Common and Proactive Recycling: Factors Underlying the Recycling Domain of the Climate Change Action Inventory

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Introduction

- Recycling conserves natural resources, saves energy, reduces pollution, combats climate change, and creates healthier environments for people to live in (EPA, n.d.). However, many recyclable products are never recycled, even in the United States where recycling facilities are common, and cities often provide curbside pickup. Moreover, many people are uncertain how to recycle certain items.
- The purpose of this study was to examine the factors underlying the Recycling Domain of the Climate Change Action Inventory (CCAI; Barchard et al., 2021).

Method

Participants

- 500 participants were recruited through CloudResearch.
- 455 participants were left after we removed 30 multivariate outliers and 15 climate change deniers.
  - Ages: 21 to 76 years (M = 39.53, SD = 11.8)
  - Gender: 191 female, 262 male, 2 non-binary
  - Race: 9% Black/African-American, 5% Asian, 83% White/Caucasian, 1% Native American, 0.2% Native Hawaiian or Other Pacific Islander, 2% other

Measures

- Climate Change Action Inventory (CCAI; Barchard et al., 2021) Recycling Domain
  - 11 items measure direct and indirect recycling actions
  - Rated 1 (*less than once a year*), 2 (*once a year*), 3 (*several times a year*), 4 (*once a month*), 5 (*a couple times a month*), 6 (*once a week*), 7 (*at least 3 times a week*), 8 (*at least 7 times a week*), to 9 (*at least 14 times a week*)

Data Analysis

- To determine if all items were related to the same general concept, we extracted the first principal component.
- We calculated the median frequencies of recycling actions and the average frequencies of all salient loadings within the extracted factors.
- To determine the number of factors, we considered the scree test, parallel analysis, and the minimum average partial (MAP) test. Both the MAP test and parallel analysis suggested two factors.
- We examined several orthogonal and oblique rotations. We selected the direct oblimin rotation because it was the closest to the ideal of simple structure.

Results

- All items had salient loadings on the first principal component (see Table 1).
- When two factors were extracted:
  - First factor includes easy household recycling behaviors that can be done on an everyday basis (see Tables 2 and 3).
  - Second factor includes proactive recycling (such as recycling electronics and batteries) and advocacy efforts (such as encouraging others to recycle), actions that are typically done less often (see Tables 2 and 3).
  - These factors had only a modest correlation of .39. Thus, people who engage in common recycling activities do not tend to engage in proactive activities.

People who recycle bottles, cans, and paper might not recycle batteries and electronics

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Discussion

- People who recycle paper also tend to recycle glass and plastic and take the time to rinse their containers. However, people who engage in these common recycling activities do not tend to recycle batteries and electronics.
- Instead, the people recycling batteries and electronics are, on average, the proactive people who advocate for recycling and make donations to recycling organizations.
- Thus, more work should be done on the community-scale to educate the public on how to recycle a wider range of items: Researchers should identify and study communities with more recycling of batteries and electronics, then spread their methods to other communities.

Table 1

First Principal Component

Item	Pattern Matrix Coefficient
Recycling 1	**.84**
Recycling 2	**.85**
Recycling 3	**.85**
Recycling 4	**.85**
Recycling 5	**.87**
Recycling 6	**.85**
Recycling 7	**.68**
Recycling 8	**.64**
Recycling 9	**.70**
Recycling 10	**.63**
Recycling 11	**.52**

Table 2

Factor Analysis of the CCAI Recycling Domain

		Factor		
Item		1	2	h^2
Recycling 2	Recycle plastic bottles	**.98**	-.07	.91
Recycling 5	Recycle tin cans and aluminum cans	**.95**	-.02	.90
Recycling 1	Recycle paper and cardboard	**.94**	-.04	.86
Recycling 3	Recycle glass bottles	**.90**	.04	.84
Recycling 4	Rinse bottles before recycling them	**.86**	.09	.80
Recycling 6	Rinse cans before recycling them	**.85**	.10	.79
Recycling 11	Give time or money to organizations working to improve recycling	-.16	**.92**	.76
Recycling 10	Problem solve how to improve recycling	.00	**.88**	.77
Recycling 8	Recycle electronics (phones, computers, TVs, printers, etc.)	.02	**.86**	.76
Recycling 7	Recycle batteries	.13	**.79**	.71
Recycling 9	Encourage others to recycle	.19	**.74**	.69
	Factor Intercorrelations	1	2	
	Factor 1	1		
	Factor 2	.39	1	

Note. h^2 = communality. Salient factor pattern matrix coefficients are in boldface. Factor 1 = Common Recycling. Factor 2 = Proactive Recycling.

Table 3

Median Frequencies of Recycling Behaviors

Item		Median
Recycling 1	Recycle paper and cardboard	6
Recycling 2	Recycle plastic bottles	6
Recycling 3	Recycle glass bottles	6
Recycling 4	Rinse bottles before recycling them	6
Recycling 5	Recycle tin cans and aluminum cans	6
Recycling 6	Rinse cans before recycling them	6
Recycling 7	Recycle batteries	3
Recycling 8	Recycle electronics (phones, computers, TVs, printers, etc)	2
Recycling 9	Encourage others to recycle	3
Recycling 10	Problem solve how to improve recycling	2
Recycling 11	Give time or money to organizations working to improve recycling	1