Effects of social influence and educational interventions on household organics recycling: Evidence from alternative curbside organics recycling programs

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Selected Poster prepared for presentation at the 2022 Agricultural & Applied Economics Association Annual Meeting, Anaheim, CA; July 31-August 2

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Motivation

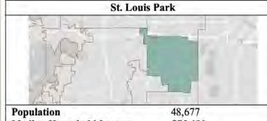
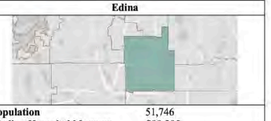
- Organics recycling has drawn increasingly public attention, as approximately one-third of trash is comprised of organic materials such as food scraps, food-soiled paper, and certified compostable products.
- Increasing amounts of food waste and organics materials in trash leads to myriad problems with environmental, social, and economic consequences.
- Diverting and reducing the levels of organics from landfills require access to organics recycling services and household commitment to source separation.
- Hennepin County, Minnesota, passed an ordinance in November 2018 that requires cities with more than 10,000 residents to provide curbside collection of organics materials by January 2022.
- As of June 2020, about 59,000 county households, accounting for 17% of total households in Hennepin County, participated in municipal organics recycling programs.
- Interventions to encourage pro-environmental behavior among urban residents have been widely evaluated by many authors, but there is no unanimous approach and sufficient evidence to favor one approach over another

Research Questions

- Will people generate more organics if they are more knowledgeable about doing organics recycling in an appropriate ways?
- Will people generate more organics if they are encouraged to do organics recycling activity as their daily recycling sorting activities?

Study Sites

Table 1:Summary of organics recycling programs in two cities as the study sites

St. Louis Park		Edina	
			
Population	48,677	**Population**	51,746
Median Household Income	$75,690	**Median Household Income**	$99,295
Total area	10.6 sq. mi.	**Total area**	15.4 sq. mi.
Density	4568.20 / sq mi.	**Density**	3320.51 / sq mi.
• Organics recycling curbside collection started in 2014 by requesting to sign up (an opt-in program). • Participation rate almost doubled from 2017 to 2018 because of removing the additional premium fee. • Currently, about 8,602 households participating (37.7% of total households in St. louis park). • Carts are available in 30- and 60-gallon sizes.		• In June 2020, the city initiated city-wide residential curbside collection program as an opt-out program and provided an organics recycling cart to all single-family, double, and multi-unit properties up to eight. • As of the time of this study about 6,540 households participated in organics recycling and put their cards on the curbside for collection (30% of total households in Edina). • Organics recycling cart is a 35-gallon size.	

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Study design

- Study was constructed as a randomized controlled trial with collaboration with the cities of Edina and St. Louis Park more than 630 households (280 Edina and 358 St. Louis Park) were recruited to be participants.
- Two types of messaging were used as treatments and delivered to households through 1- to 2-minute-long video clips.
- **Educational messaging** informed targeted households by naming specific items that should be added to organics recycling.
- **Social influence messages** from another city resident with an inviting and encouraging tone regarding the ease and benefits of organics recycling.

- Study period: Jun-July 2021
- Collaborating with cities of St. Louis Park and Edina, Minnesota

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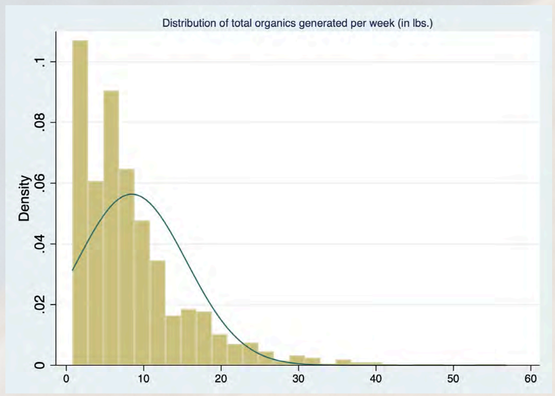
Table: Number of participating households

Study groups	St. Louis Park (276 households)	Edina (205 households)
Treatment group 1: Educational intervention	84	75
Treatment group 2: Social influence intervention	102	68
Control group:	90	62
Total number of study households	481	

Outcomes of Interest

Fig. 1:Distribution of the total amount of organic waste generated and discarded over study period (in lbs. and the number of compostable liner bags)



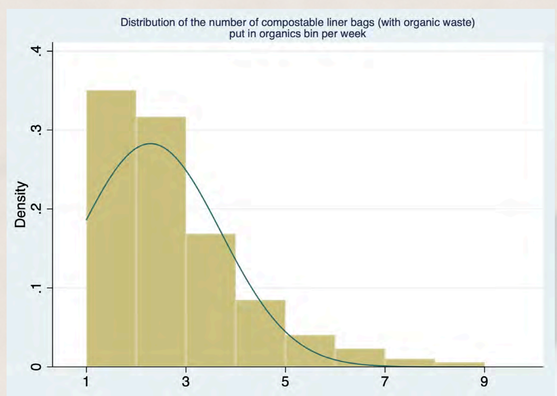
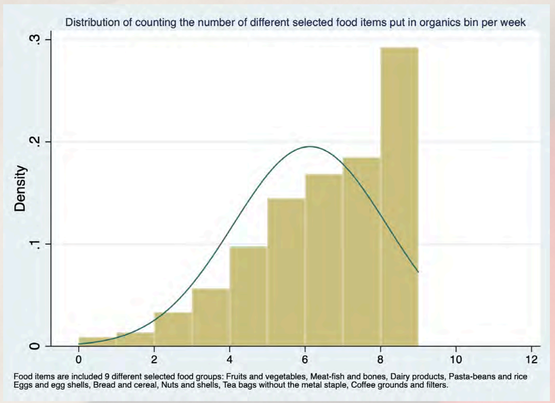
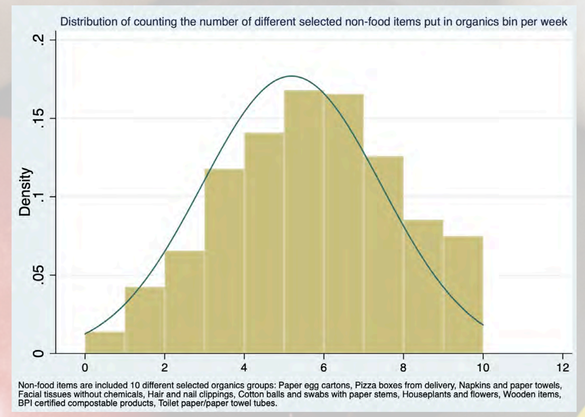


Fig. 2:Distribution of the total number of different food items and non-food organics items put out in organics recycling bin over study period





Model Specification

- We use the following empirical regression model to estimate the effect of social influence and educational interventions on the weekly amount of organics waste discarded and food and non-food organics item put out:

$$Y_i = \beta_0 + \beta_1 Treatment_i + \beta_2 City_i + \beta_3 Treatment_i \times City_i + \delta_{ki} X_{ki} + W_w + \varepsilon_i$$

Result

Table 2:Summary of organics recycling behavioral outcome variables for each city and total sample

Outcome variables: Practice of organics recycling	St. Louis Park mean/sd	Edina mean/sd	Total sample mean/sd
The amount of effort	6.98	6.86	6.93
	(2.81)	(2.63)	(2.74)
The level of confidence putting out as much organics as possible	8.13	7.82	8.00
	(2.04)	(2.03)	(2.04)
The level of confidence did not include non-acceptable items in organics cart	9.12	8.76	8.97
	(1.26)	(1.36)	(1.31)
The strength of doing organics recycling as a habit	8.73	8.42	8.60
	(1.77)	(1.73)	(1.76)
Observations	1656	1230	2886

Table 3:The effect of educational and social influence on the amount and what discarded and put in organics recycling bin

Table: The effect of educational and social influence interventions on the amount of organic waste discarded and on food and non-food organic items put in organics recycling bin

	(1) Number of food items	(2) Number of non-food items	(3) Organic waste (in lbs.)	(4) Compostable liner bags
Education intervention	-0.06	-0.01	0.09	0.06
	(0.16)	(0.17)	(0.51)	(0.10)
Social influence intervention	-0.34**	0.04	-0.11	0.04
	(0.16)	(0.17)	(0.52)	(0.10)
St. Louis Park	0.04	0.15	1.47***	0.19*
	(0.16)	(0.18)	(0.53)	(0.11)
Education × St. Louis Park	0.23	-0.20	-0.79	-0.09
	(0.20)	(0.22)	(0.67)	(0.13)
Social × St. Louis Park	0.40**	-0.34	-0.66	-0.28**
	(0.20)	(0.22)	(0.66)	(0.13)
Observations	2618	2618	2618	2618
R^2	0.123	0.087	0.126	0.112

All regressions include dummy variables for the different weeks.
Standard errors are in parentheses and * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$

Conclusions

- While educational and social influence interventions are effective on increasing the amount of confidence levels of doing organics recycling more appropriately for residential households, the results suggest these interventions would not encourage people to generate more organic waste.
- The results show that social influence intervention was effective for St. Louis Park residents to put more food items out in organics bin while the interventions were not effective to encourage people to put more non-food organic items in organics recycling bin.