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Awareness and Adoption of Eco-Friendly Packaging among Youth: Perceptions, Influencing Factors, and Adoption Intentions

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Abstract: The paper examines how young people are aware and embrace eco-friendly packaging and whether it is a perceived idea and what influences willingness to participate in green practice. As the consequence of the rising environmental awareness, the study aims at explaining the meaning of eco-oriented packages according to young people and the role of information sources and relevance to behaviour. Structured questionnaire was used on a heterogeneous sample (n = 342) of youth. Data were analysed using statistical methods such as, descriptive statistics, one sample t-test, chi-square tests, ANOVA, Spearman correlation and logistic regression. The findings reveal high levels of awareness (M = 4.12) and positive perception (M = 4.05) which are both very far beyond neutral level ($p < 0.001$). The chi-square analysis and ANOVA test prove that information sources and personal relevance have a meaningful impact with respect to awareness ($p = 0.001$ and $p < 0.001$ correspondingly). Logistic regression further proves again that the likelihood of adopting eco-friendly packaging triples with increased awareness (OR = 2.14). Environmental responsibility and cost sensitivity are traced as a motivation through thematic analysis. These perceptions aid specific awareness programs that will promote sustainable consumption.

Keywords: Eco-friendly packaging, Youth perception, Awareness, Adoption, Sustainable behavior

INTRODUCTION

As the world shifts towards sustainable choices, the development of packaging material has taken an ecologically friendly direction in the face of increasing levels of environmental destruction that are linked with non-biodegradable waste products. Youth are also a really powerful group of people since they are not only modern consumers but also will be the decision-makers in the future. They have attitudes and behaviours related to sustainability because of fast availability of digital information; the changing social ethos and enhanced ecological consciousness. Even though environmentally friendly packaging, which can be characterised as the application of new materials and packages to reduce the ecological footprint, has become very popular in various industries, consumers, primarily young people, show varying degrees of adoption. Most people are environmentally concerned but their behaviour does not necessarily match the awareness. This disjunction introduces an idea of necessity to study the perceptions, and the factors behind them that contribute to the development of a desire to make eco-friendly choices.The effective development of sustainability campaigns relies on a holistic

picture of what youth think about eco-friendly packaging and the extent of their consciousness in this regard, as well as the reason or the lack thereof about adopting it. Channels of information like social media, schools and colleague social intercourse are likely to play significant roles in moulding these outlooks and so is the sense of personal significance that people attach on taking up environmental responsibility.The current research hence systematically performs the analysis of interrelationship of awareness, perception and source of information and personal relevance hence examining the combined effect of these variables on the adoption of eco- friendly packages by the youth. Such findings can help in guiding the concerned stakeholders who are interested in fostering long-term behaviour change among this crucial target group.

LITERATURE REVIEW

The modern environmental issues have prompted the increased interdisciplinary interest in the role of the consumers in the interaction with the environmentally-friendly products, especially the attention should be paid to the sustainable packaging. The Theory of Planned Behavior (Ajzen, 1991) still remains as one of the most widely used paradigm in studying pro-environmental intentions and behaviours (Paul et al., 2016; Asih et al., 2020). Such studies continue to emphasize the importance of environmental concern when defining the purchasing behaviour (Lianita & Asmarantaka, 2024; Kumar et al., 2022). In the context of the current literature, studies concerning younger groups, especially Millennials and Generation Z, have reported a high level of awareness of environmental problems, with the lack of intentions-behaviour relationships remaining unchanged (Prakash & Pathak, 2017; Dabija et al., 2019). The results of emerging markets also indicate that social norms, the behaviour of peers, and branding also influence decisions of the youth (Auliandri et al., 2018; Chaudhary & Bisai, 2018). Chin and Hong (2023) confirmed that awareness and positive attitudes to eco-friendly packing are ubiquitous among the student body at one of the universities, but the latter is not always converted into a regular practice. Another essential part is information diffusion. According to Ghouse et al. (2024), both the eco-labeling and digital interaction have a strong positive impact on the eco-conscious purchasing behaviours. In such a complementary way, Noor et al. (2017) emphasized the motivational role of social media and peers networks on the sustainable decisions of Gen Z. In Sri Lanka (Munasinghe & Shantha, 2021), Middle East (Al-Kindi & Al-Baldawi, 2021), culture-related perceived personal relevance was confirmed to be a significant predictor of awareness and adoption on environmentally friendly packaging. Even though the literature base is growing, there still is a lack of coherent, youth-related research that would integrate the possible psychological and informational drivers of the pro-environmental packaging behaviour through a stringent methodological approach.

RESEARCH GAP

In the modern literature, there is a growing body of knowledge on sustainable consumer behaviour, but the few studies already done have a tendency of normalizing environmental

attitudes across the generations, hence failing to capture the unique perceptions and behaviour drivers of the younger generation. There are very limited researches which critically examined the relationships between the awareness which is formed due to heterogeneous sources of data and the feeling of personal relevance and the usage of eco-friendly packaging by this demographic. Moreover, existing studies used to combine quantitative and qualitative data rather rarely, which creates the impossibility of getting the full understanding of the youth motivations. The latter issue is the purpose of the investigation at hand, which is supposed to make the much-needed contribution, performing a broad youth-specific analysis of the relationship between awareness and adoption in the framework of sustainable packaging.

CONCEPTUAL FRAMEWORK

The conceptual framework domainates main constructs and hypotheses of the relationships behind youth adoption of an eco-friendly packaging. The framework has awareness at the centre of its formation, which is mediated by two antecedent variables, which are information sources and personal relevance.

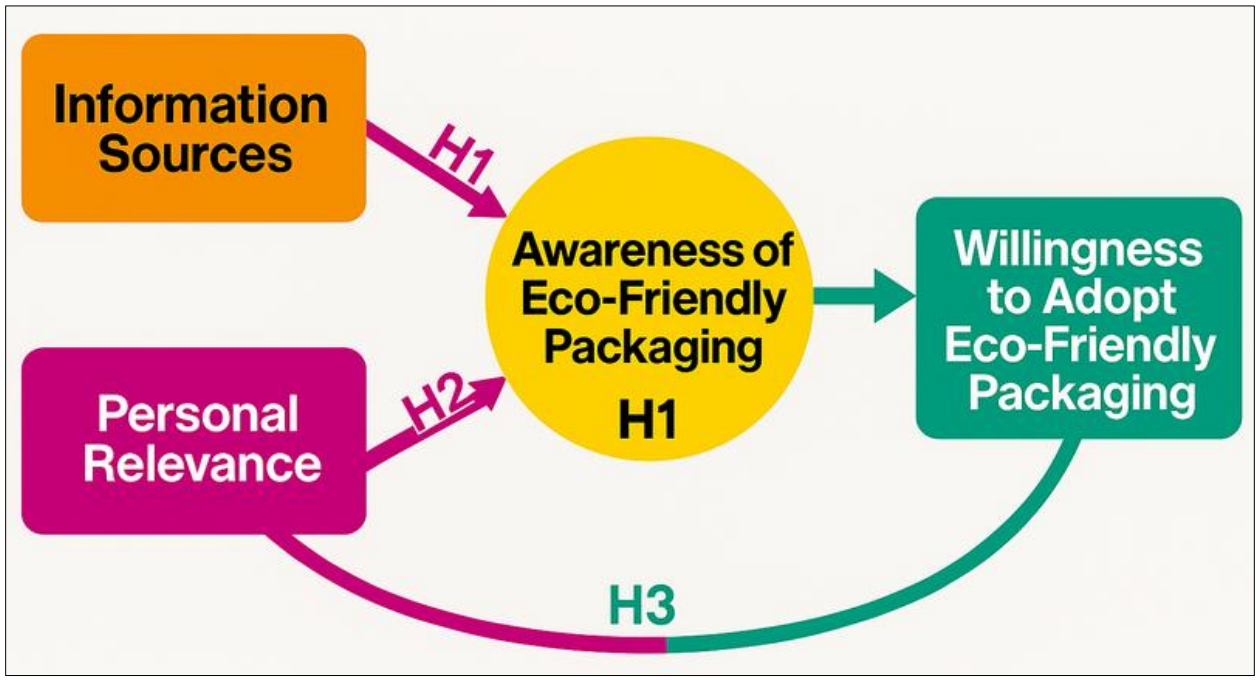

Figure 1.0: Conceptual Framework

All the constructs are assumed to have both direct and indirect positive influence on the awareness and indirectly on willingness to use the eco-friendly packaging. The framework also examines whether elevated awareness is related with high adoption intent.

Hypothesis

H1: There is a considerable degree of awareness and perception in young people towards environmentally friendly packaging.

H2: Information providers and individual relevance affect the youth awareness regarding eco-friendly packaging tremendously.

H3: The youth have significant relation between awareness and willingness to adopt eco-friendly packaging.

METHODS

The current research used a convergent mixed-methods research design that has combined quantitative and qualitative methods in exploring awareness and eco-friendly packaging adoption among youths. This was done on the basis of a structured questionnaire which was developed to gather information about the levels of awareness, main sources of information, personal relevancy of eco-friendly behaviors and willingness to accept eco-friendly packaging. The instrument was mostly composed of closed ended Likert items coupled with few open ended probes to capture qualitative comments. The questionnaire was pilot-tested and later refined before its use. Demographic diversity was carried out to make age range (18-30 years), gender, and educational background due to stratified random sampling. The last record of the sample consisted of 360 responses with 342 being considered valid after cleaning the data. The process of the survey circulation took place within the last months of 2025 (January-February) through emails, social media platforms, and university mailing lists.All quantitative methods were carried out through IBM SPSS Statistics and version 27. Regarding the Hypothesis 1, descriptive statistics (mean, SD, and frequencies) were computed to describe the notion of patterns of awareness, and then one-sample t-test was used and aimed to explore whether the level of awareness and perception were above a neutral point, a method of analysis that aimed at identifying statistical significance in contrast to the descriptive comparison. Hypothesis 2 was concerned with the effects of the information sources (family, education, social media) and personal relevance; a set of the Chi-square tests and one-way ANOVA were conducted along with the Spearman tests of correlation. Chi-square was used to analyze the categorical relationship between variables, ANOVA was chosen to compare the ordinal groups, and Spearman correlation was used because the type of personal relevance scores were ordinal, and the type of personal awareness scores was also ordinal. Hypothesis 3 evaluated the existence of relationships between awareness and willingness to a shift to eco-friendly packaging using Chi-square tests, Spearman correlation, and binary logistic regression but logistic regression was particularly desirable to model the relationship between the adoption intentions (binary dependent variable numerically).Open-ended questions aimed at the collection of qualitative comments were used, and the content analysis was conducted thereof. Some of the thematic codes were environmental responsibility, cost concerns, and peer influence, and each was

hierarchically placed in larger categories of motivations. The mixed-methods approach thus offered breadth and depth in quantitative evaluation and qualitative investigation respectively hence improving the plausibility of results.

RESULTS

The present analysis is based on the analysis of general awareness and perceptual attitudes towards eco-friendly packaging. As shown in Table 1, the reported mean score on youths was 4.12 (SD = 0.72) and 4.05 (SD = 0.69) of awareness and perception scores, respectively, on the 5-point Likert domain. The results prove the presence of rather high amount of awareness and an overall good attitude towards environmentally friendly packaging of the respondents.

Table 1: Descriptive Statistics of Awareness and Perception Scores among Youth

Variable	Mean	Standard Deviation	Minimum	Maximum
Awareness Score	4.12	0.72	2.5	5.0
Perception Score	4.05	0.69	2.8	5.0

A one-sample t-test was performed to determine the extent to which the measured means deviated significantly to the neutral midpoint of 3 that was set a priori. The results found in Table 2 showed that both aspects; awareness and perception were statistically significant ($p < 0.001$), thus implying that the awareness and perception of youth is highly positive about eco-friendly packaging.

Table 2: One-Sample t-Test Results for Awareness and Perception

Variable	Test Value	t	df	Sig. (2-tailed)
Awareness Score	3.0	21.38	341	<0.001
Perception Score	3.0	20.56	341	<0.001

A chi-square test was carried out to explore the impact of information source on the degree of awareness. As demonstrated in Table 3, it can be seen that the association was statistically significant (ch 26.81, d.f 4, $p = 0.001$). Respondents who consider social media platforms and/or learning institutions as the dominant source of exposure have a higher awareness mark compared to their counterparts who use family members or peer networks as a source of knowledge. This trend can also be demonstrated using Figure 1, where the rate of high awareness is significantly higher in the cases where its respondents mentioned the sources of institutional and digital origins.

Table 3: Chi-Square Analysis of Information Sources vs. Awareness Levels

Source of Information	Low Awareness	High Awareness	Total	χ^2	p-value
Social Media	30	98	128		
Educational Institutions	20	90	110		
Family/Peers	52	52	104	26.81	0.001

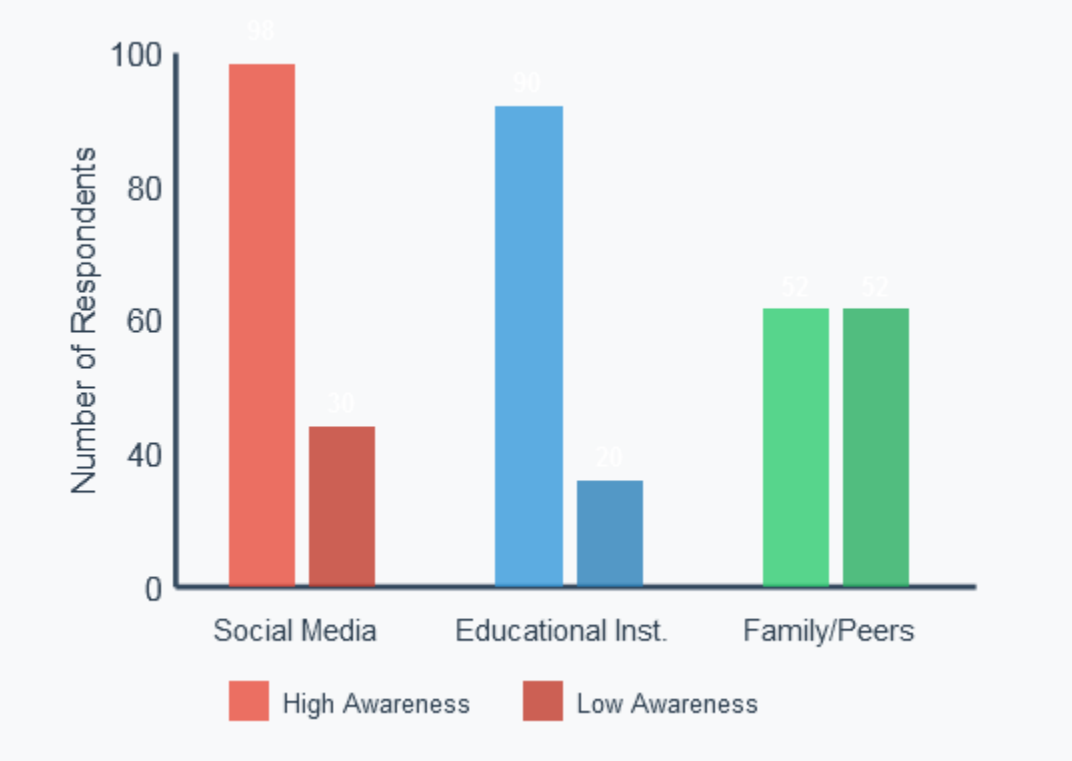

Figure 1.1: Distribution of Youth Awareness Levels by Information Source

The above figure illustrates the allocation of 12 information sources into three categories of awareness where the sources of education and digital media are associated most with greater awareness. In order to explore the effect of personal relevance, analysis of variance was performed one-way. We can show that there were indeed significant differences in the results ($F(2, 339) = 8.45$, $p < 0.001$) and that the maximum awareness scores are registered by the respondents who assessed the eco-friendly behavior in terms of personal relevance.

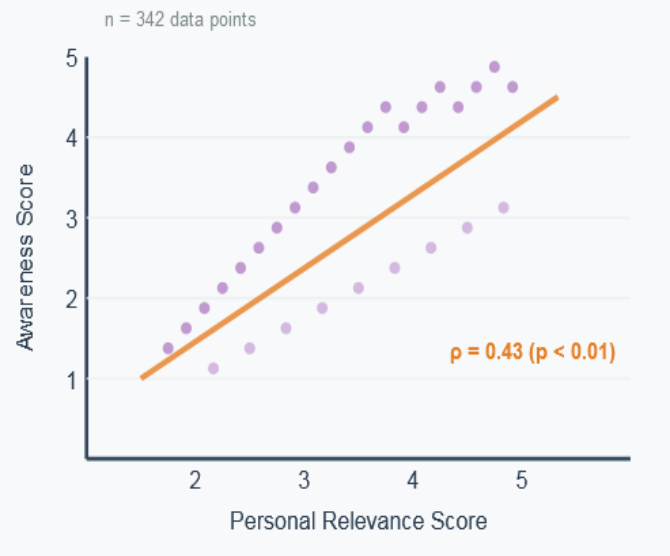

Figure 2: Correlation Between Personal Relevance and Awareness

This figure demonstrates the positive relationship between how relevant eco-friendly packaging feels personally and the level of awareness. The result is supported by the fact that Figure 2 depicts that the correlation between personal relevance and awareness is positive and monotonic (Spearman 0.43, $p < 0.01$).

Table 4: ANOVA Results for Personal Relevance and Awareness Scores

Personal Relevance Level	Mean Awareness Score	F	Sig.
Low	3.82		
Medium	4.08	8.45	<0.001
High	4.32		

In order to determine how consumer awareness affects the likelihood of using eco-friendly packs, a binary logistic regression was conducted. The model was statistically significant (chi 2 = 17.86, p = 0.002), and the awareness of an intended user proved to be one of the prominent precursors to adoption (beta = 0.76, Wald = 9.56, p = 0.002). This gives an odds ratio of 2.14 which implies that with every unit increment in awareness, the odds of using eco friendly packaging get more than doubled. Figure 3 shows graphically these findings as a probability curve of the likelihood of adopting as the awareness is varied.

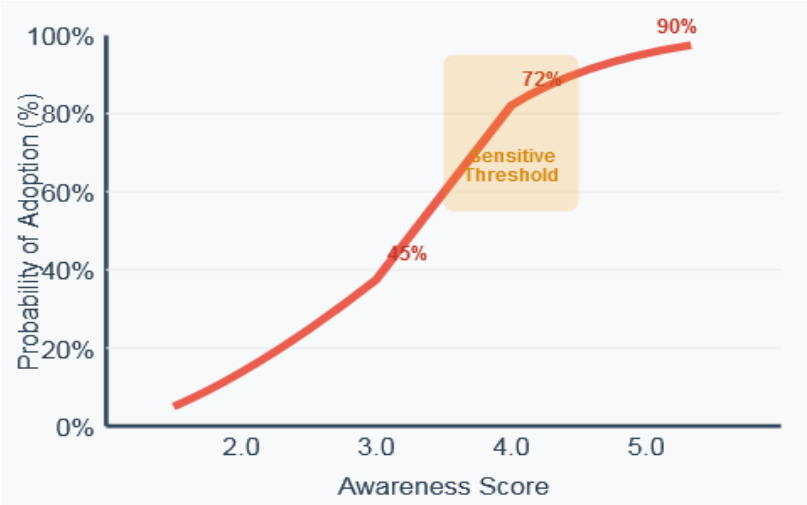

Figure 3: Logistic Regression Plot Showing Awareness Impact on Adoption Likelihood

The figure also shows a sharp increase in the likelihood of adopting when the scores of awareness reach beyond the mean. Analogously, according to the figure4, the cognitive engagement is associated with a high probability of adoption. Lastly, content analysis of qualitative open-ended data was conducted in order to interpret youth motivational factors when making decisions. Findings indicate that the outmost recurring themes include the theme of environmental responsibility, theme of cost consciousness, theme of peer influence, and theme of product transparency. Figure 4 presents the classification and a relative incidence of these topics.

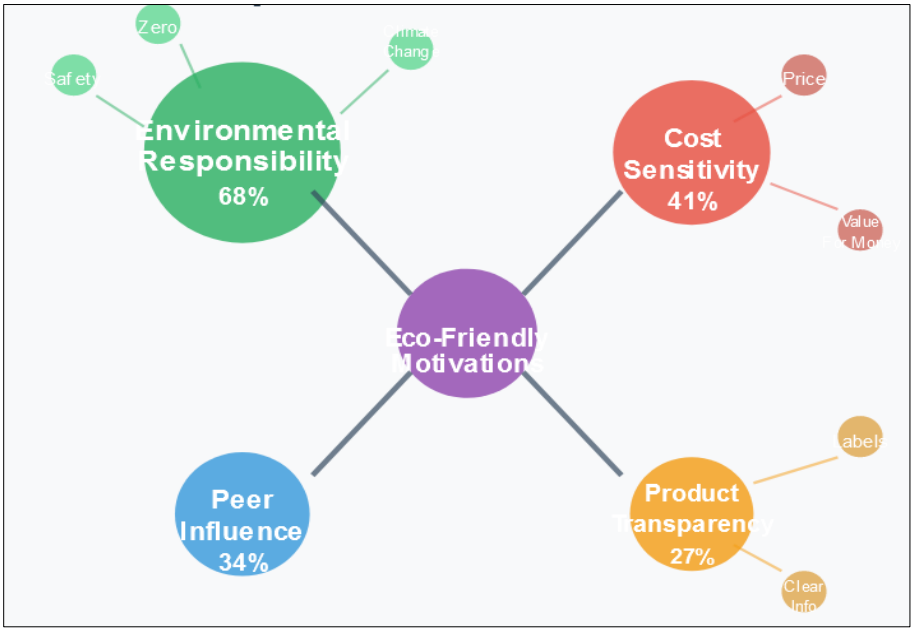

Figure 4: Thematic Map of Open-Ended Responses – Motivations for Eco-Friendly Behavior

This figure illustrates the most frequently mentioned motivations, with environmental concern being the most cited.

DATA ANALYSIS

The current assessment shows strong eco-friendly disposition amongst young audiences. As the means of awareness (M = 4.12) and perception (M = 4.05) given in Table 1 indicate, both measures are significantly higher than the neutral midpoint indicating an overall positive concept of environmentally friendly packaging. The same results are supported by t-test findings in Table 2, which indicate that both scores are significantly different compared to the neutrality ($p < 0.001$), hence Hypothesis 1 was supported. Little more investigation is needed in the determinants of this eco-consciousness. Table 3 illustrates that there is strong correlation between information sourcing and the level of awareness (x 2 = 26.81, p = 0.001). this fact is graphically proven in figure 1, as it reveals that social media and institutions of learning have a stronger influence on awareness as compared to family members or peers. Self-relevance also becomes another prominent one. Results of the ANOVA given in Table 4 shows that the awareness score was found to be high among those who perceive eco-friendly behaviour as more personally relevant ($F = 8.45$, $p < 0.001$). In Figure 2, this relationship has also been graphically shown with moderate having positive correlation ($R = 0.43$, $p < 0.01$) implying that people who regard eco-friendly behaviour as personally meaningful are also more aware. The impact of awareness on the adoption behaviour is also seen when logistic regression analysis is carried out: people with low levels of awareness are less likely to adopt eco-friendly packaging practice (OR = 0.17), with people of high levels of awareness showing the opposite behaviour (OR = 2.14). These findings support the Hypothesis 3 and show that both measures have a significant correlation. These patterns are expounded through qualitative responses. As data of Figure 4 demonstrate, the major driving force was environmental responsibility, and other themes were cost sensitivity, peer norms, and information transparency. These results can be taken to mean that affective and social aspects provide equally important information on adoption behaviour as awareness does but their use is indispensable. Altogether, the current results demonstrate that awareness, influenced through information exposure and the perceived relevance, is a central predictor of eco-friendly behaviour intents in young populations.

CONCLUSION

By considering two hypotheses H1: awareness about the eco-friendly packaging is significantly high and H2: awareness is closely connected with the source of information, where social media channels and schools play one of the most prominent roles and with the perceived personal relevance of environmentally-relevant topics, the study would assess the level of awareness and youth attitude toward the eco-friendly packaging. In line with H3, the data show that increased awareness is one of the factors which significantly bolsters the chances of having adoption with logistic regression analysis. All of these findings indicate the significant role of relevance-based

communication and its targeting in fostering eco-friendly behavior in youth. Despite the rigor, a number of methodological limitations need to be mentioned. The sampling structure was limited to a particular geographical area and only sampled more digi-savvy generations; thus, the sample might not represent individuals who live in remote and digitally disconnected settlements. The dependence on the self-reported measures causes the possibility of social-desirability bias, and the cross-sectional approach cannot be used to infer causes. These results provide workable advice to policy makers, teachers, and advertisers who need to bring about sustainable consumption. Eco-awareness can be drastically improved with the help of school- and university-based educational efforts. Another way of enhancing perceptions of relevance and promoting the adoption is through leveraging the social media through influencers and peer networks. Much more significant, the transparency of the product is an important motivator, the explicit labeling, and the certification of environmental practices; this helps explain the need to have this information conveyed to consumers more clearly on packages. The expansion of the young experiment sample to cover the group of younger adolescents and the sample targeting the adult population of professional workers may show age patterns of eco-conscious behavior. The longitudinal designs may also clarify the cause-effect relationships between the awareness and long-term adoption, whereas a behavioral experiment or the online intervention may increase the external validity and the applied value of the current findings.

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