From Knowledge to Practice: Analyzing Consumer Antecedents of Circular Economy Behaviors

Jinu Jung, Sungkyunkwan University[1]
Seonglim Lee, Sungkyunkwan University[2]

Introduction

Waste management processes—such as transportation, treatment, and disposal—emit greenhouse gases that significantly contribute to climate change (UNEP, 2024). With over two billion tons of waste generated globally each year, projected to rise by 50% by 2050, a shift in resource management is imperative (UNEP, 2024). The circular economy, focused on maximizing resource use and minimizing waste, offers a sustainable approach by increasing recycling and reducing emissions (Hailemariam & Erdiaw-Kwasie, 2023; Pao & Chen, 2022).

However, the success of the circular economy heavily relies on consumer engagement in practices such as using reusable items and sorting waste. Adopting these behaviors is often hindered by barriers such as cost, time, and delayed benefits (Thøgersen, 2023). We examine factors influencing consumer adoption of circular economy practices using the Knowledge-Attitude-Practice (KAP) model, grounded in learning theory (Bandura, 1976) and diffusion of innovation theory (Rogers, 1995). The KAP model posits that knowledge and attitudes are central to shaping behaviors (Liao et al., 2022), with knowledge divided into objective (factual) and subjective (self-assessed) types, each affecting behavior differently (Raju et al., 1995; Ellen, 1994). Moreover, we incorporate the Health Belief Model (HBM) (Rosenstock, 1990) to frame consumer attitudes, as it aligns with the context of environmental actions by capturing dimensions such as perceived severity, susceptibility, benefits, and barriers (Lindsay & Strathman, 1997).

Integrating the KAP model with the HBM framework, we examine the role of both objective and subjective knowledge and various attitudinal factors in influencing consumer practices within the circular economy. It provides foundational insights to guide consumer education and policy efforts that promote sustainable consumption and support climate change mitigation.

Objective

Research on consumer behavior in the circular economy largely examines aspects such as roles, packaging, and purchasing, with limited focus on essential waste disposal behaviors (Vidal-Ayuso et al., 2023). Additionally, existing studies on waste management typically address electronic waste, overlooking everyday practices such as waste sorting and single-use item reduction (Althaf et al., 2019; Glöser-Chahoud et al., 2019). To address these gaps, we investigate the antecedents of consumer engagement in circular economy practices, focusing on daily waste management behaviors.

The specific research questions are:

1. Are objective and subjective knowledge significantly associated with attitudes (perceived severity, susceptibility, benefits, and barriers)?
2. Are attitudes (perceived severity, susceptibility, benefits, and barriers) significantly associated with circular economy practices?
3. Do objective and subjective knowledge influence circular economy practices through attitudes (perceived severity, susceptibility, benefits, and barriers)?

[1] Jinu Jung (hopemom93@skku.edu), Graduate student, Department of Consumer Science and Convergence Program for Social Innovation
[2] Seonglim Lee (clothilda@skku.edu), Professor, Department of Consumer Science and Convergence Program for Social Innovation. Corresponding Author

Method

Data and Sample

Data were obtained from the *Public Attitudes towards the Environment: 2023 Survey*, a nationally representative survey conducted by the Korea Environment Institute (KEI). The sample comprises 3,088 respondents aged 19 to 69, providing a comprehensive view of environmental attitudes and practices.

Variables

- **Dependent Variable**: Circular economy practices were measured as a composite score from five behaviors: avoiding single-use items, sorting waste, and buying recyclable products, with each behavior scored as 1 (engaged) or 0 (not engaged).
- **Mediation Variables**:
  - *Perceived Severity*: Averaged of two items on climate change severity, rated on a 5-point Likert scale (1 = Not at all, 5 = Very much).
  - *Perceived Susceptibility*: Reverse-coded item on the likelihood of climate change affecting the individual, rated on a 6-point Likert scale (1 = Already affected, 6 = Will not be affected).
  - *Perceived Benefits*: Average of three items on beliefs about the environmental impact of pro-environmental actions, rated on a 5-point Likert scale.
  - *Perceived Barriers*: Sum of responses to eight items identifying obstacles to pro-environmental behavior, coded as 1 (Yes) or 0 (No).
- **Independent Variables**:
  - *Objective Knowledge*: Based on ten environmental knowledge items, scored as 1 for correct, -1 for incorrect, and 0 for “don’t know.”
  - *Subjective Knowledge*: Average of responses to three self-assessed knowledge items, rated on a 5-point Likert scale.

Analysis

Regression analyses examined the relationships between circular economy practices, knowledge types, and attitudes. Mediation analyses using the bootstrap method assessed the indirect effects of attitudinal variables.

Results

The analysis showed that objective knowledge was significantly associated with all attitudinal variables, including perceived severity ($b = 0.012$, $p < 0.01$), perceived susceptibility ($b = 0.068$, $p < 0.001$), perceived benefits ($b = 0.015$, $p < 0.01$), and perceived barriers ($b = 0.017$, $p < 0.05$). Subjective knowledge, however, was only significantly associated with perceived severity ($b = 0.174$, $p < 0.001$).

All attitudinal variables—perceived severity ($b = 0.191$, $p < 0.001$), perceived susceptibility ($b = 0.079$, $p < 0.01$), perceived benefits ($b = 0.119$, $p < 0.001$), and perceived barriers ($b = -0.062$, $p < 0.05$)—were significantly linked to circular economy practices, reinforcing attitudes' importance in fostering pro-environmental behavior.

Both objective and subjective knowledge had significant direct and indirect effects on circular economy practices. Objective knowledge demonstrated a direct effect ($b = 0.029$, $p < 0.01$) and indirect effect ($b = 0.008$, $p < 0.001$), while subjective knowledge showed a direct effect ($b = 0.435$, $p < 0.001$) and indirect effect ($b = 0.027$, $p < 0.05$). Notably, subjective knowledge exhibited a stronger direct effect, highlighting its direct role in influencing behavior.

Conclusion

These findings suggest that objective knowledge is broadly associated with attitudinal dimensions—perceived severity, susceptibility, benefits, and barriers—indicating its role in shaping environmental attitudes. Subjective knowledge, while less influential on attitudes, has a stronger impact on circular economy practices, suggesting that consumers' self-assessed understanding is vital for immediate behavioral engagement.

The study underscores that all attitudinal factors significantly predict circular economy practices, affirming the role of perceived severity, susceptibility, benefits, and barriers in fostering pro-environmental behaviors. The dual pathways observed highlight the need to strengthen both objective and subjective knowledge: objective knowledge is essential for forming attitudes, while subjective knowledge drives action.

Policy and educational interventions that promote both knowledge types may therefore be effective in encouraging circular economy practices. This dual approach can contribute to climate change mitigation by fostering sustainable consumer behavior within a circular economy framework. This study offers valuable insights for future research and policy design to support consumer engagement in sustainable practices.

References

Althaf, S., Babbitt, C. W., & Chen, R. (2019). Forecasting electronic waste flows for effective circular economy planning. *Resources, Conservation and Recycling*, 151, 104362.

Ellen, P. S. (1994). Do we know what we need to know? Objective and subjective knowledge effects on pro-ecological behaviors. *Journal of Business Research*, 30(1), 43-52.

Glöser-Chahoud, S., Huster, S., Rosenberg, S., Baazouzi, S., Kiemel, S., Singh, S., ... & Schultmann, F. (2021). Industrial disassembling as a key enabler of circular economy solutions for obsolete electric vehicle battery systems. *Resources, Conservation and Recycling*, 174, 105735.

Hailemariam, A., & Erdiaw-Kwasie, M. O. (2023). Towards a circular economy: Implications for emission reduction and environmental sustainability. *Business Strategy and the Environment*, 32(4), 1951-1965.

Kongarchapatara, B., & Hanpanit, S. (2021). Examining customers' intention to purchase Circular Economy products using Theory of Planned Behavior and moderating effects. *Academy of Strategic Management Journal*, 20(3), 1-11.

Liao, X., Nguyen, T. P. L., & Sasaki, N. (2022). Use of the knowledge, attitude, and practice (KAP) model to examine sustainable agriculture in Thailand. *Regional Sustainability*, 3(1), 41-52.

Pao, H. T., & Chen, C. C. (2022). The dynamic interaction between circular economy and the environment: Evidence on EU countries. *Waste Management & Research*, 40(7), 969-979.

Raju, P. S., Lonial, S. C., & Mangold, W. G. (1995). Differential effects of subjective knowledge, objective knowledge, and usage experience on decision making: An exploratory investigation. *Journal of consumer psychology*, 4(2), 153-180.

Thøgersen, J. (2023). *Concise Introduction to Sustainable Consumption*. Edward Elgar Publishing.

United Nations Environment Programme (2024). *Global Waste Management Outlook 2024: Beyond an age of waste – Turning rubbish into a resource*. Nairobi. https://wedocs.unep.org/20.500.11822/44939

Vidal-Ayuso, F., Akhmedova, A., & Jaca, C. (2023). The circular economy and consumer behaviour: Literature review and research directions. *Journal of Cleaner Production*, 137824.

Yum, J., & Kang, S. (2023).「*Public Attitudes towards the Environment: 2023 Survey*」, Korea Environment Institute (KEI)

Appendix

Table 1. Result of regression analysis

Variables		Perceived severity	Perceived susceptibility	Perceived benefits	Perceived barriers	Circular economy practices
		B(S.E)	B(S.E)	B(S.E)	B(S.E)	B(S.E)
Attitude	Perceived severity					**0.154(0.047)****
	Perceived susceptibility					**0.214(0.036)*****
	Perceived benefits					0.042(0.035)
	Perceived barriers					**-0.060(0.024)***
Knowledge	Objective knowledge	**0.012(0.004)****	**0.062(0.006)*****	**0.015(0.006)****	**0.017(0.008)***	**0.022(0.010)***
	Subjective knowledge	**0.174(0.020)*****	0.008(0.027)	-0.054(0.027)	-0.031(0.037)	**0.434(0.050)*****
Control variables						
Subjective Norm		**0.239(0.017)*****	**0.271(0.024)*****	**0.173(0.024)*****	**-0.123(0.032)****	**0.586(0.044)*****
Gender (Male)						
Female		**0.143(0.021)*****	**0.194(0.029)*****	**0.058(0.029)***	-0.062(0.039)	**0.202(0.053)*****
Age (20s)						
30s		**0.112(0.036)****	**0.119(0.050)***	**0.188(0.051)*****	**0.270(0.069)*****	0.095(0.091)
40s		**0.137(0.038)*****	**0.245(0.053)*****	**0.400(0.053)*****	-0.005(0.073)	0.126(0.097)
50s		**0.130(0.041)****	**0.242(0.056)*****	**0.535(0.057)*****	0.033(0.077)	0.210(0.103)
60s		0.072(0.045)	**0.326(0.062)*****	**0.638(0.063)*****	-0.091(0.085)	**0.438(0.114)*****
Region (Capital)						
Metropolitan		-0.007(0.025)	0.031(0.035)	0.059(0.035)	-0.011(0.048)	-0.052(0.063)
Province		-0.015(0.025)	-0.001(0.034)	0.001(0.034)	**0.107(0.047)***	**-0.167(0.062)****
Income level (Low)						
Middle		-0.029(0.027)	**0.099(0.037)****	0.063(0.037)	-0.046(0.050)	0.003(0.067)
High		-0.015(0.027)	**0.073(0.037)***	0.066(0.037)	**-0.136(0.050)****	-0.034(0.067)
Household size		0.003(0.007)	0.011(0.010)	0.003(0.010)	0.022(0.014)	-0.002(0.018)
Parental Status (No Children)						
With children		-0.022(0.029)	-0.017(0.040)	**0.095(0.041)***	-0.001(0.055)	0.128(0.073)
Education(High school)						
College		0.012(0.023)	**-0.101(0.032)****	**-0.126(0.032)*****	-0.078(0.043)	-0.064(0.058)
Constant		**2.287(0.086)*****	**2.333(0.120)*****	**2.182(0.121)*****	**3.162(0.164)*****	**-1.954(0.264)*****
R^2		**0.13**	**0.13**	**0.13**	**0.03**	**0.20**

*p<.05, **p<.01, ***p<.001

Table 2. Direct effects and indirect effects on circular economy practice

Variables	Direct effects	indirect effects	Total effects
Objective knowledge	**0.029(0.010)****	**0.008(0.002)*****	**0.037(0.010)*****
Subjective knowledge	**0.435(0.050)*****	**0.027(0.012)***	**0.462(0.050)*****

Notes: Based on 5,000 bootstrap samples. *p<.05, **p<.01, ***p<.001