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Climate-Friendly Purchasing: An Exploratory Factor Analysis

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INTRODUCTION
- Climate change includes long-term shifts in global temperatures, shrinking ice caps, and rising sea levels.
- Human activities are the main cause of such changes (Lynas et al., 2021)
- Individuals can mitigate the effects of climate change through their purchasing choices (Jakučionytė-Skodienė et al., 2022).
- To understand the strategies people use, we examined the factor structure of the Climate-Friendly Purchasing Choices domain from the Climate Change Action Inventory (CCAI; Barchard et al., 2022).

METHOD
- We recruited 500 Mturk workers using CloudResearch Approved Participants from the United States.
- After 15 climate change deniers were filtered out and 24 outliers removed, we analyzed 461 participants (ages ranged from 19 to 76 years, M = 39.63, SD = 11.81).
- Participants completed the CCAI as part of a larger study, which took 10-15 minutes, for which they were paid $3.
- The CCAI contains 77 items rated on a nine-point scale with the potential scores ranging from 1 (*less than once a year*) to 9 (*at least 14 times a week*). For this study, we focused exclusively on the 14-item Climate-Friendly Purchasing Choices domain and conducted an exploratory factor analysis of its items.
- To determine the number of factors, we used the minimum average partial (MAP) test (Velicer, 1976), scree test (Cattell, 1966), and parallel analysis (Cota et al., 1993; Horn, 1965).
- To select the optimal rotation, we examined three orthogonal rotations (varimax, quartimax, equimax) and three oblique rotations (direct oblimin, promax, Harris-Kaiser) and selected the one that came closest to the ideal of simple structure using the criteria of the hyperplanar count, number of complex items, and the extent of correlation among the factors.
- We extracted three factors and rotated them using a direct oblimin rotation.

RESULTS
- We named the factors Choosing Climate-Friendly Products, Climate-Friendly Purchasing Advocacy, and Renewable Consumerism.
- These three factors had high inter-correlations of .53 and -.59, supporting the idea that they are measuring different aspects of the same construct, as intended.
- See Table 1 for item-factor loadings and factor inter-correlations.

DISCUSSION
- One limitation of the study was that the sample was relatively homogenous.
  - Because the participants resided only in the United States and were mainly white, the findings may not generalize to people of other races or countries.
- Future research should include more racially or regionally diverse samples.
- Nonetheless, this study provides important implications about climate-friendly purchasing choices.
  - Because the three factors were highly correlated, one form of climate-friendly purchasing activism may be associated with other forms.
  - Interventions to change one type of climate-friendly consumer behavior may target people who already engage in other types of consumer behavior.

Climate-friendly purchasing choices include

choosing climate-friendly products,

climate-friendly purchasing advocacy,

and renewable consumerism.

Table 1
Factor Analysis of the Purchasing Domain of the Climate Change Action Inventory

Item		Factor 1	Factor 2	Factor 3
8.	Choose products that have less impact on climate change	**.95**	.00	-.02
6.	Choose products that have less packaging	**.91**	-.04	.01
7.	Choose products that are made locally	**.89**	-.09	.07
11.	Encourage others to choose climate-friendly products	**.56**	**.40**	.05
12.	Problem solve how to reduce the impact of purchases on climate change	**.52**	**.44**	.04
10.	Encourage others to buy less	**.41**	**.44**	.12
14.	Give time or money to organizations working to reduce the impact of purchases on climate change (e.g., environmental regulations, environmental certifications, compostable packaging)	-.01	**.97**	-.02
13.	Give time or money to organizations working to reduce purchases (e.g., bike-share programs, book/music libraries, tool-lending libraries, clothing exchanges)	.02	**.93**	.01
5.	Donate to charity in someone else's name (rather than buying a gift)	-.02	**.78**	.20
2.	Use borrowed, rented, or digital copies of books, music, and movies (rather than buying physical books, CD's, and DVD's)	-.02	-.18	**.90**
4.	Buy used (from consignment stores, thrift stores, garage sales) rather than new	.00	.15	**.76**
1.	Repair things rather than buying replacements	.03	.06	**.76**
3.	Use borrowed or rented tools and equipment (e.g., laptops, skis, dress clothes, musical instruments, pressure washers, carpet cleaners, party tents) rather than buying them	.10	.21	**.62**
9.	Donate or sell your old possessions (rather than throwing them away)	.22	.27	**.46**

Factor Intercorrelations	1	2	3
Factor 1	1	.59	.59
Factor 2		1	.53
Factor 3			1

Note. Salient factor pattern matrix coefficients are in boldface. No items were reverse-scored for this analysis. Factor 1 = Choosing Climate-Friendly Products. Factor 2 = Climate-Friendly Purchasing Advocacy. Factor 3 = Renewable Consumerism.