Behavioral Intention Model for Waste Sorting among Indonesian Urban Millennial Workers

Yovita Ramos Marbun, Artiawati, Renny Azaria
Faculty of Psychology, Universitas Surabaya

This study explores how subjective norm, perceived behavioral control, and expectation influence waste sorting intention among urban millennial workers in Indonesia. Using data from 406 respondents, the study applied a quantitative survey analyzed with Structural Equation Modeling (SEM). The results show that perceived behavioral control affects expectation, which partially mediates its impact on intention. Both perceived behavioral control and expectation also directly influence intention, while subjective norm emerges as the strongest predictor, highlighting the role of social pressure in a collectivist culture. The findings suggest the need to strengthen social norms, enforce regulations, and improve infrastructure. Limitations include the focus on millennials, self-reported data, and a cross-sectional design. Future studies should target more diverse populations and track behavioral changes longitudinally.

INTRODUCTION

Waste sorting, the process of categorizing waste into types such as organic, inorganic, and hazardous, is a crucial component of pro-environmental behavior in waste management. As a critical global issue, waste production is projected to increase by 73% by 2050, reaching 3.88 billion tons (Goh et al., 2022). In Indonesia, data from the Ministry of Environment and Forestry (MoEF, 2025) indicate that waste generation reached 33.9 million tons in 2024, with 40.2% inadequately managed, posing serious environmental and health risks.

Despite ongoing efforts, barriers to effective waste management in developing countries include inadequate infrastructure, weak regulations and enforcement, public indifference, and distrust in waste management systems (Azevedo et al., 2021). This public indifference highlights the need for behavioral change, particularly in waste sorting, to improve the overall effectiveness of waste management (He et al., 2020; Xia et al., 2021).

Previous research indicates the importance of community engagement, social norms, and tailored interventions in promoting waste sorting behaviors (Goh et al., 2022). In Indonesia, programs like *Bank Sampah*

Author info: Correspondence should be sent to: Dr. Artiawati, Jl. Raya Kalirungkut, Kecamatan Rungkut, Surabaya, Jawa Timur 60293.
artiawati@staff.ubaya.ac.id
North American Journal of Psychology, 2025, Vol. 27, No.3, 797-808.

(Waste Bank) and *Rumah Kompos* (Compost Center) have been implemented to encourage waste sorting through education and incentives. However, challenges such as time constraints and lack of awareness hinder their effectiveness (Marbun et al., 2024). According to Statistics Indonesia (BPS, 2021), only 9% of Indonesians actively sort their waste.

These challenges highlight the urgent need to investigate the psychological factors influencing waste sorting behavior in urban settings. As a significant segment of the global workforce, millennials play a vital role in promoting pro-environmental behavior, including waste management, due to their technological engagement and environmental awareness, as demonstrated in a study involving respondents from 42 countries—mostly in Europe (Drozd & Trager, 2019). However, research specifically focusing on Indonesian urban millennial workers in the context of waste management remains limited. Most current studies involve participants with diverse ages, backgrounds, employment statuses, and geographic locations (Ardi et al., 2024; Diniary et al., 2024). Given this demographic's potential and the escalating waste problem in urban areas, as reported by the Indonesian Ministry of National Development Planning (Bappenas, 2023), understanding the psychological drivers behind their behavior is essential for designing effective interventions.

To better understand and address these behavioral challenges, this study adopts two theoretical frameworks: the Theory of Planned Behavior (TPB) and Expectancy Theory. TPB posits that behavior results from deliberate planning and is predicted by intention, which is shaped by three components: attitude toward the behavior, subjective norm (perceived social pressure), and perceived behavioral control (the perceived ease or difficulty of performing the behavior) (Ajzen, 1991). Expectancy Theory, on the other hand, suggests that motivation is determined by three elements: expectation (the belief that effort will lead to performance), instrumentality (the belief that performance will lead to outcomes), and valence (the value placed on the expected outcome) (Vroom, 1964). Both theories emphasize that individuals are rational decision-makers who consider perceived consequences before engaging in a particular behavior.

The Theory of Planned Behavior (TPB) is widely used to predict pro-environmental behaviors, including waste sorting (Octav-Ionut, 2015; Steg & Vlek, 2008). While attitude is often a significant predictor (Tian & Liu, 2022), subjective norm and perceived behavioral control tend to exert a stronger influence, particularly in Eastern cultures (Huang et al., 2022). Moreover, to enhance the explanatory power of TPB, Wang et al. (2021) suggest incorporating additional variables, such as expectation and environmental concern. Differing from previous research, this study integrates TPB with Expectancy Theory and examines the direct effects of

subjective norm, perceived behavioral control, and expectation on intention, rather than relying solely on expectation as a mediator.

Expectation, defined as an individual's belief that their efforts will lead to tangible positive outcomes (Vroom, 1964), is particularly relevant to millennials. This generation values purposeful action and visible impact (W et al., 2020), making them more likely to be motivated and engaged in waste sorting when they perceive clear benefits. In Jakarta and Surabaya, millennials constitute 26.46% of the workforce and are increasingly represented in policymaking roles (BPS, 2022a, 2022b). Their growing presence in strategic decision-making positions underscores the importance of expectation—not only in shaping individual behavior, but also in influencing how institutional policies are developed to foster broader engagement in sustainable waste management.

This study addresses the research gap by employing an extended Theory of Planned Behavior integrated with Expectancy Theory, in contrast to previous studies that did not adopt this combined framework (Ardi et al., 2024; Diniary et al., 2024). A total of seven hypotheses are proposed in this study. The direct hypotheses are: (H1) subjective norm positively affects urban millennial workers' expectation of waste sorting; (H2) perceived behavioral control positively affects urban millennial workers' expectation of waste sorting; (H3) expectation significantly affects urban millennial workers' intention to sort waste; (H4) subjective norm significantly affects urban millennial workers' intention to sort waste; and (H5) perceived behavioral control significantly affects urban millennial workers' intention to sort waste. The mediation hypotheses are: (H6) the effect of subjective norm on waste sorting intention is mediated by expectation, and (H7) the effect of perceived behavioral control on waste sorting intention is mediated by expectation. The conceptual model illustrating these hypotheses is presented in Figure 1.

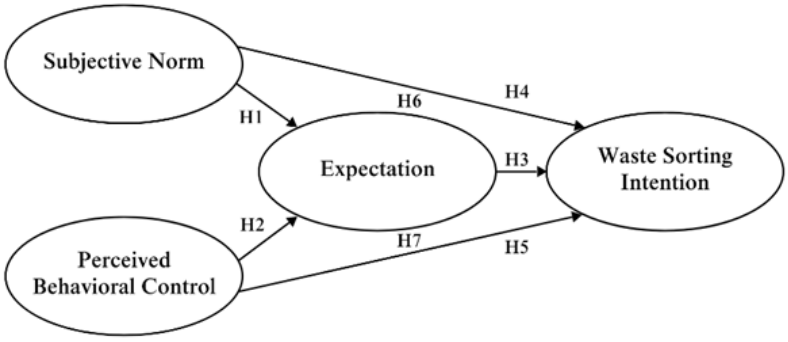

Figure 1 Conceptual framework of the proposed hypotheses

METHOD

Participant

This study involved 406 participants, with 48% from Jakarta and 52% from Surabaya. Of these, 57% were female and 43% were male. In terms of age, 37% of participants were classified as Early Millennials (38–43 years), 37% as Mid Millennials (33–37 years), and 26% as Late Millennials (28–32 years). Most participants were employed in the private sector (64%), followed by civil servants (26%), self-employed individuals (10%), and social workers (<1%). Regarding education, 57% held a Bachelor's degree, 32% a Master's degree, while smaller proportions had a High School/Vocational School qualification (4%), a Diploma (5%), or a Doctoral degree (<3%). Income distribution showed that 34% of respondents earned over IDR 15 million per month; 29% earned between IDR 5 million and IDR 10 million; 15% earned between IDR 10 million and IDR 15 million; and 15% earned less than IDR 5 million. Fewer than 8% chose not to disclose their income.

Procedure

This study was conducted in Indonesia's two largest cities, Jakarta and Surabaya. Online questionnaires were distributed via social media platforms to married millennials (aged 28–43) working in these cities. Of the 408 responses collected, two incomplete questionnaires were excluded, resulting in a final sample of 406 participants and a 99% valid response rate. The sample size was considered representative at a 95% confidence level, based on calculations using the Raosoft Sample Size Calculator.

Material

The measurement scale comprises 19 items adapted from Wang et al. (2021), who developed it based on the Theory of Planned Behavior and Expectancy Theory to measure subjective norm, perceived behavioral control, expectation, and behavioral intention to sort waste (see Table 1). These items were translated into Indonesian using the forward translation method by the research team.

To ensure measurement precision, two steps were undertaken (Solhi et al., 2021). Firstly, content validity was assessed using the content validity ratio, with input from three subject matter experts to refine the items. Secondly, a pilot test involving 30 participants was conducted to further confirm content validity. The instrument employed a 6-point Likert scale (1 = *strongly disagree* to 6 = *strongly agree*). Data were analyzed using SPSS and AMOS version 29.0. Confirmatory factor analysis (CFA) was conducted to verify the validity and reliability of the measurements, followed by structural model analysis. Path coefficients were evaluated, with particular attention to model fit indices (Yin & Ma, 2022).

Table 1 Measurement scales

Construct / Variable	Sample Item	*Cronbach's Alpha*	
		Original Study	This Study
Subjective Norm	*Sebagian besar orang yang penting bagi saya berpikir bahwa saya sepatutnya memilah sampah.* (Most of the important people in my life think that I should sort my waste.)	0.773	0.838
Perceived Behavioral Control	*Saya memiliki waktu yang cukup untuk memisah-misahkan sampah.* (I have enough time to separate my waste.)	0.791	0.896
Expectation	*Saya yakin bahwa saya memiliki pengetahuan untuk melakukan pemilahan sampah.* (I am confident that I have the knowledge to sort waste properly.)	0.854	0.876
Behavioral Intention to Sort Waste	*Saya suka mempelajari cara memilah sampah di sekitar saya tanpa diminta oleh orang lain.* (I enjoy learning how to sort waste around me without being asked by others.)	0.840	0.838

Note. The original scale was developed by Wang et al. (2021).

RESULTS

Establishment of the Model and Measurements

A total of five items from all measurements were removed due to low factor loadings (<0.50), which led to an improvement in model fit. Confirmatory factor analysis was then performed using maximum likelihood estimation to assess construct reliability and validity. The model fit was satisfactory (Chi-square/degree of freedom (df) = 2.765, RMSEA = 0.066, GFI = 0.938, AGFI = 0.908, CFI = 0.963, and TLI = 0.953). Several fit indices exceeded the recommended thresholds, while the remaining indices were within acceptable limits—specifically, CMIN/DF ≤ 3, RMSEA ≤ 0.08, and GFI, AGFI, CFI, TLI ≥ 0.90 (Hu & Bentler, 1999; Kline, 2023).

Consistent with the model fit results, composite reliability ranged from 0.792 to 0.907 (>0.70), confirming model consistency and reliability. Factor loadings (0.572–0.925) and AVE (0.515–0.752) exceeded the 0.50 threshold, indicating good convergent validity (see Table 2). The

minimum √AVE (0.802) was higher than the highest correlation among latent constructs (0.637), and the HTMT ratio (0.36–0.64) remained below 0.85, confirming discriminant validity (Cheung et al., 2024). These results supported the reliability and validity of the measurement model; therefore, structural model analysis was subsequently performed.

Table 2 Results of reliability and validity analysis

Construct and Item		Loading	*CR*	*AVE*
Subjective Norm	N1	0.924	0.792	0.679
	N2	0.925		
	N4	0.572		
Perceived Behavioral Control	K1	0.911	0.864	0.752
	K2	0.899		
	K3	0.786		
Expectation	E1	0.825	0.907	0.708
	E2	0.906		
	E3	0.789		
Behavioral Intention to Sort Waste	I1	0.690	0.817	0.515
	I3	0.674		
	I5	0.825		
	I6	0.729		
	I7	0.658		

Note. *CR* = Composite Reliability; *AVE* = Average Variance Extracted.

Structural Model Analysis

Results from the structural model analysis indicated a satisfactory model fit, with the following indices: Chi-Square/df = 2.765, RMSEA = 0.066, GFI = 0.938, AGFI = 0.908, CFI = 0.963, and TLI = 0.953.

Based on Table 3, subjective norm did not significantly affect expectation (H1, $\beta = 0.080$, $p = 0.135$). In contrast, perceived behavioral control had a strong and significant effect on expectation, with the highest path coefficient among all predictors (H2, $\beta = 0.586$, $p = 0.001$). Furthermore, expectation significantly predicted the intention (H3, $\beta = 0.255$, $p = 0.001$), as did subjective norm (H4, $\beta = 0.442$, $p = 0.001$) and perceived behavioral control (H5, $\beta = 0.226$, $p = 0.007$). The effect of subjective norm on waste sorting intention was stronger than that of both perceived behavioral control and expectation.

Mediating Effect Analysis

The mediating effect was analyzed using the bootstrapping method, which does not require the assumption of a normal distribution and offers

more reliable results compared to other methods (Kline, 2023; Williams & MacKinnon, 2008).

The analysis revealed that the indirect effect of subjective norm on intention through expectation was not significant (H6, $\beta = 0.020$, $p = 0.090$). However, the indirect effect of perceived behavioral control on intention through expectation was significant (H7, $\beta = 0.149$, $p = 0.001$). Subjective norm had a significant total effect, primarily driven by its direct influence ($\beta = 0.463$, $p = 0.001$), while perceived behavioral control had a significant total effect on intention ($\beta = 0.375$, $p = 0.001$) (see Table 3).

These findings indicated that subjective norm influenced intention directly, whereas perceived behavioral control influenced intention both directly and indirectly through expectation. Thus, while expectation did not mediate the association between subjective norm and intention, it served as a partial mediator in the association between perceived behavioral control and intention.

Table 3 Results of hypotheses testing

	Path	*Std. Estimate*	*Two-Tailed Significance (BS)*	Result
Direct Effects	SN → Exp (H1)	0.080	0.135	Not Supported
	PBC → Exp (H2)	0.586	0.001	Supported
	Exp → Int (H3)	0.255	0.001	Supported
	SN → Int (H4)	0.442	0.001	Supported
	PBC → Int (H5)	0.226	0.007	Supported
Indirect Effects	SN → Exp → Int (H6)	0.020	0.090	Not Supported
	PBC → Exp → Int (H7)	0.149	0.001	Supported
Total Effects	SN → Exp	0.080	0.135	Not Supported
	PBC → Exp	0.586	0.001	Supported
	Exp → Int	0.255	0.001	Supported
	SN → Int	0.463	0.001	Supported
	PBC → Int	0.375	0.001	Supported

Note. Based on 2,000 bootstrap samples; *Std.*= Standardized; *BS* = Bias-Corrected 95% C.I.
SN = Subjective Norm; PBC = Perceived Behavioral Control; Exp = Expectation;
Int = Behavioral Intention to Sort Waste.

DISCUSSION

The behavioral intention model for waste sorting among Indonesian urban millennial workers, as proposed in this study, was supported by the empirical data. Subjective norm and perceived behavioral control functioned as antecedents. While expectation did not serve as a mediator

in the association between subjective norm and intention, it did partially mediate the association between perceived behavioral control and intention.

The analysis further revealed that subjective norm did not significantly influence expectation, whereas perceived behavioral control had a strong and positive effect. Expectation itself significantly predicted intention, reinforcing its mediating role in the behavioral process. These results help explain why expectation mediated the relationship between perceived behavioral control and intention, but not that of subjective norm.

Although perceived behavioral control and expectation significantly influenced intention, subjective norm exerted the strongest direct effect. This suggests that subjective norm shaped behavior externally through social pressure rather than by influencing internal beliefs about capability. The prominent influence of subjective norm on waste sorting intention aligns with the findings by Huang et al. (2022), who observed similar patterns among Chinese youth, and reflects Indonesia's collectivist culture, where family and group norms strongly shape behavior.

In addition to its direct influence, perceived behavioral control exerted an indirect effect on intention via expectation. Urban millennial workers who felt capable of overcoming barriers such as time, effort, cost, and limited facilities tended to have stronger expectation and intention to sort waste. This finding aligns with Rousta et al. (2020), who found that accessible infrastructure enhanced individuals' sense of control and participation in waste sorting. Similarly, Marbun et al. (2025) reported that millennial workers in Jakarta and Surabaya often expressed low expectations due to inadequate facilities and poor waste management systems, highlighting the importance of supportive infrastructure in translating perceived capability into intention through expectation.

This study contributes to the theoretical development of the Theory of Planned Behavior (TPB) by integrating Expectancy Theory to provide a clearer explanation of how its components differentially influence waste sorting intention. While previous studies often found that expectation mediated all TPB components (Wang et al., 2021), this study showed that such mediation applied only to perceived behavioral control. The absence of mediation in the association between subjective norm and intention suggests that, within the Indonesian collectivist context, behavioral intention may be shaped directly by social expectations rather than internal motivational mechanisms. In such cultural settings, adherence to group norms may override personal evaluations of expected outcomes. By incorporating Expectancy Theory, this study highlights the motivational pathway of perceived behavioral control and provides insight into why subjective norm may function independently of such mechanisms.

These findings offer recommendations to strengthen waste sorting behavior among Indonesian urban millennial workers. The government can implement mandatory policies through law enforcement, sanctions, and incentives, while also improving infrastructure, conducting awareness campaigns, and fostering public trust in the waste management system. At the household level, families can encourage sustainable habits early by setting examples, while intergenerational education is key to bridging gaps and fostering shared environmental values. At the community level, initiatives such as waste banks, reward-based programs, and social media—especially platforms popular among millennials and Gen Z—can promote the reinforcement of social norms related to waste sorting.

Limitations of the Study

This study has several limitations that should be acknowledged. Firstly, the sample was limited to millennial workers in Jakarta and Surabaya. While these cities represent major population and economic hubs, the findings may not be generalizable to other demographic groups, such as younger generations or rural areas, where infrastructure and behavioral drivers may differ. Secondly, the study relied on self-reported measures of waste sorting intention, which may be influenced by social desirability bias or recall inaccuracies. Finally, the cross-sectional design limits the ability to establish causality or assess how behavioral intentions and motivations change over time.

Recommendations for Future Research

To address these limitations and expand upon the current findings, future study should consider several directions. Broadening the sample to include participants from different age groups, socio-economic backgrounds, and geographic regions would enhance generalizability and help identify context-specific behavioral determinants. Incorporating objective behavioral data, such as actual waste sorting records or observational studies, could improve validity by reducing reliance on self-reports. Additionally, longitudinal designs are recommended to capture changes in intentions and behaviors, particularly as policies, infrastructure, and social norms evolve. Finally, future studies may explore other psychological constructs—such as moral obligation, environmental identity, or perceived fairness of the waste management system—to enrich the theoretical framework and provide deeper insights for policymakers and practitioners.

In conclusion, this study confirms that the Theory of Planned Behavior (TPB), when integrated with Expectancy Theory, effectively explains waste sorting intention among urban millennial workers in Indonesia.

Subjective norm and perceived behavioral control significantly influenced intention, with expectation partially mediating the effect of perceived behavioral control. While the framework explains behavioral intention through cognitive and motivational pathways, the findings highlight that in a collectivist culture like Indonesia, social pressure can directly shape intention without necessarily activating internal motivation. These insights offer practical implications for promoting green behavior. It is hoped that strengthening waste sorting intentions will encourage greater engagement in pro-environmental behaviors. These actions are expected to support not only environmental sustainability but also individual psychological well-being, reflecting the connection between clean environment and a healthy state of mind.

Acknowledgements

We would like to thank the Ministry of Education, Culture, Research, and Technology for providing the research grant. We also express our sincere appreciation to all survey participants from Jakarta and Surabaya for their valuable contributions.

Funding

The research is funded by the Directorate of Research and Community Service, Directorate General of Research Strengthening and Development, Ministry of Research, Technology, and Higher Education, in accordance with the Research Contract: 004/SP2H/PT/LL7/2024, 055/SP-Lit/LPPM-01/KemendikbudRistek/FP/VI/2024.

Ethical Clearance and Informed Consent

The Institutional Ethics Committee of the University of Surabaya approved the study, as documented in Certificate No. 427/KE/IX/2024. Informed consent was obtained from all participants.

Conflict of Interest

The authors declare no conflicts of interest.

Author Contributions

All authors contributed equally to the conceptualization, data interpretation, review, and editing of the manuscript.

Data Availability

Data are available from the corresponding author upon request.

REFERENCES

Ajzen, I. (1991). The theory of planned behavior. *Organizational Behavior and Human Decision Processes*, *50*(2), 179–211. https://doi.org/10.1016/0749-5978(91)90020-T

Ardi, R., Angel, T. P., & Afif, E. L. (2024). Millennials and generation Z: A study on food waste reduction behavior during the COVID-19 pandemic using PLS-

structural equation modeling. *Evergreen*, *11*(4), 3398–3409. https://doi.org/10.5109/7326976

Azevedo, B. D., Scavarda, L. F., Caiado, R. G. G., & Fuss, M. (2021). Improving urban household solid waste management in developing countries based on the German experience. *Waste Management*, *120*, 772–783. https://doi.org/10.1016/j.wasman.2020.11.001

Cheung, G. W., Cooper-Thomas, H. D., Lau, R. S., & Wang, L. C. (2024). Reporting reliability, convergent and discriminant validity with structural equation modeling: A review and best-practice recommendations. *Asia Pacific Journal of Management*, *41*(2). https://doi.org/10.1007/s10490-023-09871-y

Diniary, A., Indraswari, K. D., & Arundina, T. (2024). Driving factor of Indonesian Muslims' intention in household food waste management: Generational comparison. *Al-Muzara'ah*, *12*(1), 123–136. https://doi.org/10.29244/jam.12.1.123-136

Drozd, K., & Trager, V. (2019). Encouraging pro-environmental behaviour amongst millennials in online communities. Malmö University

Goh, E., Esfandiar, K., Jie, F., Brown, K., & Djajadikerta, H. (2022). Please sort out your rubbish! An integrated structural model approach to examine antecedents of residential households' waste separation behaviour. *Journal of Cleaner Production*, *355*. https://doi.org/10.1016/j.jclepro.2022.131789

He, Y., Kitagawa, H., Choy, Y., Kou, X., & Tsai, P. (2020). What affects Chinese households' behavior in sorting solid waste? A case study from Shanghai, Shenyang, and Chengdu. *Sustainability (Switzerland)*, *12*(21), 1–21. https://doi.org/10.3390/su12218831

Huang, M., Law, K. M. Y., Geng, S., Niu, B., & Kettunen, P. (2022). Predictors of waste sorting and recycling behavioural intention among youths: Evidence from Shenzhen, China and Turku, Finland. *Waste Management and Research*, *40*(6), 721–735. https://doi.org/10.1177/0734242X211036254

Kline, R. B. (2023). *Principles and practice of structural equation modelling* (5th Ed.). New York, USA: Guilford Press

Marbun, Y. R., Akbar, T., & Yunanto, R. (2024). Menggali perspektif lintas budaya: Analisis perbandingan perilaku memilah sampah di Indonesia dan Jerman [Exploring cross-cultural perspectives: A comparative analysis of waste sorting behavior in Indonesia and Germany]. *Anthropos: Jurnal Antropologi Sosial Dan Budaya*, *9*(2), 64–80

Marbun, Y. R., Artiawati, A., & Azaria, R. (2025). Pro-environmental behavior among urban millennial workers : A focus group discussions. *Journal of Educational, Health and Community Psychology*, *14*(1). https://doi.org/10.12928/jehcp.vi.30350

Ministry of Environment and Forestry (MoEF). (2025). Waste management performance report. https://sipsn.menlhk.go.id/sipsn/public/data/capaian

Ministry of National Development Planning (Bappenas). (2023). Study report on waste generation and composition in 6 cities/regencies in Indonesia. https://lcdi-indonesia.id/dokumen-publikasi-dkti-kajian-data-timbulan-sampah-6kota/

Octav-Ionut, M. (2015). Applying the theory of planned behavior in predicting pro-environmental behavior: The case of energy conservation. *Acta Universitatis Danubius*. *Œconomica*, *11*(4), 15–32

Rousta, K., Zisen, L., & Hellwig, C. (2020). Household waste sorting participation in developing countries—A meta-analysis. *Recycling*, *5*(1). https://doi.org/10.3390/recycling5010006

Solhi, M., Heydari, E., Janani, L., & Farzadkia, M. (2021). Development and psychometric properties of a questionnaire to evaluate sustainable waste separation behavior and environmental health promotion. *Journal of the Egyptian Public Health Association*, *96*(1), 1–11. https://doi.org/10.1186/s42506-021-00090-1

Statistics Indonesia (BPS). (2021). Household waste sorting behavior: Biodegradable and non-biodegradable waste. https://www.bps.go.id/id/statistics-table/1/MTM2MCMx/persentase-rumah-tangga-menurut-provinsi-dan-perlakuan-memilah-sampah-mudah-membusuk-dan-tidak-mudah-membusuk--2013-2014--2021.html

Statistics Indonesia (BPS). (2022a). Number of Formal and Informal Workers in DKI Jakarta Province. https://jakarta.bps.go.id/indicator/6/1090/1/jumlah-pekerja-formal-dan-informal-di-provinsi-dki-jakarta.html

Statistics Indonesia (BPS). (2022b). Employment Situation in Surabaya City. https://surabayakota.bps.go.id/id/pressrelease/2022/12/16/309/keadaan-ketenagakerjaan-kota-surabaya-agustuts-2022.html

Steg, L., & Vlek, C. (2008). Encouraging pro-environmental behaviour: An integrative review and research agenda. *Journal of Environmental Psychology*, *29*(3), 309–317. https://doi.org/10.1016/j.jenvp.2008.10.004

Tian, H., & Liu, X. (2022). Pro-environmental behavior research: Theoretical progress and future directions. *International Journal of Environmental Research and Public Health*, *19*(11). https://doi.org/10.3390/ijerph19116721

Vroom, V. (1964). *Work and Motivation*. Wiley

W, R. W. A., Poluakan, M. V., Dikayuana, D., Wibowo, H., & Raharjo, S. T. (2020). Potret generasi milenial pada era revolusi industri 4.0 [A portrait of the millennial generation in the era of the fourth industrial revolution]. *Focus : Jurnal Pekerjaan Sosial*, *2*(2), 187. https://doi.org/10.24198/focus.v2i2.26241

Wang, H., Gui, H., Ren, C., & Liu, G. (2021). Factors influencing urban residents' intention of garbage sorting in China: An extended TPB by integrating expectancy theory and norm activation model. *Sustainability*, *13*, 12985. https://doi.org/10.3390/su132312985

Williams, J., & MacKinnon, D. P. (2008). Resampling and distribution of the product methods for testing indirect effects in complex models. *Structural Equation Modeling*, *15*(1), 23–51. https://doi.org/10.1080/10705510701758166

Xia, Z., Zhang, S., Tian, X., & Liu, Y. (2021). Understanding waste sorting behavior and key influencing factors through internet of things : Evidence from college student community. *Resources, Conservation & Recycling*, *174*, 105775. https://doi.org/10.1016/j.resconrec.2021.105775

Yin, Z., & Ma, J. (2022). Rational choice or altruism factor: Determinants of residents' behavior toward household waste separation in Xi'an, China. *International Journal of Environmental Research and Public Health*, *19*(19). https://doi.org/10.3390/ijerph191911887