perceived behavioral dynamics, the rate of public garbage classification behavior increased 9.2% and 15.1%, which had positive significant effects.

The model 3 hierarchy identity the coefficients $a_2=0.123$, $p<0.001$, respectively. $a_4=0.550$, $p<0.001$ has a significant positive effect.

Model 4 examines the influence of social class identification and environmental values on perceived behavioral dynamics as dependent variables, respectively, for social class identity and environmental values. $a_3=0.010$, $p>0.01$. To validate the mediation effect, the results are shown in Table 3.

**Table 3.** direct and mediating effects of class identity and environmental values on garbage classification behavior

| kinds of effect                              | Class identification | Environmental values | Perceptual behavior control | Perceived behavioral motivation |
|---------------------------------------------|----------------------|----------------------|----------------------------|-------------------------------|
| Total effect                                | $C_1=0.193$          | $C_2=0.108$          | —                          | —                             |
| Direct effect                               | $C_1=0.172$          | $C_2=0.055$          | $b_1^{\text{std}}=0.328$   | $b_2^{\text{std}}=0.280$     |
| Perceptual behavior control                 | $a_1^{\text{std}}=0.060$ | $a_3^{\text{std}}=0.335$ | —                          | —                             |
| Hierarchical identity - mediating effect of garbage classification behavior /% | —                     | —                     | 6.15                       | 9.23                          |
| Environmental values mediating effect of garbage sorting behavior /% | —                     | —                     | 47.41                       | No mediation effect           |

Environmental Values-Perceived Behavior Control-Garbage Sorting Behavior in the Path, $Z_4=3.577>1.96$, the mediating effect of perceived behavioral control accounted for 47.41% of the total effect. Hypothesis 5 is verified. As a result, the model of the effect of class identity and environmental values on garbage classification behavior is obtained, as shown in Figure 2.

**Figure 2.** The influence mechanism model of stratum identification and environmental values on garbage classification behavior

6. **Conclusion**

The old people have a strong sense of thrift, which can bring some economic benefits and is more willing to implement garbage classification behavior under the influence of traditional concept. Young people work at a fast pace and have less leisure time, thus creating an objective obstacle to implementing garbage sorting activities. The income level cannot represent the same level of consumption and its matching consumption concept which plays a decisive role in the willingness to pay for the environment.
The higher the level of infrastructure construction and property management service, the more the habit of garbage classification is formed and the possibility of garbage classification behavior is increased.

Based on the existing research on the classification behavior of garbage, test the impact of socioeconomic status, situation and psychosocial factors on the classification behavior of public garbage. The influence mechanism of class identity and environmental values on garbage classification behavior is also analyzed.

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