

EFFECTS OF A SMILEY FACE AND SOCIAL NORMS ON STUDENTS' RECYCLING BEHAVIOR AT COLLEGE CAFETERIAS

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ABSTRACT

This study investigates ways to enhance college students' recycling behavior in college cafeterias, focusing on the role of emojis and social norms. A between-subjects field experimental design was conducted, comparing the effects of emoji and non-emoji signage near recycling bins in college cafeterias. Social norms were assessed through a survey, and recycling behavior was observed. The findings, derived from 121 participants, reveal that emoji use positively impacts recycling behavior, particularly when accompanied by a social norm. The implications of these results are discussed from both theoretical and managerial perspectives, offering insights into how to effectively promote recycling behaviors.

Keywords: Emoji Use, Social Norm, Recycling Behavior, College Cafeteria

Acknowledgement: This research was funded by the Foodservice Systems Management Education Council.

INTRODUCTION

Protecting the natural environment has been a historical topic of debate and concern (Schröder et al., 2020). According to the World Bank (2018), waste generation is expected to increase from 2.01 billion tons in 2016 to 3.40 billion tons in 2050. The extensive growth of solid waste and its management is a major concern for many countries (Haj-Salem & Al-Hawari, 2021). To reduce waste, recycling is considered one of the easiest and most accessible ways for individuals to protect the environment (Chao et al., 2021). Engaging in recycling behavior is a pro-environmental practice that demands minimal effort from individuals but yields significant benefits in waste reduction. (Haj-Salem & Al-Hawari, 2021). Recycling behavior not only enhances sustainable business but also mitigates risks to the natural environment (Chao et al., 2021).

Governments have developed various programs to promote recycling behavior, such as implementing multiple recycling services and creating public awareness campaigns. The recycling rate increased from 7% in 1960 (U.S. Census Bureau, 2021) to 32% in 2018 (U.S. Environmental Protection Agency, 2022). However, the rate of recycling behavior is still under 50% among most developed countries (Ayalon et al., 2013).

Individuals' daily behavior is an important factor to lower environmental damage (Panda et al., 2020). Encouraging recycling practices among college students holds significance. In the Fall of 2021, the nationwide enrollment of undergraduate students reached 15.44 million (Hanson, 2024). College students have a reputation for pro-environmental behaviors and attitudes (Levine & Strube, 2012). Their familiarity with environmental issues equips them with a

heightened understanding of effective waste management practices in their day-to-day lives. Zhang et al. (2017), for instance, advocated that university campuses could play a central role in promoting college students' recycling behavior because college students tended to be early adopters and advocates of protecting the environment. According to the Resource Recycling Systems (2021), 63% of the 312 sampled universities in the U.S. have implemented recycling programs on campus. However, the average recycling rate among college students was only 24%. To address this gap between pro-recycling attitudes and actual recycling behavior, it is worthwhile to explore what would be an effective intervention that enhances college students' recycling behavior (Hansen et al., 2008).

One of the effective interventions to attract college students' attention to their recycling behavior can include using emojis. Emojis are pictographs that communicate facial expressions, people, places, or things and they perform as part of the language (McShane, et al., 2021). Emojis are ubiquitous in daily communications (McShane et al., 2021) and the younger generation tends to rely on emojis in their daily communication. Emoji use is supported in the emotion as social information (EASI) theory (Van Kleef, 2009). The EASI theory predicts one's behavioral change due to emotional contagion effects. According to the EASI theory, emojis are viewed as a form of affective signaling (Van Kleef, 2009). Thus, it is predicted when college students are exposed to the recycling bin with emojis, they might be more attentive to the recycling bins, which would eventually enhance their recycling behaviors. Prior research identified the effective use of emojis in promoting recycling behavior. For instance, Baek et al. (2022) identified when the smiley-face emoji was included in assertive X (formerly known as Twitter) messages, people showed stronger behavioral intentions to recycle.

In addition, social norms play an important role in influencing people's pro-environmental behaviors (Chao et al., 2021). A social norm refers to the influence of others on one's behaviors (Ajzen, 1991). The importance of social norms is supported in the Theory of Planned Behavior (Ajzen, 1991). The Theory of Planned Behavior is one of the most extensively used theories in environmental psychology. The theory predicts the psychological components of a recycling behavior, such as a subjective norm (Ceschi et al., 2021). College students' recycling behavior can be observable by others and each college student can see what other peers do with their waste in the cafeteria. Thus, the act of recycling holds the social nature in its behavior. Due to this social nature of recycling behavior, social approval or peer effects becomes important in the recycling behavior (Ceschi et al., 2021). Prior research supports the effects of social norms on recycling behavior. For instance, Sorkun (2018) explained the positive effects of social norm on household recycling behavior in collectivistic societies, such as Turkey. In their study, the influence of social norms on recycling behavior was mediated by perceived convenience. Viscusi et al. (2011) also confirmed the effects of social norms in promoting recycling behaviors.

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Even though promoting college students' recycling behavior is important, prior research lacks an understanding of an effective way to promote college students' recycling behavior. The use of emojis is expected to enhance college students' recycling behavior as supported in prior research (Baek et al., 2022) and the EASI theory (Van Kleef, 2009). In addition, this study proposes the moderating role of social norm on the relationship between emojis and recycling behaviors (Ajzen, 1991), predicting that college students' recycling behavior will be enhanced when peers are present compared to when peers are not present. Based on the prevalence of emoji use in daily communication among college students and the moderating influence of social norms, this study aims to answer the following research questions.

Research question 1: What are the effects of emoji use on college students' recycling behaviors?

Research question 2: What are the effects of social norms on the relationship between emoji use and college students' recycling behaviors?

METHODS

Study Design

A between-subjects experimental design was used to investigate the effects of emoji use and social norms on college students' recycling behaviors. Signage indicating "RECYCLE" on a plain white background was posted on dominant area above a recycling bin for a no emoji condition. Signage indicating "RECYCLE" and a smiley face was used for an emoji condition. The recycling bin has a campus-wide instructions attached, encouraging individuals to recycle clean and dry plastic bottles and jugs, paper and newspaper, cardboard, aluminum and steel cans, and glass bottles. The stimulus used in the experiment is represented in Figure 1. The experiment was conducted at two campus cafeterias. At each cafeteria, the condition of no emoji and emoji was implemented for four days (Monday-Thursday), respectively between 11 am – 2 pm during November and December 2022 (Table 1).

Researchers observed how customers discarded meal items completely into the garbage bin or discarded single-use items (e.g., plastic forks) separately in a recycling bin. Each individual's recycling behavior was recorded as either yes, if single-use items were discarded into a recycling bin, or no, if all items were discarded into regular trash bins. Each person was assigned a random code for matching with their survey responses. Following the observations, each individual was approached by researchers to solicit their participation in the online survey. Those who consented to participate in the survey were given a QR code that directed them to the survey and a random code which they entered into the survey to be matched



No Emoji condition: Signage indicating "RECYCLE" on a plain white background was posted.	Emoji condition: Signage indicating "RECYCLE" and a smiley face was posted.
	

Figure 1. Stimulus used in the experiment.

Table 1. Implementation of the Emoji Intervention at College Cafeterias.

Cafeteria	Week 1	Week 2	Week 3	Week 4
A	No emoji ^a	Emoji ^b		
B			No emoji ^a	Emoji ^b

^a Signage indicating "RECYCLE" on a plain white background was posted on dominant areas above recycling bins.

^b Signage indicating "RECYCLE" and a smiley face was posted on dominant areas above recycling bins.

with their recycling behavior. The manually recorded recycling behavior was entered for each individual by the random code before data analysis. Once the survey was completed, participants received a password and submitted it to researchers to receive a \$5.00 gift card.

Survey

The survey included three sections. The first section provided an informed consent form and explained the purpose of this study and participants' rights.

The second section included questions about environmental concerns and social norms. Environmental concern might interfere with the main effect of emoji use on recycling behavior, thus was measured to be controlled during data analysis. The participants' environmental concern was measured by five items (Chao et al., 2021) based on a 7-point Likert scale, "1" being "strongly disagree" and "7" being "strongly agree." Example items are "I think it is important to protect and improve wildlife habitat" and "I think it is important to contribute to the wellbeing of the environment." The Cronbach's alpha of 0.952 confirmed reliability of the five items (Nunnally & Bernstein, 1994). Social norms was measured by one item, "were you with someone else when you used trash bins?" It is acceptable to measure a construct with one item if the situation is straightforward (Bergkvist & Rossiter, 2007).

The last section asked about participants' age, gender, and ethnicity. Also, participant's status of student, faculty, staff or other was asked to screen out non-student participants. This study was approved by the Institutional Review Board at a large Midwestern state university.

Data Analysis

A total of 131 people participated in the survey and their recycling behaviors were observed. After removing three incomplete and seven non-student (e.g., faculty or staff) responses, 121 responses were used for data analysis. The effect of emoji use (no emoji condition versus emoji condition) on students' recycling behavior (recycled or not) was analyzed by a chi-square analysis. The effect of social norms (present versus not present) on the relationship between emoji use and recycling behavior was tested by a chi-square analysis and a logistic regression analysis.

RESULTS AND DISCUSSION

Among 121 participants, 78% were female, 16% were male, and 6% were non-binary/third gender or preferred not to disclose gender. The majority (93%) were between 18-24 years old, followed by 25-34 years old (7%). Almost 84% were Caucasian and the rest were composed of Asian (5%), African American (5%), and other.

A chi-square analysis showed a significant effect of emoji use on recycling behavior ($\chi^2(1, N=121) = 5.53, p=0.019$; Table 2). Students recycled more when they saw the smiley face (emoji use) above a recycling bin compared to those who saw only the text of RECYCLE. It implies that the emoji use in addition to traditional text promotions

Table 2. The Effect of Emoji Use on Recycling Behavior.

Recycling behavior	n (%)			$\chi^2(1, N=121) = 5.53$ $p=0.019$
	No Emoji ^a	Emoji ^b	Total	
Not Recycled	49 (79.0)	35 (59.3)	84 (69.4)	
Recycled	13 (21.0)	24 (40.7)	37 (30.6)	

^a Signage indicating “RECYCLE” on a plain white background was posted on dominant areas above recycling bins.

^b Signage indicating “RECYCLE” and a smiley face was posted on dominant areas above recycling bins.

attracted students’ attention and encouraged them to recycle more actively. Emoji use has been studied in various contexts and research fields, ranging from education to marketing (Bai et al., 2019). The visual features of emoji helped students better learn concepts even with language barriers and facilitated effective communication in online courses (Brody & Caldwell, 2019). In marketing activities, emoji attracted potential consumer’s attention, enhanced positive purchasing experiences, and improved future purchase intention (Das et al., 2019). This study supports other findings of positive impact of emoji use and the impact on recycling behavior (Baek et al., 2022). Emoji use has been studied extensively in computer mediated communication because it makes up for the lack of expressions in the unique communication setting. With that, it was especially meaningful to confirm the emoji impact on recycling behavior in a real life setting as the previous study (Baek et al., 2022) proved it in digital platforms. This study took place in naturally occurring social settings, thus it has better external validity.

Further analyses revealed that the effect of emojis were apparent only when students were with someone else (Table 3). Specifically, when students were with someone else, significantly more students recycled in the emoji condition, $\chi^2(1, N=76) = 8.769, p=0.003$. However, when students were alone, no significant difference in recycling behavior was found between no emoji and emoji conditions, $\chi^2(1, N=45) = 0.002, p=0.965$.

To confirm the effect of social norms, we used a logistic regression analysis with emoji use (no emoji vs. emoji), social norms identified from the survey (not present vs. present), and their interaction. Environmental concerns were included as a control variable but did not have a significant impact on recycling behavior. The interaction term was marginally significant at p value of 0.056. The condition of no emoji and existence of social norms was significantly different from the reference condition of no emoji and no existence of social norms ($\beta = -1.648$, odds ratio = 0.192, $p = 0.006$). Other conditions (emoji with/without social norms) were not significantly different from the reference condition. In sum, a pivotal determinant of college students’ recycling behavior was the presence of another individual at the time of utilizing trash bins. Notably, the emoji itself did not exert any discernible influence.

The strong effect of social norms on students’ recycling behavior is consistent with previous findings that social norms influence pro-environmental behavior (Farrow et al., 2017). Social norm interventions reduced energy consumption by almost 2% (Costa & Kahn, 2013), encouraged college students to turn off lights in a public restroom (Oceja & Berenguer, 2009), and increased intention to recycle (Fornara et al., 2011). People tend to take actions that are approved and expected by others in general. Younger generations, including college students, are known for being active in protecting the environment. Gen Z is willing to purchase sustainable brands, and pay more on sustainably produced items (Petro, 2021). Gen Z and Millennials actively discuss climate change and the need for action, seeing and engaging on social media with relevant contents (Tyson et al., 2021). Ironically, their recycling behavior is not aligned well with these notions, as the average recycling rate of college students was found to be 24% (Resource Recycling Systems, 2021). The results of this study suggests that colleges utilize social norms to encourage college students to be actively engaged in recycling behavior on campus.

IMPLICATIONS AND CONCLUSION

Theoretical and industry implications

One of the most extensively used techniques to protect the environment is the three Rs- reduce, reuse, and recycle resources. Derived from the importance of recycling, this study explored how to promote college students’ recycling behavior. While previous research investigated factors influencing college students’ intrinsic and extrinsic recycling motivations (Chao et al., 2021), it underexplored strategies to promote such behavior. This study focused on the intervention of using emojis and extended the applicability of their use, derived from EASI theory. Emojis, prevalently used in digital communications, have shown positive effects on customer engagement (Wang et al., 2023) and purchase intention (Das et al., 2019). Building on this, our study extends the role of emojis in promoting pro-environmental behavior, particularly, recycling. Furthermore, our research revealed that the impact of emoji use is contingent upon the existence of social norms. In the absence of such norms, emoji use alone does not exert a significant influence. This study contributed to the importance of social norms in encouraging pro-environmental behaviors. Consistent with the

Table 3. The Different Effects of Emoji Use on Recycling Behavior by Social Norms.

Recycling behavior	Students without social norms			$\chi^2(1, N=45) = 0.002$ $p=0.965$
	No Emoji ^a	Emoji ^b	Total	
Not Recycled	17 (70.8)	15 (71.4)	32 (71.1)	
Recycled	7 (29.2)	6 (28.6)	13 (28.9)	
Recycling behavior	Students with social norms			$\chi^2(1, N=76) = 8.769$ $p=0.003$
	No Emoji ^a	Emoji ^b	Total	
Not Recycled	32 (84.2)	20 (52.6)	52 (68.4)	
Recycled	6 (15.8)	18 (47.4)	24 (31.6)	

^a Signage indicating “RECYCLE” on a plain white background was posted on dominant areas above recycling bins.

^b Signage indicating “RECYCLE” and a smiley face was posted on dominant areas above recycling bins.

significant role of social norms in pro-environmental behaviors (Thoo et al., 2022), this study identified the positive influence of social norms in college students' recycling behavior in the college cafeteria.

Practical industry implications include adapting incorporating simple, attention-grabbing cues, like emojis, near recycling bins. People unconsciously discard their trash into the trash bins. Exposure to the emoji can transform people's behavior from discarding everything into the trash can to engaging in recycling behavior. More broadly, the finding of effective emoji use could be applied in health communication. Using visual appeals in message-based health interventions was found to promote attitude and behavioral intention (Niu et al., 2020). Emojis are universally recognized visual symbols irrespective of the context, thus can be more readily employed than content-based visuals in various health interventions. Adding a smiley face next to calorie labels on menus would positively influence people's food selections. It is crucial to highlight that within the college cafeteria setting, leveraging tools that tap into social norms becomes imperative, as the mere presence of emojis alone may not yield substantial influence. Consideration could be given to placing recycling bins strategically in open, public areas rather than isolating them. Additionally, incorporating messages that evoke and reinforce social norms may prove to be beneficial in encouraging college students' recycling behavior. For example, it is advisable to use a majority message (e.g., "70% of college students advocate recycling") that captures attention through visually appealing designs. The message should be clear and simple, accompanied by credible sources (National Social Norms Center, n.d.).

Limitations and suggestions for future research

While this study provides useful implications, there are limitations. It was conducted in the college cafeterias to explore college students' recycling behavior and is, therefore, not ideal for generalizing recycling behavior overall. The proposed relationships can be applied to other foodservice domains contexts to increase the generalizability of the results.

This study explored the presence versus absence of emoji use and social norm on college students' recycling behaviors. Subsequent research could delve into additional facets of emoji use, such as the valence of emojis, to understand how different types may influence recycling behavior. Furthermore, exploring someone else's recycling behavior or relationship type could provide further insights.

This study did not examine potential differences between participants and non-participants. It's possible that individuals who recycled are more inclined to participate in the survey. While people might not be aware of the survey's focus before taking part, it would be beneficial to compare recycling behaviors between those who participated and those who did not. In addition, examining gender effects could be interesting, given that our study predominantly involved female students. Women tend to recycle more, support environmental regulations, possess greater knowledge of the scientific aspects of climate change, and express more concern about its effects (Somerville, 2018). This is often attributed to the perception among men that environmental behavior is feminine (Brough et al., 2016). Assessing the gender effect in various aspects, including the comparison between participants and non-participants, could offer deeper insights into understanding recycling behavior.

This study explored only recycling behaviors. Future research can explore various pro-environmental behaviors to investigate the impact of emoji use across different contexts. For instance, exploring the role of emojis in shaping college students' food waste reduction

behaviors, given that food waste in college cafeterias often signals issues to foodservice operations (Stein, 2021), would be a valuable avenue for future research.

It's important to note that this study specifically focused on the effects of emojis and social norms on actual recycling behaviors at on-campus cafeterias. However, it did not uncover the underlying mechanisms explaining why students exhibited these behaviors. The findings from this study prompt researchers to explore the potential mediators in the relationships between emojis, social norms, and recycling behavior. Investigating whether emojis trigger psychological reactions beyond simply capturing attention would be particularly interesting.

We should not take this planet for granted. Emphasizing the promotion of pro-environmental behavior, this study identified that social norms and a simple sign, such as emoji use, can serve as a persuasive cue to promote college students' recycling behaviors. Building upon this research, more research should be conducted to explore effective ways to promote recycling behavior with the aim of lowering the environmental harm to our precious planet.

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