The impact of informational, convenience, social, and financial tools on waste sorting behavior in Lithuania.

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Introduction

The rising level of household production and consumption of goods, particularly in developed countries, is a major challenge today (Jekria and Daud, 2016). With the emergence of the COVID-19 pandemic, the issue of plastic waste generation became more acute (Sarkodie and Owusu, 2021). Particularly during 2019 in Lithuania, about 25% of municipal waste was disposed of in landfills. However, policymakers took it as a great challenge to improve the situation in the waste problem field (Minelgaitė and Liobikienė, 2021). During recent years, waste sorting was analyzed rather intensively. With help of different theories, authors analyzed different waste sorting behavior determinants and how to promote them and distinguished the main tools as informational, convenience, social, and financial. In this paper, we examined which one of the main tools assigned to the promotion of waste sorting behavior and influence waste sorting behavior. This study sought to determine which ones of the main tools are the most effective in the promotion of waste-sorting, based on public opinion. To the best of our knowledge, none of the authors analyzed them in one paper. Moreover, it is planned to expand our study and reveal the impact of the COVID-19 pandemic on waste sorting and resource-saving behavior in Lithuania.

Materials and methods

The data for analysis was derived from a representative survey conducted by an independent public opinion and market research institution "Rait" between January 10 and February 1, 2020. The survey was conducted before the COVID-19 pandemic, so this analysis revealed a true situation unaffected by health, economic, or social factors using face-to-face and quota sampling methods, considering the proportion of population age, gender, and place of residence. In the survey, 1027 respondents were interviewed. All items were measured using a four-point Likert scale ranging from strongly disagree (1) to strongly agree (4). To group statements into the common scales and validate the constructs factor analysis, applying varimax rotation was used. The normality was checked using residual probability plots. The test of the constructs' validity was evaluated by applying Pearson Product Moment Correlation. To reveal the impact of listed tools on waste sorting behavior, Generalized Linear Regression (GLM) was applied as well as VIF statistics (Table 3).

Results

Following the results of factor analysis and (Table 1), the reliability and validity of all constructs were adequate (Cronbach's Alpha 0.65-0.92). The loading coefficients of items exceeded the 0.5 limits. As a result, it demonstrated the suitability of constructs.Table 1. Rotated component matrix of analysed constructs, reliability statistics and mean score

		Loading coefficients	Variance Explanation (%)	Cronbach alpha	Mean	Standard deviation
Informational			**16.19**	**0.867**	**3.27**	**0.69**
	Q1	0.707			3.26	0.81
	Q2	0.75			3.34	0.77
	Q3	0.72			3.26	0.82
	Q4	0.69			3.23	0.83
Convenience			**3.94**	**0.71**	**3.38**	**0.63**
	Q1	0.51			3.53	0.69
	Q2	0.69			3.26	0.81
	Q3	0.79			3.35	0.82
Social			**8.57**	**0.79**	**2.83**	**0.81**
	Q1	0.64			2.95	0.97
	Q2	0.85			2.52	1.08
	Q3	0.68			3.01	0.91

Financial		**4.87**	**0.65**	**3.56**	**0.61**
Q1	0.65			3.58	0.68
Q2	0.86			3.56	0.72
Waste sorting		**39.8**	**0.92**	**3.21**	**0.82**
Q1	0.91			3.17	0.89
Q2	0.87			3.18	0.92
Q3	0.89			3.26	0.88
Q4	0.88			3.24	0.92
KMO = 0.92, Sig. of BTS < 0.001, Cum. Var. Explained (%) = 68.43%.					

The results of Pearson Product Correlation (Table 2) revealed that between independent variables correlation coefficient did not exceed the level 0.7 and it specified a tolerable level of discriminant validity. As a result, all variables were statistically dissimilar from one another. Also, for this study multicollinearity is not the case because correlation coefficients between the independent variables did not exceed 0.8.

Table 2. Correlation matrix

	Convenience tool	Financial tool	Social tool
Informational tool	0.529*	0.574*	0.646*
Convenience tool	1	0.593*	0.456*
Financial tool	0.593*	1	0.312*
Social tool	0.456*	0.312*	1
*p<0.05			

According to the results after performing the regression analysis (Table 3) only informational and financial tools has a positive and significant impact on waste sorting behavior. Meantime, according to Lithuanian citizens' opinion informational tools as well, as social tools were statistically insignificantly related to this behavior. The VIF statistics revealed that all factors are suitable for regression analysis (tolerance factors >0.1, VIF value <4).

Table 3. Regression results of intention to sort waste and Test of collinearity.

Factors/determinants	Beta coefficient	t	Sig.	Tolerance	VIF
Informational tool	0.28	5.99	<0.01	0.56	1.76
Convenience tool	0.04	0.94	0.34	0.52	1.94
Financial tool	0.10	2.61	0.001	0.57	1.75
Social tool	-0.03	-0.70	0.48	0.39	2.55
R^2=0.13 dependent variable – waste sorting behaviour					

Discussion and conclusion

The results showed that among declared tools, only informational and financial ones had a significant impact on waste sorting behavior. Meanwhile, social and convenience tools insignificantly affected this behavior. Respondents are sure that the most effective motivator of sorting is a financial tool (incentive, tax reduction). However, implementation of this tool is difficult, and system monitoring and accounting are hard in urban areas. As a result, policymakers in Lithuania have yet to consider the incentive mechanism. When compared to previous tools, the informational tool is less important, particularly in terms of increasing environmental awareness. It may be related to the fact that raising environmental awareness takes too long and appears inefficient in the short term. Meanwhile, the provision of information indicating that sorted waste is recycled was deemed critical. As a result, the level of trust in waste management is critical. In a conclusion it can be said that the provision of information and raising environmental awareness are particularly important, as well as increasing personal responsibility level, that can be stimulated with a financial tool.

Literature

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