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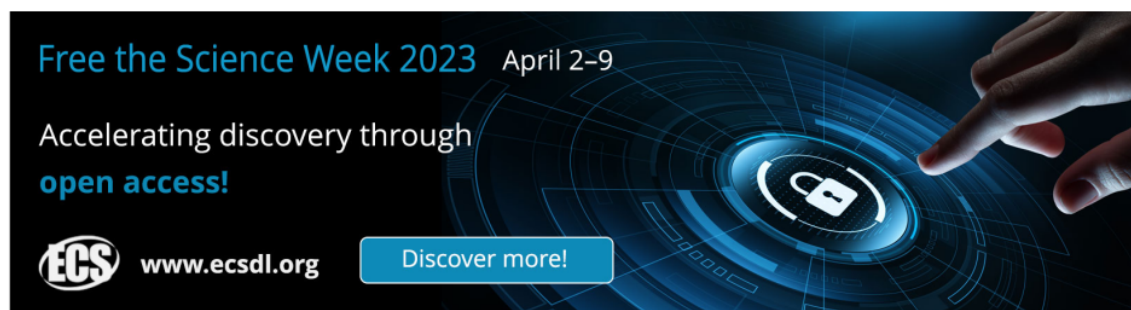
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Environmentally friendly cycling habit behaviour: could social influence, hedonic motivation and psychological needs develop it?

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Abstract. The COVID-19 pandemic has created new habits for the people of Indonesia. Cycling has become a more popular habit and hobby in some society members during mandatory work from home. Self Determination Theory, which explains the human motivation, personality development, and behavioural self-regulation, will be used in this research context to develop a research model. This research examines how hedonic motivation and psychological needs as inner resources for behavioural decision making and social influence as external coercion influences environmentally friendly behaviour. We used multiple regression analysis and found that hedonic motivation and psychological needs influence environmentally friendly behaviour. It can be concluded that environmentally friendly behaviour is more straightforward to develop with inner motivation than external coercion.

1. Introduction

The Covid 19 pandemic that hit Indonesia has given birth to a new habit for some residents in cycling. This situation was proved by the increasing number of bicycle unit sales, especially during the pandemic Cov-19 periods. The motivation for the emergence of this new habit, among others, is to improve the quality of individual health by increasing the immune system or body resistance [1]. In general, people understand that sport is a physical activity as a psychological need carried out by people and groups to achieve physical fitness. Sport is seen as a healthy lifestyle and describes the whole person who interacts with their environment and a pattern of life expressed by the activities of interests and opinions [2]. This understanding gave rise to a new hobby, cycling.

However, the existence of this new hobby has attracted attention, especially to members of the public who are concerned about environmental sustainability. Some things that concern this phenomenon are related to the motivation of individuals who ride cycling. Does one of them motivate to preserve the environment, or is it just a lifestyle that is becoming a trend? Previous research on various motivations for environmental conservation in several lifestyles, especially cycling [3–5] and including green consumption behaviour [6–8], refers to several variables that are usually the drivers of environmentally friendly behaviour (EFB). Specifically, the researcher builds a research model by proposing three variables suspected to be EFB drivers: hedonic motivation, social influence, and psychological need.

The researcher, in this case, wants to explore whether environmentally friendly behaviour which influenced by external and internal motivational factors. In that term, further, we are discussing in Self-Determination Theory (SDT) [11,12] because the SDT is closely related to perceived well-being, one of which is related to environmentally friendly behaviour [13,14]. Nevertheless, this research also mentions the Theory of Planned Behaviour (TPB) [4,9,10] as a basic theory of behavioural research. Well-being has two elements, hedonic or eudaimonic[15]. Hedonia intends life's goals on pleasure or satisfaction [16], whilst eudaimonia intend on meaning or value, which may come in fulfilment, wisdom, and moral virtue [17]. Researchers will examine whether hedonic motivation affects environmentally friendly behaviour, especially in the cycling phenomenon.

Furthermore, a review related to social influence variables has also been carried out. However, no single study directly examines whether social influence has the power to influence environmentally friendly cycling habit behaviour. Likewise, psychological needs are more related to issuing behaviour intentions in general, but not in an environmentally friendly context.

2. Methodology

2.1 Hedonic Motivation and Environmentally Friendly Behaviour(EFB)

Prior research about hedonic motivation and EFB primarily discuss how hedonic motivation trigger purchase intention, especially in green product [8,18–20]. One of the research results concluded that environmental knowledge is essential to influencing purchase intention rather than ecological concern, but hedonic motivation did not[18]. Nevertheless, another research found that hedonic motivation affects green purchase intention behaviour in green apparel and green eating [19,20]. No one research discuss hedonic motivation in cycling. Still, one book chapter concerned hedonic motivation and health behaviour, especially green eating [21]. Based on the discussion above, the hypothesis of this study is **H1: hedonic motivation has a positive effect on EFB.**

2.2 Social Influence and Environmentally Friendly Behaviour(EFB)

Academic discussion about social influence and EFB was easily found in prior research[22–24]. Still, only one study discusses how to support the adoption of cycling for transportation[25] and mention that social-psychological behaviour change literature and mixed-method, the multi-stage approach can be applied to cycling programs. Based on this fact and suggestion from previous research about behaviour-based cycling promotion initiatives requiring further research attention, we propose the hypothesis of the **H2: social influence has a positive effect on EFB.**

2.3 Psychological Needs and Environmentally Friendly Behaviour(EFB)

Basic Psychological Needs Theory (BPNT) [11] is a well-known theory that gives scientific backbones about grasping the connection between the contextual social environment and a person's well-being and ill-being [26]. Based on BPNT, people who fulfilled essential psychological needs would reach optimal psychological well-being. Ryan and Deci (2000) explain that in the BPNT context, humans have fundamental psychological needs for competence, autonomy and relatedness. Prior research found that physical activity related to psychological needs has an overall direct relationship with well-being associated with cycling habits [27]. Furthermore, in another prior research, we found that extended TPB, which involves habit as a variable, will increase using cycling for transport and make the user more satisfied and enjoy. The condition makes the user more motivated and elevates their well-being [26,28], but does not examine the environmentally friendly motivation. So, there is a missing link between well-being conditions that affect cycling habits with environmentally friendly motivation. Based on the explanation above, we propose our last hypothesis, **H3: psychological needs positively affect EFB.**

So, the figure of the hypothesis development in proposed models in this research is as follows:
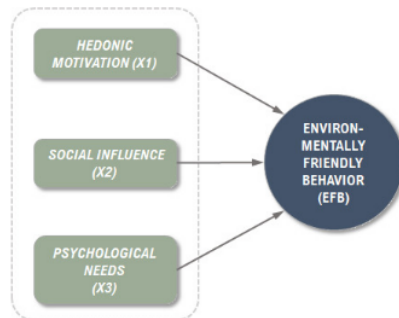
Figure 1. Research model

2.4 Research Subject

The subjects in this study were bicycle users in Yogyakarta as the population. The sample used a random sampling method. The sample used in the research is bicycle users who use their bicycles for transport and hobby purposes from November 22 until December 5, 2020.

2.5 Data Collection

Data using a questionnaire distributed to respondents was collected through a survey using google forms. The research instrument was taken from Chen (2019)'s prior research for the hedonic motivation variable [29] (6 questions). Social influence questionnaire adapted from Chen, Kaplan and Jahanshashi [29–31] (9 questions), psychological needs from Kaplan[30] (11 questions), and the dependent variables, EFB, which adopted the questionnaire from Gautam [32], which use five questions. The questionnaires were measured using a Likert scale with intervals of 1-5. The questionnaire was equally distributed among 235 respondents, and after filtering the data, the adequate sample size was 224. Figure 2 to Figure 5 shows the respondents characteristics in this research.
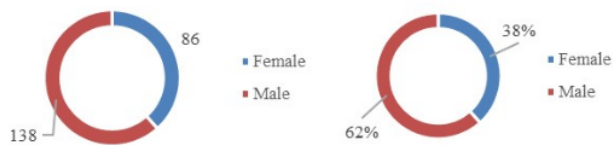
(a) number of respondents   (b) percentage of respondents
Figure 2. Respondent characteristics based on gender
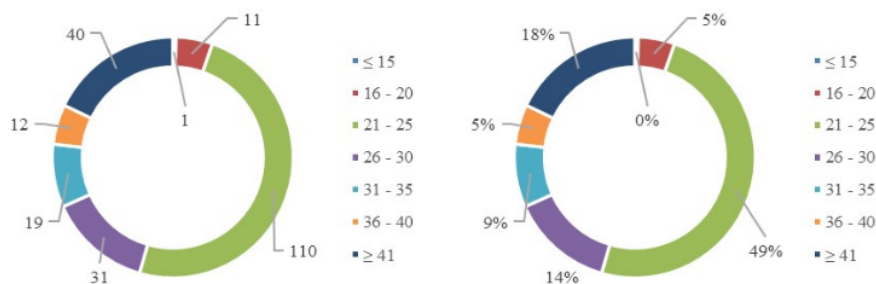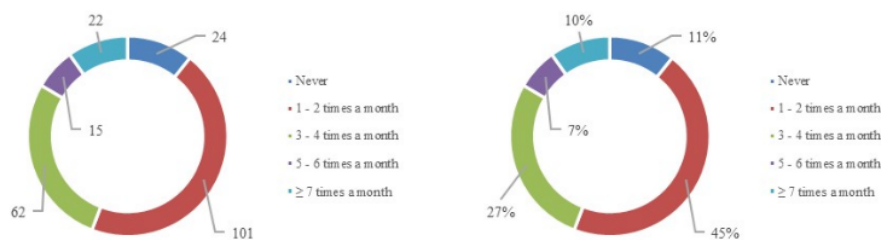

(a) number of respondents   (b) percentage of respondents
Figure 3. Respondent characteristic based on age

(a) number of respondents

(b) percentage of respondents

Figure 4. The possibilities to cycling during the Covid-19 Pandemic with friends/colleagues

(a) number of respondents

(b) percentage of respondents

Figure 5. The frequency of cycling with friends/colleagues during the Covid-19 Pandemic

2.6 Data Processing

SPSS 26.0 is used for analyzing data. Using Cronbach's alpha value, measuring validity and reliability was checked against each construct, as shown in Table 1. Multiple linear regression analysis was conducted to test the impact between independent and dependent variables in the following steps.

Table 1. The validity and reliability test

Construct	Items	Pearson Correlation	Cronbach Alpha	Construct	Items	Pearson Correlation	Cronbach Alpha	Construct	Items	Pearson Correlation	Cronbach Alpha
Hedonic Motivation	HM1	0.631**			SI1	0.624**			PN1	0.746**	
	HM2	0.672**			SI2	0.772**			PN2	0.800**	
	HM3	0.703**	0.663		SI3	0.760**			PN3	0.823**	
	HM4	0.658**			SI4	0.705**			PN4	0.764**	
	HM5	0.619**		Social Influence	SI5	0.770**	0.903	Psycho-logical Needs	PN5	0.834**	0.927
Environ-mentally Friendly Behavior	EFB1	0.742**			SI6	0.851**			PN6	0.864**	
	EFB2	0.861**			SI7	0.806**			PN7	0.830**	
	EFB3	0.923**	0.893		SI8	0.760**			PN8	0.808**	
	EFB4	0.898**			SI9	0.750**			PN9	0.684**	
	EFB5	0.764**							PN10	0.582**	
									PN11	0.672**	

** significant at 0.01

Based on table 1, we can see that all of the items in the instrument were valid and reliable. The next step is checking the classic assumption test for the research model. For example, there should not be any multicollinearity. This assumption is checked in SPSS with the variance inflation factor (VIF) and tolerance (1/VIF). Based on Table 2, there is no multicollinearity in our research model. A second assumption is heteroscedasticity. We were using the Glejser test for checking heteroscedasticity. Table 2 also shows no heteroscedasticity in our research model. Next, the Durbin-Watson test is done to

check the assumption of independent errors or a lack of autocorrelation. The Durbin-Watson test value is 2,031, which is between du 1.905 and 4-du at 2.094, and it means that the assumption has undoubtedly been met. The last assumption is the normality test, which the Kolmogorov-Smirnov test can check. The K-S test value is 0.200, above 0.05 as normality value standard, based on which it can be concluded that the errors are normally distributed. All the preliminary tests, as shown in Table 2 as follows:

Table 2. Multicollinearity, Heteroscedasticity, Autocorrelation, and Normality Test

Variable	Multicollinearity			Heteroscedasticity	
	standard		conclusion	standard	conclusion
	tolerance > 0.1	VIF <10		Sig >0.5 (ABS_Res)	
Hedonic Motivation	0.585	1.711	no multicollinierity	0.232	no heteroscedasticity
Social Influence	0.350	2.860	no multicollinierity	0.193	no heteroscedasticity
Psychological Needs	0.332	3.011	no multicollinierity	0.918	no heteroscedasticity
	Autocorrelation		One sample K-S normality test		
	standard	conclusion		standard	conclusion
du	1.90526			> 0.05	
Durbin Watson	2.03100	du<DW<4-du no autocorrelation	N	224	
4-du	2.09474		Asymp. Sig. (2-tailed)	0.200	test distribution is normal

[a] Predictors: (Constant), psychological need, hedonic motivation, social influence
[b] Dependent Variable: environmentally friendly behaviour

Based on Table 2, it was concluded that all assumptions for generalization have been met and sufficient to carry out hypothesis and model testing.

3. Discussion

Table 3 shows that hedonic motivation and psychological needs are significant and not social influences. The partial regression coefficients show the part of the variation caused in the dependent variable, environmentally friendly behaviour/EFB, by a one-unit change in the predicted variables, i.e., hedonic motivation, social influence, and psychological needs. The strongest predictor is the psychological needs ($\beta = 0.359$) of the EFB in cycling habit. The result in Table 3 shows that hedonic motivation and psychological needs positively affect the EFB, so we can conclude that hypotheses 1 and 3 are supported in this research. The model fit test examined by F-test found that the adjuster R-square 31.1% variation in the predicted variable, EFB, has been explained by the predictors. We can say that all predictors simultaneously predict the dependent variable with Sig. 0.000 at 34.629.

Table 3. T-test for Multiple Regression

	Unstandardized Coefficients		Standardized Coefficients	t	Sig.
	B	Std. Error	Beta		
(Constant)	9.949	1.048		9.496	0.000
hedonic motivation	0.140	0.069	0.148	2.032	0.043
social influence	0.059	0.047	0.119	1.271	0.205
psychological needs	0.150	0.040	0.359	3.727	0.000

[a] Dependent variable: Environmentally friendly behaviour

Research results found that the independent variables, which sources from internal motivation, are more controllable to develop environmentally friendly perspectives that will support somebody concerning environmental habit, especially in cycling behaviour. The Self-Determination Theory explains that inner motivation can form the well-being standard and increase self-efficacy related to individual competencies in BPNT. This study also found that social influence cannot be a single driver affecting EFB. Self-Determination Theory shows that the approach to human motivation and personality uses traditional empirical methods. Furthermore, it employs an organismic metatheory. The theory highlights the importance of humans' evolved inner resources for personality development. This finding also highlights behavioural self-regulation works in this research [11,12,26].

4. Conclusions
The research result found that behavioural self-regulation is motivated by the fulfilment of psychological needs empirically proven. This finding contributes to showing that psychological needs appear to facilitate optimal functioning of the natural propensities for growth and integration of constructive social development and personal well-being. Especially in cycling behaviour, it can be the source of the internal motivation influenced by the need for relatedness or autonomy as part of BPNT. Fulfilling essential psychological needs also implies a eudaimonia situation, making it more possible to engage with environmentally friendly behaviour. Even though this research did not prove the social influence variable through environmentally friendly behaviour, this research should be continued by taking a larger sample and seeking the most related variable which contributes the fittest research model of environmentally friendly behaviour.

5. References
[1]   Amalia L, Irwan I and Hiola F 2020 Analisis Gejala Klinis Dan Peningkatan Kekebalan Tubuh Untuk Mencegah Penyakit Covid-19 *Jambura J. Heal. Sci. Res.* **2** 71–6

[2]   Ittaqullah N, Madjid R and Suleman NR 2020 The effects of mobile marketing, discount, and lifestyle on consumers' impulse buying behaviour in online marketplace *Int. J. Sci. Technol. Res.* **9** 1569–77

[3]   Sun Y, Du Y, Wang Y and Zhuang L 2017 Examining associations of environmental characteristics with recreational cycling behaviour by street-level strava data *Int. J. Environ. Res. Public Health* **14**

[4]   Bird E L, Panter J, Baker G, Jones T and Ogilvie D 2018 Predicting walking and cycling behaviour change using an extended Theory of Planned Behaviour *J. Transp. Heal.* **10** 11–27

[5]   Zhao P, Li S, Li P, Liu J and Long K 2018 How does air pollution influence cycling behaviour? Evidence from Beijing *Transp. Res. Part D Transp. Environ.* **63** 826–38

[6]   Grønhøj A and Thøgersen J 2017 Why young people do things for the environment: The role of parenting for adolescents' motivation to engage in pro-environmental behaviour *J. Environ. Psychol.* **54** 11–9

[7]   Testa F, Pretner G, Iovino R, Bianchi G, Tessitore S and Iraldo F 2021 *Drivers to green consumption: a systematic review* vol 23 (Springer Netherlands)

[8]   Putri W H, Setianan A R and Puspitasari D 2021 Aligning Tax Incentives and Purchasing Behavior for Consumers of Environment-Friendly Products *Proc. 3rd Int. Conf. Banking, Accounting, Manag. Econ. (ICOBAME 2020)* **169** 207–12

[9]   Ajzen I 1991 *The Theory of Planned Behavior* vol 50

[10]   Ajzen I 2011 The theory of planned behaviour: Reactions and reflections *Psychol. Heal.* **26** 1113–27

[11]   Ryan, R. M., & Deci E L 2000 Self-determination theory and the facilitation of intrinsic motivation, social development, and well-being. American Psychologist, 55(1), 68–78. doi:10.1037/0003-066x.55.1.68 *Am. Psychol.* **55** 68–78

[12]   Ryan R M and Deci E L 2000 Self-determination theory. Encyclopedia of quality of life and well-being research *Am. Psychol.* 68–78

[13]   White K, Habib R and Hardisty D J 2019 How to SHIFT consumer behaviours to be more sustainable: A literature review and guiding framework *J. Mark.* **83** 22–49

[14]   Nienhuis C P and Lesser I A 2020 The impact of COVID-19 on physical activity behaviour and well-being *Int. J. Environ. Res. Public Health* **17** 1–12

[15]   Ryan R M and Martela F 2016 Eudaimonia as a Way of Living: Connecting Aristotle with Self-Determination Theory *Handbook of Eudaimonic Well-Being, International Handbooks of Quality-of-Life* (Springer International Publishing) pp 109–22

[16]   Haybron D M 2008 *The Pursuit of Unhappiness; The elusive psychology of well-being* (Oxford University Press)

[17]   Vittersø J 2016 The Most Important Idea in the World: An Introduction *Handbook of Eudaimonic Well-Being, International Handbooks of Quality-of-Life* (Springer International Publishing) pp 1–24

[18]   Choi D and Johnson K K P 2019 Influences of environmental and hedonic motivations on intention to purchase green products: An extension of the theory of planned behaviour *Sustain. Prod. Consum.* **18** 145–55

[19]   Kumar S and Yadav R 2021 The impact of shopping motivation on sustainable consumption: A study in the context of green apparel *J. Clean. Prod.* **295** 126239

[20]   Chen Y, Lee B-F and Lu Y-C 2021 Fitnesser's Intrinsic Motivations of Green Eating: An Integration of Theory of Planned Behavior and Hedonic Motivation System Adoption Model *Front. Psychol.* **12**

[21]   Williams D 2018 Psychological Hedonism, Hedonic Motivation, and Health Behavior.Affective Determinants of Health Behavior *Affective Determinants of Health Behavior* p 204

[22]   Mishal A, Dubey R, Gupta O K and Luo Z 2017 Dynamics of environmental consciousness and green purchase behaviour: an empirical study *Int. J. Clim. Chang. Strateg. Manag.* **9** 682–706

[23]   Bedard S A N and Tolmie C R 2018 Millennials' green consumption behaviour: Exploring the role of social media *Corp. Soc. Responsib. Environ. Manag.* **25** 1388–96

[24]   Liao B, Li L and Yang Z 2021 Perceived social green preference: the motivation mechanism of inducing green behaviour *Curr. Psychol.*

[25]   Savan B, Cohlmeyer E and Ledsham T 2017 Integrated strategies to accelerate the adoption of cycling for transportation *Transp. Res. Part F Traffic Psychol. Behav.* **46** 236–49

[26]   Gunnell K E, Crocker P R E, Wilson P M, Mack D E and Zumbo B D 2013 Psychological need satisfaction and thwarting: A test of Basic Psychological Needs Theory in physical activity contexts *Psychol. Sports Exerc.* **14** 599–607

[27]   Gunnell K E, Mack D E, Wilson P M and Adachi J D 2011 Psychological needs as mediators? The relationship between leisure-time physical activity and well being in people diagnosed with osteoporosis *Res. Q. Exerc. Sport* **82** 794–8

[28]   Vlachopoulos S P, Karageorghis C I and Terry P C 2000 Motivation profiles in sport: A self-determination theory perspective *Res. Q. Exerc. Sport* **71** 387–97

[29]   Chen L H and Chancellor H C 2020 Examining the leisure use of a bicycle share program: A case study of YouBike in Taipei *J. Leis. Res.* **51** 183–205

[30]   Kaplan S, Wrzesinska D K and Prato C G 2019 Psychosocial benefits and positive mood related to habitual bicycle use *Transp. Res. Part F Traffic Psychol. Behav.* **64** 342–52

[31]   Jahanshahi D, Tabibi Z and van Wee B 2020 Factors influencing the acceptance and use of a bicycle sharing system: Applying an extended Unified Theory of Acceptance and Use of Technology (UTAUT) *Case Stud. Transp. Policy* **8** 1212–23

[32]   Gautam V 2020 Examining environmental friendly behaviours of tourists towards sustainable development *J. Environ. Manage.* **276** 111292

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