Climate-Friendly Food Choices and Reducing Food Waste: An Exploratory Factor Analysis

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INTRODUCTION

- The food industry creates a large carbon footprint through the process of food production, harvestation, food processing, and transportation (Food and Agricultural Organization of the United Nations, 2015; Pong, 2020).
- Food wasting behaviors, such as inaccurate food portioning, food mislabeling and mishandling, and misunderstandings surrounding food safety, negatively impact the environment (Block et al., 2022; Evans, 2012; Pilone et al., 2023).
- We utilize the Climate Change Action Inventory (CCAI; Barchard et al., 2021) to explore underlying factors that measure how individuals take action against food wasting behaviors and make climate friendly food choices.

METHOD

Participants

- 500 United States MTurk participants were recruited through CloudResearch's Approved Participant list.
- We filtered out 15 climate change deniers and 16 multivariate outliers, leaving a final sample of 469 participants.
  - Ages: 19 to 76 years (M = 39.72, SD = 11.76).
  - Ethnicities: 83% White/Caucasian, 8% African American/Black, 5% Asian, 1% Native American (North, Central, or South), .2% Native Hawaiian or other Pacific Islander, and 2% other.

Measures

- Climate Change Action Inventory (CCAI; Barchard et al., 2021)
  - Includes 8 domains. We focused on 2.
    - Climate-Friendly Food Choices
    - Reducing Food Waste
  - 9-point frequency scale: 1 *(less than once a year)* to 9 *(at least 14 times a week)*.

Data Analysis

- The MAP test, parallel analysis, and scree plot all indicated two factors.
- Rotations were used to maximize simple and distinct relationships between factors and to achieve clearer structure
  - Simplimax and direct oblimin rotations both fit the ideal of simple structure. We chose simplimax.

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Personal actions to reduce food waste are distinct from food advocacy and problem-solving

RESULTS

- First factor: Items with salient loadings relate to reducing the impact of food consumption on climate change (e.g., donating time and money, choose locally grown food, become vegan/vegetarian). We named this factor Reducing Food Impact.
- Second factor: Items with salient loadings relate to actions that individuals take to reduce the amount of food being wasted (e.g., storing food in sealed containers, cycling old and new food, eating leftovers). We named this factor Reducing Personal Food Waste.

DISCUSSION

- Reducing Waste 8 had a negative loading on Reducing Personal Food Waste.
  - This suggests that one reason people may want to reduce personal food waste is because they are frugal, as frugal behaviors are linked to decreases in food waste (Falasconi et al., 2019; Mohammad & Quoquab, 2024).
- The Reducing Food Waste domain had loadings on both factors:
  - Actions taken to reduce personal food waste are separate from advocacy and problem-solving.
- The two food domains did not form a single factor or create two separate factors. A future revision of the CCAI could consider using different food-related domains.
- Current climate change advocacy and literature focuses on encouraging climate-friendly food choices. Advocacy should also encourage reducing food waste.

Table 1

Factor Analysis of CCAI Climate-Friendly Food Choices and Reducing Food Waste Domains

Item		Factor 1	Factor 2	h^2
Food Choices 5	Problem solve how to reduce the impact of food on climate change	**.91**	-.09	.80
Food Choices 6	Give time or money to organizations working to reduce the impact of food on climate change	**.90**	-.29	.76
Food Choices 4	Encourage others to choose foods that have less impact on climate change	**.88**	-.02	.76
Reducing Waste 8	Give time or money to organizations working to reduce food waste	**.86**	**-.30**	.70
Reducing Waste 7	Problem solve how to reduce food waste	**.78**	.10	.67
Food Choices 2	Choose foods based upon their climate impacts	**.77**	.08	.63
Reducing Waste 6	Encourage others to reduce food waste	**.64**	.27	.57
Food Choices 1	Choose locally grown food (or food you grew yourself)	**.53**	**.34**	.50
Reducing Waste 4	Compost food scraps	**.51**	.18	.34
Food Choices 3	Eat vegan / vegetarian meals	**.50**	.11	.29
Reducing Waste 2	Store leftovers in sealed containers	-.09	**.91**	.79
Reducing Waste 3	Eat leftovers	-.08	**.89**	.76
Reducing Waste 1	Put new foods in the back of your fridge and pantry (so older foods are at the front)	.27	**.56**	.46
Reducing Waste 5	Pack your own lunch (rather than letting someone else do it)	.25	**.47**	.34
	Factor Intercorrelations	1	2	
	Factor 1	1	.26	
	Factor 2		1	

Note. Salient factor pattern matrix coefficients are in boldface. h^2 = communality. Factor 1 = Reducing Food Impact. Factor 2 = Reducing Personal Food Waste.