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MORALITY BEFORE KNOWLEDGE

# Optimizing sustainable consumption: Understanding reusable lunch box usage intentions through the theory of planned behavior

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## ABSTRACT

**Background:** The shift from using single use to reusable lunch boxes presents a challenge for college students. The economic circular framework is now applied not only to industrial processes but also to consumption behavior. This study aims to examine how the Theory of Planned Behavior (TPB) model, including attitude, subjective norms, perceived behavioral control, moral norms, descriptive norms, and self-identity, influences the intention to use reusable lunch boxes. **Method:** The study involved 110 undergraduate students from a college campus in Denpasar City. Participants completed questionnaires distributed using a snowball sampling technique. Data analysis was conducted using Partial Least Squares Structural Equation Modeling (PLS-SEM). **Findings:** The study found that perceived behavioral control and self-identity significantly affect the intention to use reusable lunch boxes. The R-square analysis indicated that 31.1% of students' intention to use reusable lunch boxes was influenced by subjective norms, while 26.4% was influenced by self-identity. **Conclusion:** The study concludes that perceived behavioral control and self-identity play key roles in students' intention to use reusable lunch boxes. Future research should focus on making reusable lunch boxes more convenient and integrating them into a system that encourages behavior change on college campuses. **Novelty/Originality of this article:** This study applies the Theory of Planned Behavior to understand college students' intentions to adopt reusable lunch boxes, offering valuable insights for promoting sustainable consumption behavior in a campus setting.

**KEYWORDS:** theory of planned behavior; reusable lunch box; college campus; student.

## 1. Introduction

Global is seriously combatting single use plastic waste through reduce, reuse and recycle strategies to minimize plastic pollution. Human behavior to use single use plastic have persisted for several decades. Transition phase challenge from single use packaging to reusable packaging bring the serious challenge to industry producers (Mahmoudi & Parviziomran, 2020). Thus, the linier model 'take, use, dispose' to economic circular framework is not only for industrial process but also consumption behavior (Arijeniwa et al., 2024). In fact, reusable system that using plastic packaging to take away has a lower global warming potential than single use plastic packaging (Greenwood et al., 2021). Reusable model can reduce more than 20% of total plastic waste that leaking into the sea annually until 2024. Beside on that, using reusable model in big scale can give useful impact, not only for fighting plastic pollution, but also reducing raw material, greenhouse emission gas, and water consumption significantly. This business opportunity about USD10 billion

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that benefit for consumer and as a part of the important element to reduce waste and plastic pollution (Ellen MacArthur Foundation, 2017, 2023). Global warming potential from single use packaging is 1,3 times higher than 10 times of reusable packaging use through minimum six times usage than single use packaging (Yadav et al., 2024). The other study shows that reusable packaging can produce global warming potential higher than single use system, if energy investment and material in reusable cannot be recovered because the willingness to reuse is too low.

Researchers discovered micro plastic pollution in the deep sea, snow in the Artic and ice in Antarctica; on the shell, table salt, mineral water and beer; and floating in the air or fall in with rain through mountain and city (Lim, 2021). Primary microplastics degraded into small pieces and secondary microplastics is fragmented as small pieces based on the environment. The process likes physical degradation, chemical and biology process (Kim et al., 2022). Microplastics are able to disrupt cell and tissue in human body as unidentified thing that impacted lung inflammation and cause the cancer (Lim, 2021). Microplastic impacts starts from single use plastic consumption behavior. Intervention to reduce single use plastic consumption is important. For instance, environmental problem, plastic pollution problem that cause by human behavior. Global plastic pollution is projected to 66,1 metric ton/year in 2050 (Yan et al., 2024). In fact, when geologist predict the future of Anthropocene, plastic fossil maybe will be the evidence of human living. The scientists argue that plastic layers is the beginning of Anthropocene after bronze and iron ages, thus this period could be classified as 'plastic era' (Porta, 2021). Human encourage themselves to reducing its ecological footprint through many ways. One of them is reusable as world spotlight because able to maximize product usage particularly on cutlery by them.

The reuse solution is the most important element in International Legally Binding Instrument (ILBI) On Plastic Pollution document (IISD, 2024). A systematic approach is needed to tackle single-use plastic pollution through the adoption of reuse (March et al., 2022). The pacific countries encourage Extended Producers Responsibilities (EPR) optimalization, education strategy, ecofriendly system for public and verification mechanism knowledge for reuse system. In the other, government intervention as the important role in designing reuse policy (Kunamaneni et al., 2019). Plastic pollution problem is projected solve around 78% in 2040 through knowledge and technology approach, low cost in management system as usual (Lau et al., 2020). Consortium Reuse in Asia is included Indonesia, Philippine, Thailand, Vietnam, India support reuse system to be in line with the mainstreaming of the circular economy (DietPlastic, 2024). As a developing country, Indonesia has the highest population in Southeast Asia with the most polluted plastic waste. Thus, Indonesia as a strategic role in reducing plastic waste through understanding the reuse system policy.

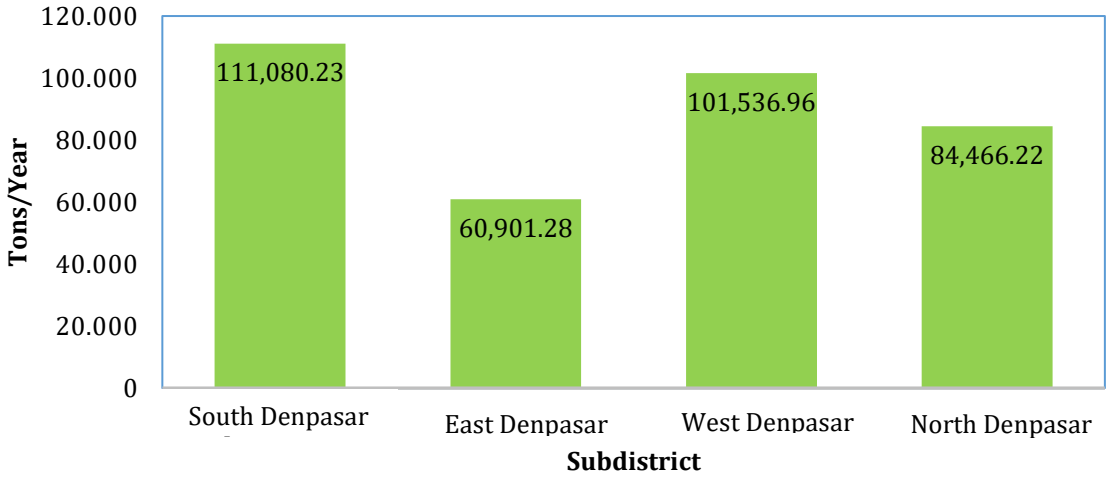


Fig. 1. The amount of waste in Denpasar City
(SIPSN, 2023)

Bali is the favorite worldwide tourism destination in Indonesia. This island produces waste about 1.229.234 tons/year. Denpasar city as the provincial capital has the highest waste production 357.985 tons/year (SIPSN, 2023). Since 2018, this province has a regulation to prevent single use plastic (plastic bag, plastic straw, styrofoam packaging). In 2023, Denpasar took this problem seriously through the regulation about waste management in society. College student as agent of change takes significant role to reduce single use plastic usage. There are 148.517 undergraduate college students in Denpasar that potentially to change the single use plastic behavior to reusable behavior (BPS, 2022).

Reusable system can reduce the total amount of material circulation, reducing plastic from the source and lighten the burden from recycle system, and secure the plastic to save the environment. When reusable works about 10%, the plastic product can reduce equivalent with 50% plastic waste in the ocean every year (World Economic Forum, 2020). Reuse includes repeated focus of product usage or component to specific purpose without significant modification. Reuse is seen as strategic approach to catch the broader sustainable goals. On Plastic Pollution Policy context, reuse is the key strategy to achieve reducing of plastic production from demand side and reducing overall material footprint. However, reuse can help to achieve net zero and change the biodiversity lost (World Wild Fund, 2024). The step of reuse is stated in the regulation of the Minister of Environment and Forestry of the Republic of Indonesia Number P.75/2019 about Reducing Waste Framework that emphasis the importance of reuse to reducing single use plastic usage. Behavior change to reducing single use plastic to reuse is mostly influence by some aspects. Human behavior influences by intention to react, and intention is divided into three main factors such as: attitude, subjective norms, and perceived behavior control.

Theory of Planned Behavior is individual intention to perform behavior. This intention assumed as motivation factor that influence a behavior (Ajzen, 1991). This theory also provides an indication of how hard people are willing to try, how much effort they will put into performing the behavior. In general, the stronger the intention to perform a behavior, the more likely it is that the behavior will be carried out. However, it must be clear that behavioral intention can be realized in behavior only if the behavior is under willpower, for instance: if a person can decide to do that or not to that behavior. Practically, convincing consumer that the reusable utensils that hygiene, this is not effective to increase participation to using reuse system (Pott et al., 2024).

Theory of Planned Behavior (TPB) is mostly using in the research field, especially to understanding intentional and planned behavior in health, environment, and customer behavior. As the research commitment that construct on Theory of Planned Behavior about reducing single use plastic usage (Truelove et al., 2023). The extended Theory of Planned Behavior (TPB) such as attitude, subjective norm, perceived behavior control, moral norm, descriptive norms, and self-identity. Attitude is tendency to response positively and negatively for an object, people, institution, or phenomenon. Attitude is constructed hypothesis cannot be observed directly, must be inferred from measured responses (Ajzen, 2005). Subjective norms developed as the result of social norms, because social norms bring the information about behavior standard that relate in specific situation. When these standards are internalized, they turn into personal norms (Bamberg & Möser, 2007). Subjective norms is a weak predictor for pro-environmental behavior compare with personal and descriptive norms (Niemiec et al., 2020). However, the research of deposit scheme shows that subjective norm is significantly encourage consumer to deposit PET bottle (Amirudin et al., 2023). Perceived behavioral control refers to the ability of people's feeling to do a behavior. It proven that perceived behavior control influenced consumer's intention to reduce single use packaging water bottle (Raimondo et al., 2022). The moderating effect of perceived behavioral control offers further understanding of the theoretical framework and delivers practical guidance for strategic communication aimed at promoting the use of reusables and alternative packaging. (Shah & Yang, 2024).

This research also including personal norms, descriptive norms and self identity to enhance the predictive power of the Theory of Planned Behavior (TPB) in relation to pro-environmental actions. In prediction context pro-environment behavior, personal norms

(moral norms) are the most important to motivate to sustainable reaction. Personal norms describe the people when they think that they do not acting as pro-environment and will break their moral principle of their selves (Niemiec et al., 2020). The urban rural community tends to reduce single use plastic because of moral consideration of prosocial behavior (Oludoye et al., 2024). Descriptive norms are perceptions of how common a behavior is within a population. Descriptive norms influence behavior through give evidence about the act that have great effective and adaptive possibility (Cialdini et al., 1991). Descriptive norms explain significant additional variance in behavioral intention particularly on recycling activity in local community (Passafaro et al., 2019). Self-identity is how far people see their selves as a type of people as pro-environment actor (Whitmarsh & O'Neill, 2010). The positive relationships results showed between reduction of plastic straw use through environmental identity. However, there were not found relationships with policy support (Truelove & Nugent, 2020). The theory model below including personal norms, descriptive norms and self-identity as additional variables for TPB that adapted from previous research (Truelove et al., 2023). Finally, based on the research discussed above, we propose our hypothesized theoretical model (Fig. 2) and the following hypotheses in present study.

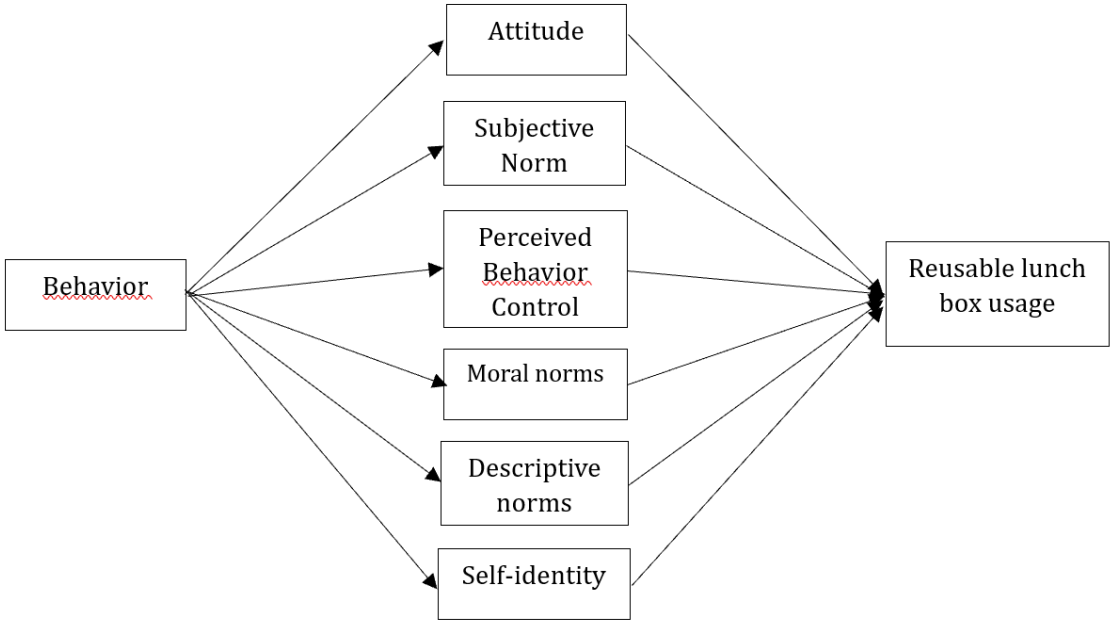


Fig. 2. Hypothesis of theory model to reusable lunch box (RLB) model

The following hypotheses are tested to support the objectives of this study (Figure 2):
*H1: Attitude has a significant effect on student intention of RLB usage*
*H2: Subject norm has a significant effect on student intention of RLB usage*
*H3: Perceived behavior control has a significant effect on student intention of RLB usage*
*H4: Descriptive norms has a significant effect on student intention of RLB usage*
*H5: Moral norms has a significant effect on student intention of RLB usage*
*H6: Self-identity has a significant effect on student intention of RLB usage*

In the context of reusable lunch box usage on college campus, TPB can be used to predict that student will use reusable lunch box based on i) their attitude to use reusable lunch box (is that give them benefit and positive impact); ii) subjective norms (are their friend or lecture support them to use reusable lunch box); and iii) perceived behavior control (are they able to and have a chance to use reusable lunch box); iv) descriptive norms (are their environment support their behavior); v) moral norms (are their behavior is beneficial to their selves) and vi) self-identity (are their behavior important to their selves). These variables then analyze through behavior and intention about reusable lunch box usage.

The present study aims to fill several gaps in the literature. We focus on reusable lunch box usage. After that, we add to the literature by examining extensions to the TPB (moral norms, descriptive norms, and self-identity) in predicting reusable lunch box usage, and building upon studies that have focused on the main TPB constructs of attitude, subjective norm, and PBC. This study conducted questionnaires using snowball sampling technique; for data analysis, the paper used PLS-SEM. Finally, we examine the ability of the behavior to indirectly influence behavior change through changing the targeted TPB constructs in line with suggestions to explore the role of the TPB. Ultimately, this study shows the results about reusable lunch box usage based by college campus student on TPB.

## 2. Methods

This study targeted undergraduated college students in Denpasar City, Bali Province, Indonesia. The increase of single use plastic usage is driving the amount of waste in several regions, one of which is Denpasar, Bali as the one of tourism destination (Hendrawan et al., 2023). Participant on this study is undergraduated student from public and private college campus in Denpasar City, Bali Province, Indonesia. Our recruitment consisted of texting a random of freshman, sophomores, juniors, and seniors at the public and private college based on their willingness to fill the survey form. There are 110 students joined to data collection. All participants completed the survey through ask them questions about TPB that specifically measure the behavior, attitude, subjective norm, perceived behavior control, descriptive norms, moral norms, self-identity and intention to use reusable lunch box (Table 1). Primary and secondary data sources is analyzed in this study.

Table 1. Variable and research indicators

| Variabel | Indicators |
|---|---|
| Behavior | Intensity of reusable lunch box usage |
| | Behavior of bring reusable lunch box usage |
| | Understanding of using reusable lunch box can reduce waste |
| Attitude | Reusable lunch box usage brings the good impact |
| | Student responsibility to use reusable lunch box |
| | Choosing to use reusable lunch box even though it is a hassle |
| Subject norm | Student are supported by their family to bring reusable lunch box |
| | Student are willing to use reusable lunch box |
| | Bring reusable lunch box is good |
| Perceived behavior control | Intention to use reusable lunch box |
| | Intention to use reusable lunch box that give good impact for environment |
| | Understanding the investment of reusable lunch box usage |
| Descriptive norms | Understanding of intensity reusable lunch box usage |
| | Understanding the use of reusable lunch box |
| | Acceptance of cafeteria or food stall to bring reusable lunch box |
| Moral norms | Moral responsibility to save the environment through reusable lunch box usage |
| | Benefit for student to bring reusable lunch box |
| | Benefit for environment to bring reusable lunch box |
| Self identity | Value of bring reusable lunch box |
| | Consistency of reusable lunch box usage |
| | Inspire people to use lunch box |
| Intention | Intention use reusable lunch box |
| | Intention to change behavior for using reusable lunch box |
| | Ability to carry reusable lunch boxes as needed |

The information collected directly from college student through the completion of questionnaires as primary data. On the other hand, journals, statistical data, the internet and books are used to gathered the qualitative analyzed through descriptive technique. The quantitative analysis uses partial least square (PLS) with SmartPLS Version 4.0. In the PLS

method, the sample size in this study is 110, based on for SEM testing models more than 100 (Hair et al., 2017). Structural equation modelling (SEM) application, spesifically PLS-SEM overcomes the seeming dichotomy between confirmatory and predictive research. PLS-SEM aims at testing a theory while offering recommendations for management practice. The measurement model is the relationship between the observed grain and latent variables (Hair et al., 2017). The structural model is assessed by evaluating the path coefficient's explanatory power and degree of significance for the measurement (Sarstedt et al., 2020). The study analysis PLS-SEM is divided in two stages such as measurement model test to tests the indicator construct validity and reliability and structular model to determine the influence between variables using the t-test.

## 3. Results and Discussion

Bali is the favorite worldwide tourism destination. However, this paradise becomes island of waste that produces waste about 1.229.234 tons/year. Denpasar city as the provincial capital has the highest waste production 357.985 tons/year (Figure 1). Since 2018, this city has a regulation to prevent single use plastic (plastic bag, plastic straw, styrofoam packaging). In 2023, Denpasar took this problem seriously through the regulation about waste management in society. It because, reducing single use plastic can be a strategic to start the phase from the linier model 'take, use, dispose' to economic circular framework. It is potential to use reusable model can reduce more than 20% of total plastic waste that leaking into the sea.

College student as future generation that can save the ocean. Students also have capability on critical issue to combat this single use plastic waste. Reducing single use plastic waste through start use reusable lunch boxes examined in this research. The extended Theory of Planned Behavior is used to to fill several gaps in the literature. The current behavior of student that moderate with attitude, subjective norm, perceived behavioral control, descriptive norms, moral norms, self identity to shape the environmental intention. College student as agent of change takes significant role to reduce single use plastic usage.

Table 2. Respondent demographic analysis (N=110)

| Particulars | Classes | Frequencies | Percentage (%) |
|---|---|---|---|
| Genre | Male | 32 | 70.91% |
| | Female | 78 | 29.09% |
| | Total | 110 | 100% |
| Education level | Freshman | 56 | 50.91% |
| | Sophomore | 21 | 19.09% |
| | Junior | 17 | 15.45% |
| | Senior | 16 | 14.55% |
| | Total | 110 | 100% |
| College's type | Public | 59 | 53.64% |
| | Private | 51 | 46.36% |
| | Total | 110 | 100% |
| Domicile | North Denpasar | 25 | 22.73% |
| | East Denpasar | 21 | 19.09% |
| | South Denpasar | 48 | 43.64% |
| | West Denpasar | 16 | 14.55% |
| | Total | 110 | 100% |

There are 148.517 undergraduate college students in Denpasar (BPS, 2022). Thus, this study includes college student to examine their intention to reducing single use plastic through using reusable lunch box. The characteristic of the respondent are genre, education level, college's type, and domicile. Table 2 shows that this study obtained 110 undergratued students in Denpasar, Bali with the majority of respondents' genre that joined on this study is female than male. Their education level is predominantely freshman student (50.91%) in public and private college. This characteristic is unique in connection with the phenomenon

of young generations tend to saving the environment from single use plastic. This point is essential for Indonesia, young generations tend to do campaign sustainable behavior because they know the inclusivity and value for money merits (Van den Bergh et al., 2024). The domicile of this respondent is mostly from South Denpasar (43.64%) that as the second most populated in Denpasar.

Tabel 3. Outer measurement result

| Constructs | Loading factors scale | Composite reliability | Cronbach alpha | Average variant extracted |
|---|---|---|---|---|
| Behavior | 0.806-0.896 | 0.877 | 0.791 | 0.704 |
| Attitude | 0.802-0.851 | 0.863 | 0.763 | 0.677 |
| Subject norm | 0.880-0.884 | 0.821 | 0.687 | 0.615 |
| PBC | 0.771-0.842 | 0.848 | 0.740 | 0.651 |
| Descriptive norms | 0.742-0.794 | 0.780 | 0.581 | 0.543 |
| Moral norms | 0.876-0.901 | 0.921 | 0.872 | 0.796 |
| Self-identity | 0.856-0.911 | 0.921 | 0.872 | 0.795 |
| Intention | 0.860-0.875 | 0.902 | 0.837 | 0.754 |

This study uses outer model to test validity and reliability (Table 3). The criteria for appraising the outer model include convergent validity, discriminant validity, and reliability. The convergent validity appraisement is carried out by looking at the value of loading factors and the average variance extracted. Moreover, the respondents' answer is measured by a reliability test using Cronbach's alpha and composite reliability. The recommendation for loading factors above 0.708 (Hair et al., 2019). It indicates that the construct explains more than 50 per cent of the indicator's variance. Thus, this study shows loading factors scale above 0.708. It means acceptable item reliability for all indicators variance of the construct with loading.

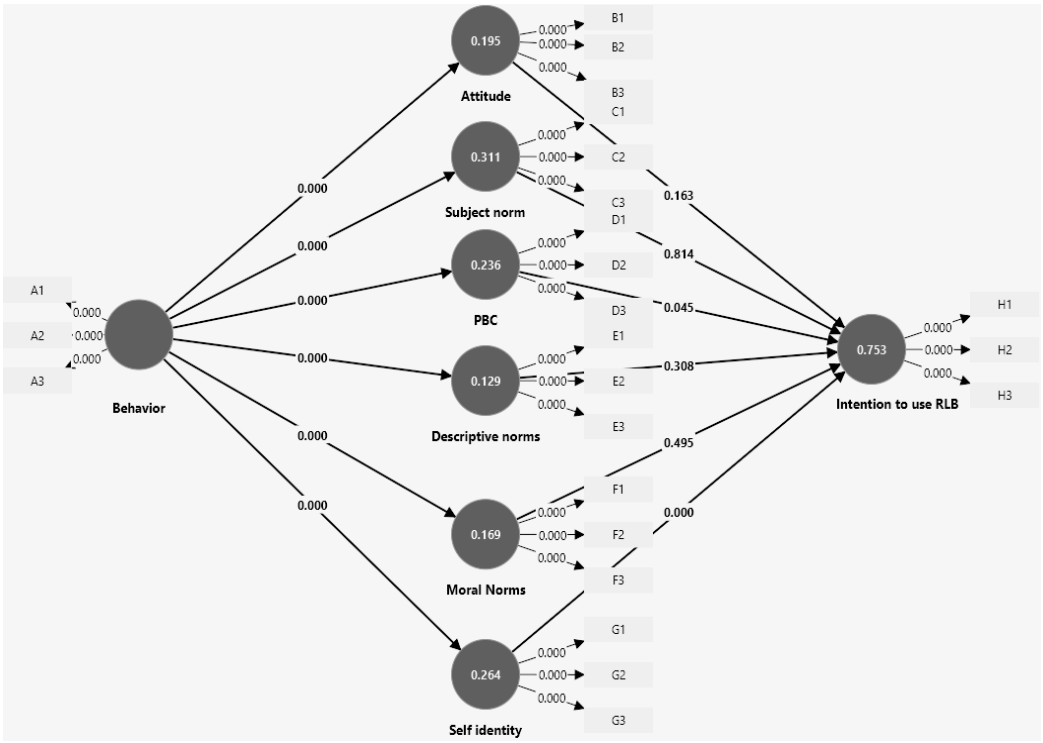


Fig. 3. PLS-SEM structural analysis

The reliability analysis results in Table 3 show that the composite reliability has met the criteria based on the rule of thumb. In contrast, Cronbach's alpha did not show the criteria for subjective norms and descriptive norms. Composite reliability has more precise

measure of reliability than Cronbach's alpha. Probably, Cronbach's alpha too conservative, and the composite reliability may be too liberal. These two extreme values are typically viewed as within by the construct's true reliability. In addition to the reliability test, the average variance extracted (AVE) is used for evaluating a construct's convergent validity that for all items on each construct. Every item of constructs will be accepted if the value of AVE is more than 0.50. This indicates that the construct explains at least 50 per cent of the variance of its items. The Table 3 shows all the construct is significant, so the model's validity can produce a redesign model than the previous one.

Tabel 4. Fornell-larcker results

| | Attitude | Behavior | Descriptive norms | Intention | Moral norms | PBC | Self-identity | Subject norm |
|---|---|---|---|---|---|---|---|---|
| Attitude | 0.823 | | | | | | | |
| Behavior | 0.442 | 0.839 | | | | | | |
| Descriptive norms | 0.504 | 0.360 | 0.737 | | | | | |
| Intention | 0.656 | 0.563 | 0.581 | 0.868 | | | | |
| Moral Norms | 0.669 | 0.411 | 0.610 | 0.758 | 0.892 | | | |
| PBC | 0.713 | 0.486 | 0.574 | 0.706 | 0.725 | 0.807 | | |
| Self-identity | 0.594 | 0.514 | 0.569 | 0.829 | 0.797 | 0.639 | 0.892 | |
| Subject norm | 0.635 | 0.558 | 0.599 | 0.644 | 0.664 | 0.680 | 0.669 | 0.784 |

The results of Fornell-Larcker method on Table 4 show no discriminant validity indicators. All variables accepted in this study are mutually exclusive and support the validity of discriminants between each variable. It shows that discriminant validity testing was carried out using Fornell-Larcker by comparing the square roots of each AVE value obtained on variables displayed diagonally with the correlation coefficient (off-diagonal). The test results of the Fornell-Larcker criterion and the Heterotrait-Monotrait (HTMT) show a lack of discriminant validity because some of the variables have correlations ratio more than 0.9 (Table 5). The HTMT definition is the mean value of the item correlations across constructs relative to the (geometric) mean of the average correlations for the items measuring the same construct. Thus, the result indicates discriminant validity problems did not present when HTMT values is low.

Tabel 5. Fornell-Larcker and HTMT results

| | Attitude | Behavior | Descriptive norms | Intention | Moral Norms | PBC | Self-identity | Subject norm |
|---|---|---|---|---|---|---|---|---|
| Attitude | | | | | | | | |
| Behavior | 0.543 | | | | | | | |
| Descriptive norms | 0.790 | 0.512 | | | | | | |
| Intention | 0.820 | 0.683 | 0.834 | | | | | |
| Moral Norms | 0.819 | 0.480 | 0.870 | 0.881 | | | | |
| PBC | 0.953 | 0.571 | 0.873 | 0.878 | 0.902 | | | |
| Self-identity | 0.718 | 0.606 | 0.801 | 0.965 | 0.909 | 0.776 | | |
| Subject norm | 0.796 | 0.737 | 0.938 | 0.766 | 0.804 | 0.865 | 0.802 | |

The structural models can be evaluated by looking at the R-square (R2). R2 values of 0.75, 0.50 and 0.25 are considered substantial, moderate and weak. R2 values of 0.90 and higher are typical indicative of overfit (Hair et al., 2019). The results of the R-square analysis on Table 6 shows that intention the student to use reusable lunch box 31,1% is slightly weak

influenced by subject norm; 26,4% is slightly weak influenced by self identity; other variables (attitude, descriptive norms, moral norm, PBC) are less than 25%.

Table 6. Model evaluations through R-square

| | Attitude | Descriptive norms | Moral norms | PBC | Self-identity | Subject norm | Intention |
|---|---|---|---|---|---|---|---|
| R-square | 0.195 | 0.129 | 0.169 | 0.236 | 0.264 | 0.311 | 0.753 |
| R-square adjusted | 0.188 | 0.121 | 0.161 | 0.229 | 0.257 | 0.305 | 0.739 |

The two objectives of this research were attained. The research analysis in Table 7 shows that effect of perceived behavior control to intention for using reusable lunch box with t-test is 2.007> t-table and P value 0.045<0.05, so the third hypothesis is supported (H3); the self-identity to intention for using reusable lunch box with t-test is 6.428 > t-table, and the P value is 0.000<0.05 so the sixth hypothesis is supported (H6). The rest of the hypotheses are not supported because they have t-test smaller than t-table and P value are higher than 0.05. These are attitude-intention (H1) with t-test is 1.395<t-test and P value is 0.163>0.05, subject norms-intention (H2) with t-test is 0.236<t-test and P value is 0.814>0.05, descriptive norms-intention (H4) with t-test is 1.020< t-test and P values is 0.308>0.05, moral norms-intention (H5) with t-test is 0.682 and P value is 0.495<0.05 for using reusable lunch box.

The intention of the undergraduated student to use reusable lunch box is strongly influenced by perceived behavior control and self identity. This finding reinforce existing evidence for the importance of social perception in predicting environmentally-significant behaviour. The student's intention to choose reusable takeaway box can increase through perceived green attributes (Li et al., 2024). Perceived behavior control is positively and significantly affected the intention to reduce single use packaging (Aslam et al., 2019; Oludoye & Supakata, 2024; Van den Bergh et al., 2024; Wang et al., 2024). In the other study, perceived behavior control relates most to behavioral willingness of reducing single use packaging (Wang et al., 2024). It can be a chance to approach the college campus and public management to start the reusable use packaging system (Breuer et al., 2024).

Tabel 7. Hypothesis test summary

| | Coefficient value (β) | Standard deviation (STDEV) | T statistics | P values | Supported |
|---|---|---|---|---|---|
| H1: Attitude -> Intention | 0.128 | 0.092 | 1.395 | 0.163 | No |
| H2: Subject norm -> Intention | -0.020 | 0.084 | 0.236 | 0.814 | No |
| H3: PBC -> Intention | 0.186 | 0.093 | 2.007 | 0.045 | Yes |
| H4: Descriptive norms -> Intention | 0.063 | 0.062 | 1.020 | 0.308 | No |
| H5: Moral Norms -> Intention | 0.065 | 0.096 | 0.682 | 0.495 | No |
| H6: Self-identity -> Intention | 0.559 | 0.087 | 6.428 | 0.000 | Yes |

Self-identity to be a significant behavioural determinant over and above Theory of Planned Behavior variables for use reusable lunch box. This theory provides an indication of how hard people are willing to try, how much effort they will put into performing the behavior. In general, the stronger the intention to perform a behavior, the more likely it is that the behavior will be carried out. Self-identity is how far people see their selves as a type of people as pro-environment actor (Whitmarsh & O'Neill, 2010). Eventhough this model only supported 26,4%, but through the P-values shows significant. Self identity evidences the student value, consistency and inspiration because can be a role model to others. By witnessing others using a reusable takeaway box increased the odds of choosing one oneself

(Dorn & Stöckli, 2018). Currently, the strategic directions and insights through sharing platform industry influence environmental literacy that affects consumption tendency (Aktan & Kethüda, 2024). This is confirmed the one behavior-specific personality trait that can to a large extent escape these limitations is the belief in self-efficacy or control over a given behavior (Ajzen, 2005).

Developed by Ajzen, the Theory of Planned Behavior (TPB) suggests that three key elements attitude (AT), subjective norm (SN), and perceived behavioral control (PBC) work together to influence both an individual's intention and their actual behavior (Srivastava et al., 2023). Within the domain of attitudes, it is customary to distinguish between verbal and nonverbal responses that reflect beliefs, emotions, and behavioral tendencies. Several theorists posit that this hierarchical structure of responses corresponds to three qualitatively distinct components of attitude: cognition, affect, and conation. This hierarchical model is supported by empirical findings, wherein evaluative attitudes occupy the highest level, followed by cognition, affect, and conation at the intermediate level, and specific beliefs, feelings, and behavioral inclinations at the lowest level (Ajzen, 2005). Attitude is constructed hypothesis cannot be observed directly, must be inferred from measured responses (Ajzen, 2005). In this study, attitudes have a small influence on the behavioral intentions of students. It proven by the study about breaking the single use plastic driver (Oludoye & Supakata, 2024). However, this result contrast in perception the risk of single use packaging that intention is positive influenced by attitude (Raimondo et al., 2022; Tu et al., 2021; Van et al., 2021). Also, it contrary with (Srivastava et al., 2023) that attitude has the strongest relation to pro-environmental intention. This implies that attitudes may no longer serve as the primary determinant for individuals who have already taken action to use reusable lunch box consumption. Instead, this phenomenon may be driven by other motivations, such as perceived effectiveness of their actions, external incentives and habituation. This underscores the need to account for divers motivational factors at various stages of behavior change (Oludoye & Supakata, 2024).

Subjective norms identified as the second primary determinant of intention within the Theory of Planned Behavior, are likewise conceptualized as functions of belief albeit of a different nature. Specifically, these entail individuals' beliefs that salient referent individuals or groups either approve or disapprove of performing a given behavior, or that these referents themselves do or do not engage in the behavior. In this research, subjective norms insignificant to support the intention of student to use reusable lunch box. As subjective norms developed as the result of social norms, because social norms bring the information about behavior standard that relate in specific situation. When these standards are internalized, they turn into personal norms (Bamberg & Möser, 2007). The insignificant relationship between subjective norms and intention is also found in single use packaging usage (Aslam et al., 2019; Wang et al., 2024). Subjective norms is a weak predictor for pro-environmental behavior compare with personal and descriptive norms (Niemiec et al., 2020). It determined that intention of student to use reusable lunch box may not direct support from student's family and their willingness to do action.

Perceived behavioral control (PBC) has been empirically demonstrated to correlate significantly with the propensity to perform specific behaviors and accounts, at least in part, for such tendencies (Ajzen, 2005). PBC refers is an individual perceives the stage of constrait or of performing a particular behavior (Srivastava et al., 2023). The research analysed PBC has significant relation to intention of reusable lunch box use. It proven that perceived behavior control influenced student's intention to use reusable lunch box (Raimondo et al., 2022; Wang et al., 2023). The moderating effect of perceived behavioral control offers further understanding of the theoretical framework and delivers practical guidance for strategic communication aimed at promoting the use of reusables and alternative packaging. (Shah & Yang, 2024). The student believe use reusable lunch box can give good impact for environment and they understand the investment of reusable lunch box usage.

The insignificant of descriptive norms to the student's intention use reusable lunch box because it doesn't prove the act that have great effective and adaptive possibility. However, the other study found soft science students have a strong descriptive norm to drink reusable

bottle (Fedi et al., 2021). Descriptive norms explain significant additional variance in behavioral intention particularly on recycling activity in local community (Passafaro et al., 2019). The result means student may not interest in intensity reusable lunch box usage and probability the student to bring their reusable lunch box to the cafeteria or food stall.

In prediction context pro-environment behavior, personal norms (moral norms) are the most important to motivate to sustainable reaction. However, in this research, moral norms did not predict change the intention to use reusable lunch box. It also confirmed from the experiment about reducing single use plastic (Truelove et al., 2023). The contradictory research found people tends to reduce single use plastic because of moral consideration of prosocial behavior (Oludoye et al., 2024). On this research, student did not feel the correlation between bring reusable lunch box for save the environment. Self-identity demonstrated significant relation to intention to bring reusable lunch box. It means how far people see their selves as a type of people as pro-environment actor (Whitmarsh & O'Neill, 2010). The positive relationships results showed between reduction of plastic straw use through environmental identity. However, there were not found relationships with policy support (Truelove & Nugent, 2020). The student put the value of bring reusable lunch box and will bring it concistently and inspire people to use reusable lunch box. However, the self-identity can implement properly if there is supported by policy in college and government.

A holistic approach is an effective way to address environmental, economic, social, legal and infrastructure challenges in multilayer plastic waste management in Indonesia. Starting from the adoption of appropriate technology, strengthening Extended Producers Responsibilities policies, improving infrastructure and strengthening collaboration. That waste management in Indonesia is in accordance with the principles of a circular economy (Anwar et al., 2025). The preparation to drive reuse policy in Indonesia is based on this pentahelix model. This model collaborates between academician as conceptor, producer as enabler, civil society organization as accelerator, government as regulator, and media as expander. The success of the reuse system can measure through count the break event sustainability – produced carbon in production process and prevented carbon production while using. Therefore, this reuse system needs to be promoted in the Global Plastics Treaty by bringing together multinational companies, governments and institutions for its development (March et al., 2022).

This reuse system can be new norms as coherent policy mix through reuse system definition, setting standards and standardizing systems, and providing clear targets (March et al., 2022). The Indonesian Government can conduct various meetings and reuse business consultation and civil society to promote the reuse system as a single-use plastic solution. Dietplastik Indonesia, Enviu, Siklus dan P4G had initiated "Reuse Special Interest Group" in November 2022 to advocate reuse and refill to be a part of waste management to reduce single use plastic (Nusantara, 2023). Invite industries to deliver their Extended Producers Responsibility to build reuse infrastructure networks as policy instruments. The driving factor for the reuse system grows rapidly. The policy will not only benefit businesses but also encourage community-driven innovation. The use of reusable goods is deeply rooted in the traditions of many Asian communities, making the transition from single-use plastics easier including in college (GAIA, 2024). This study can be the academic perspective to build the collaboration between all stakeholders to facilitate just transitions, ensuring that all stakeholders can adapt and integrate within the system smoothly and equitably (GAIA, 2024). The transition phase challenge from single use packaging to reusable packaging bring the serious challenge to industry owners (Mahmoudi & Parviziomran, 2020). Thus, the linier model 'take, use, dispose' to economic circular framework is not only for industrial proses but also consumption behavior in college (Arijeniwa et al., 2024).

While this study demonstraed the insights and implications, it is important to understand the constraints that need attention in subsequent research. First, we investigated the intention toward embracing reusable lunch box usage, rather than scruitnizing actual usage behavior. Future research may thus exercise usage patterns exhibited by real student in their engagement with RLB. Second, while we augmented TPB

and pro-environmental behavior, future research should aim to include the other supplementary factors such as type of reusable lunch product, economic incentives, health benefit, convenience considerations on students to adopt RLB. Third, future study should build intervention across colleges, including schools in different regions to incorporate a nationally representative sample of Indonesia to bolster the generalizability and applicability of the findings.

## 4. Conclusions

Reusable lunch boxes have a lower global warming potential than single use plastic containers after just 2 to 4 uses. People were more willing to engage in reuse systems with which they were already familiar as long as the term 'reuse' needs to be considered (Greenwood et al., 2021). Perceived behavioral control refers to the ability of people's feeling to do a behavior. The influence to some pro-environmental behavior was well-proven, particularly on TPB side (Raimondo et al., 2022; Shah & Yang, 2024). It can be strengthening by the student' self-identity campaign about the environmental literacy of using reusable lunch box. Futhermore, the interrelationship between place identity, role identities, social identities also important.

The future research is how to create reusable lunch box easier to use and make it a system to encourage behavior change in college campus. Reuse is seen as strategic approach to catch the broader sustainable goals. Reuse is the key strategy to achieve reducing of plastic production from demand side and reducing overall material footprint. However, reuse can help to achieve net zero and change the biodiversity lost (World Wild Fund, 2024). The holistic approach should drive reuse policy in Indonesia is based on this pentahelix model. This model collaborates between academician as conceptor, producer as enabler, civil society organization as accelerator, government as regulator, and media as expander. Thus, student can start their role as academician as conceptor to encourage reusable lunch box behavior familiar and become regulation in their college.

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## Author Contribution
The author conceived the study, designed the methodology, collected and analyzed the data, interpreted the results, and wrote the manuscript.

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