

# Theory of Planned Behavior in Energy-Saving Behaviors

Subjects: Behavioral Sciences

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People with physical impairments can help solve energy problems by participating in diverse energy-saving behaviors, such as switching off lights or turning off an air conditioner when not in use; however, they may struggle to participate in some behaviors due to mobility impairments. An energy-saving behavior is an individual action that aims to reduce energy consumption and the negative environmental impacts of energy consumption and production. The theory of planned behavior (TPB), which was proposed by Ajzen in 1985, is an extension of the theory of reasoned action (TRA).

Keywords: the theory of planned behavior ; perceived behavioral control ; attitude towards behaviors

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## 1. Introduction

Energy production and consumption contribute significantly to climate change <sup>[1][2]</sup>, which is now considered a global environmental crisis. Solving this energy crisis requires the participation of all sectors, including business, agriculture, transportation, governments, and households, as well as of individuals. Individual participation in energy-saving behaviors is crucial, as it can reduce energy demand and minimize the adverse environmental impacts of energy production and consumption <sup>[3][4]</sup>. People can adopt energy-saving behaviors in various ways, including using energy-efficient appliances, implementing energy-efficient measures in buildings, adopting renewable energy sources and technologies, and practicing energy-reducing behaviors <sup>[5]</sup>. Jareemit and Limmeechokchai <sup>[6]</sup> reveal that participation in energy-saving behaviors could help reduce annual household energy use by 7–15%, or 484–1038 kWh. Furthermore, Steg <sup>[7]</sup> finds that the active engagement of individuals in SEBs helps to reduce CO<sub>2</sub> emissions.

Currently, energy-saving behaviors are being widely promoted to solve energy-related problems. Many previous studies have explored strategies to enhance individual participation in energy-saving behaviors, but most of these focus on the participation of individuals with normal physical bodies <sup>[7][8][9]</sup>. However, people with physical impairments can also participate in energy-saving behaviors, and their participation in these behaviors can contribute to a great amount of energy saved. According to the World Health Organization <sup>[10]</sup>, approximately 15% of the world's population, or one billion people, experience some form of disability. In Thailand, there were approximately 2.1 million disabled people in 2021 <sup>[11]</sup>, and half of this number (1,054,786) had physical impairments. Most importantly, the number of physically disabled people in Thailand is increasing due to the rise in the average age of the population and chronic health conditions. Therefore, the participation of people with physical impairments could significantly contribute to solving energy problems. Aside from contributing to solving the energy problem, promoting participation in energy-saving behaviors by people with physical impairments also enhances their self-esteem, as they could perceive their value to society.

However, physical impairments could hinder people from participating in energy-saving behaviors due to limited physical capacity and dexterity. For instance, the interior of buildings might not be designed so that people with physical impairments can conveniently access electrical appliances. People with physical impairments, therefore, need to make more effort to participate in energy-saving behaviors that require physical movements. These include turning off lights, switching off electrical devices, and unplugging appliances. As a result, the determinants of energy-saving behavior participation among people with physical impairments could differ from those among people without physical impairments.

Subjective norms are related to social cohesion <sup>[12]</sup> and can be defined as how given behaviors are perceived by other people who are important to an individual. Individuals tend to adopt a behavior if they perceive that participation in that behavior is socially accepted. Attitude towards the behavior refers to one's perception of the value of the behavior. Individuals with positive attitudes towards a behavior are more likely to intend to participate in the behavior. Perceived behavioral control refers to an individual's level of comfort with a particular behavior. In other words, behavioral control is an individual's perception of the availability of resources, capability, and opportunities to participate in a particular behavior <sup>[13]</sup>. Individuals with a high level of behavioral control tend to engage in a given behavior. The TPB also states that

behavioral control can directly affect participation in a behavior, and having both behavioral control and intentions concurrently, individuals can easily decide to engage in the behaviors. The TPB has been successfully applied to explain decisions to engage in various behaviors, including green purchasing behaviors <sup>[14][15]</sup>, water conservation behaviors <sup>[16][17]</sup>, waste management behaviors <sup>[18][19]</sup>, and energy-saving behaviors <sup>[9][20][21]</sup>. Therefore, this research employs the TPB to investigate participation in energy-saving behaviors by students with physical impairments.

## **2. Energy-Saving Behaviors**

An energy-saving behavior is an individual action that aims to reduce energy consumption and the negative environmental impacts of energy consumption and production <sup>[22]</sup>. Most energy-saving behaviors are performed in the residential sector. Several scholars suggest how individuals can participate in energy-saving behaviors in the residential sector. Firstly, individuals may adopt energy-efficient behaviors <sup>[23]</sup>, including using energy-efficient appliances (including light bulbs and large appliances) and efficient use of electricity (such as cleaning electrical appliances to improve their efficiency or adjusting the temperature of air conditioners). Steg et al. <sup>[5]</sup> indicate that switching to energy-efficient appliances can significantly reduce household energy consumption. Secondly, individuals can reduce energy use through two types of electricity-consumption reduction behaviors. The first type is curtailment behaviors, which include reducing the length of showers, turning off lights when not in use, and unplugging appliances <sup>[23]</sup>. The second type is avoidance activities; these involve avoiding high-energy activities, such as drying laundry in a machine and showering in hot water <sup>[24]</sup>. Steg et al. <sup>[7]</sup> indicate that adopting or switching to energy-efficient technology can reduce energy use and CO<sub>2</sub> emissions more effectively than energy consumption reduction behaviors. However, the frequency of behaviors is also important. Zografakis et al. <sup>[25]</sup> argue that to successfully reduce electrical consumption, individuals must make lifestyle changes.

## **3. Theory of Planned Behavior**

The TPB, which was proposed by Ajzen in 1985 <sup>[26]</sup>, is an extension of the theory of reasoned action (TRA) <sup>[27][28]</sup>. Both models explain that an individual's decision to engage in a certain behavior is based on logical and reasoned thought processes. According to the TPB, a behavior is directly determined by an individual's intention to engage in it, and intention is influenced by the way that an individual perceives the value of the behavior (attitude towards the behavior) <sup>[29]</sup>, how significant others in the individual's life view or think about the behavior (subjective norms), and the perception that the certain behavior is within the individual's control (perceived behavioral control) <sup>[13]</sup>. Three significant factors that could affect behavioral intention and behavior are discussed in the subsections below.

### **3.1. Attitude towards the Behavior**

Individuals construct behavioral beliefs based on their evaluation of the concerned behavior. These behavioral beliefs and attitudes can be favorable or unfavorable <sup>[30]</sup>. Individuals with a positive attitude towards a behavior are more likely to intend to perform the behavior.

### **3.2. Subjective Norms**

According to the TPB, if individuals believe that important people in their life would approve of a certain behavior, they are more likely to intend to engage in the behavior. Nugier et al. <sup>[30]</sup> state that social influence or social pressure could induce negative moral emotions such as embarrassment, shame, and guilt. These emotions could affect an individual's intention to perform a certain behavior.

### **3.3. Perceived Behavioral Control**

Perceived behavioral control is generated from an individual's belief that they have sufficient resources, capability, and opportunities to perform a given behavior. According to Ajzen <sup>[12]</sup>, perceived behavioral control refers to an individual's judgement of the ease or difficulty of participating in a particular behavior. Similarly, Abrahamse <sup>[31]</sup> defines perceived behavioral control as an individual's assessment of the factors that might facilitate or impede a certain behavior. Based on the TPB, perceived behavioral control can directly influence behavioral intention. Namely, individuals with high perceived behavioral control may have more intentions to participate in a certain behavior than those with low perceived behavioral control. Most importantly, individuals who intend to perform a certain behavior, and concurrently have perceived behavioral control, are likely to participate in a certain behavior. For instance, individuals with the same level of intention to engage in a behavior might have different levels of engagement due to different levels of perceived behavioral control. Similarly, an individual's intention might not result in a behavior due to a lack of perceived behavioral control.

In sum, it can be concluded that perceived behavioral control, together with subjective norms and attitudes toward the behavior, can directly influence intentions. Perceived behavioral control and intentions then determine behavior. Previous studies have used TPB to explain an individual's participation in a variety of behaviors, including health behaviors [32], resource conservation [33][34], and safe environmental practices [35][36][37][38].

## References

1. United State Environmental Protection Agency (EPA). Inventory of U.S. Greenhouse Gas Emissions and Sinks 1990–2019; EPA 430-R-21-005; The Environmental Protection Agency: Washington, DC, USA, 2021; p. 20460.
2. Eurostat. Air Emissions Accounts by NACE Rev. 2 Activity. Available online: [https://appsso.eurostat.ec.europa.eu/nui/show.do?dataset=env\\_ac\\_ainah\\_r2&lang=en](https://appsso.eurostat.ec.europa.eu/nui/show.do?dataset=env_ac_ainah_r2&lang=en) (accessed on 10 March 2021).
3. Pawlik, K.; Steg, L.; Sood, A. Psychological Approaches and Contributions to Global Environmental Change. In World Social Science Report; OECD: Paris, France, 2013.
4. Steg, L.; Perlaviciute, G.; Van der Werff, E.; Lurvink, J. The significance of hedonic values for environmentally relevant attitudes, preferences, and actions. *Environ. Behav.* 2014, 46, 163–192.
5. Steg, L.; Perlaviciute, G.; van der Werff, E. Understanding the human dimensions of a sustainable energy transition. *Front. Psychol.* 2015, 6, 805.
6. Jareemit, D.; Limmeechokchai, B. Impact of homeowner's behaviours on residential energy consumption in Bangkok, Thailand. *J. Build. Eng.* 2019, 21, 328–335.
7. Steg, L.; Shwom, R.; Dietz, T. What drives energy consumers?: Engaging people in a sustainable energy transition. *IEEE Power Energy Mag.* 2018, 16, 20–28.
8. Hien, N.N.; Chi, P.H. The factors affecting household electricity saving behavior: A study in Vietnam. *Int. J. Sustain. Dev. Plan.* 2020, 15, 1241–1250.
9. Du, J.; Pan, W. Examining energy saving behaviors in student dormitories using an expanded theory of planned behavior. *Habitat Int.* 2021, 107, 102308.
10. World Health Organization (WHO). World Report on Disability. Available online: <https://www.who.int/teams/noncommunicable-diseases/disability-and-rehabilitation/world-report-on-disability> (accessed on 5 September 2021).
11. Department of Empowerment of Persons with Disabilities, Ministry of Social Development and Human Security, Thailand. Available online: <http://web1.dep.go.th/?q=en/home> (accessed on 5 September 2021).
12. Bernhard, H.; Fischbacher, U.; Fehr, E. Parochial Altruism in Humans. *Nature* 2006, 442, 912–915.
13. Ajzen, I. The theory of planned behavior. *Organ. Behav. Hum. Decis. Process.* 1991, 50, 179–211.
14. Ho, S.S.; Liao, Y.; Rosenthal, S. Applying the theory of planned behavior and media dependency theory: Predictors of public pro-environmental behavioral intentions in Singapore. *Environ. Commun.* 2014, 9, 77–99.
15. Müller, J.; Acevedo-Duque, Á.; Müller, S.; Kalia, P.; Mehmood, K. Predictive Sustainability Model Based on the Theory of Planned Behavior Incorporating Ecological Conscience and Moral Obligation. *Sustainability* 2021, 13, 4248.
16. Drescher, M.; Sinasac, S. Social-psychological determinants of the implementation of green infrastructure for residential stormwater management. *Environ. Manag.* 2020, 67, 308–322.
17. Prayoga, R.; Nastiti, A.; Schindler, S.; Kusumah, S.; Sutadian, A.; Sundana, E.; Simatupang, E.; Wibowo, A.; Budiwanto, B.; Sedighi, M. Perceptions of drinking water service of the 'off-grid' community in Cimahi, Indonesia. *Water* 2021, 13, 1398.
18. Ertz, M.; Favier, R.; Robinot, E.; Sun, S. To waste or not to waste? Empirical study of waste minimization behavior. *Waste Manag.* 2021, 131, 443–452.
19. Abadi, B.; Mahdavian, S.; Fattahix, F. The waste management of fruit and vegetable in wholesale markets: Intention and behavior analysis using path analysis. *J. Clean. Prod.* 2021, 279, 123802.
20. Liu, X.; Wang, Q.C.; Jian, I.Y.; Chi, H.L.; Yang, D.; Chan, E.H.W. Are you an energy saver at home? The personality insights of household energy conservation behaviors based on theory of planned behavior, *Resources. Conserv. Recycl.* 2021, 174, 105823.
21. Wang, Q.C.; Chang, R.; Xu, Q.; Liu, X.; Jian, I.Y.; Ma, Y.T.; Wang, Y.X. The impact of personality traits on household energy conservation behavioral intentions—An empirical study based on theory of planned behavior in Xi'an. *Sustain. Energy Technol. Assess.* 2021, 43, 100949.

22. Sony, M.; Mekoth, N.A. Qualitative study on electricity energy-saving behaviour. *Manag. Environ. Qual. Int. J.* 2018, 29, 961–977.
23. Trotta, G. Factors affecting energy-saving behaviours and energy efficiency investments in British households. *Energy Policy* 2018, 114, 529–539.
24. Huber, J. Towards industrial ecology: Sustainable development as a concept of ecological modernization. *J. Environ. Policy Plan.* 2000, 2, 269–285.
25. Zografakis, N.; Menegaki, A.N.; Tsagarakis, K.P. Effective education for energy efficiency. *Energy Policy* 2016, 36, 3226–3232.
26. Ajzen, I. From intentions to actions: A theory of planned behavior. In *Action Control*; Springer: Berlin/Heidelberg, Germany, 1985; pp. 11–39.
27. Fishbein, M.; Ajzen, I. *Belief, Attitude, Intention, and Behavior: An Introduction to Theory and Research*; Addison-Wesley: Reading, MA, USA, 1975.
28. Ajzen, I.; Fishbein, M. *Understanding Attitudes and Predicting Social Behavior*; Prentice-Hall: Englewood Cliffs, NJ, USA, 1980.
29. Webb, D.; Soutar, G.N.; Mazzarol, T.; Saldaris, P. Self-determination theory and consumer behavioural change: Evidence from a household energy-saving behaviour study. *J. Environ. Psychol.* 2013, 35, 59–66.
30. Nugier, A.; Niedenthal, P.; Brauer, M.; Chekroun, P. Moral and angry emotions provoked by informal social control. *Cogn. Emot.* 2007, 2, 1699–1720.
31. Abrahamse, W. Chapter 2—Understanding the Drivers of Human Behavior; Abrahamse, W., Ed.; *Encouraging pro-environmental behavior*; Academic Press: San Diego, CA, USA, 2019.
32. Moan, I.S.; Rise, J. Quitting Smoking: Applying an Extended Version of the Theory of Planned Behavior to Predict Intention and Behavior. *J. Appl. Biobehav. Res.* 2005, 10, 39–68.
33. Gibson, K.E.; Lamm, A.J.; Woosnam, K.M.; Croom, D.B. Predicting Intent to Conserve Freshwater Resources Using the Theory of Planned Behavior (TPB). *Water* 2021, 13, 2581.
34. Chaudhary, A.K.; Warner, L.; Lamm, A.; Israel, G.; Rumble, J.; Cantrell, R. Using the theory of planned behavior to encourage water conservation among extension clients. *J. Agric. Educ.* 2017, 58, 185–202.
35. Schaffner, D.; Ohnmacht, T.; Weibel, C.; Mahrer, M. Moving into energy-efficient homes: A dynamic approach to understanding residents' decision-making. *Build. Environ.* 2017, 123, 211–222.
36. Greaves, M.; Zibarras, L.D.; Stride, C. Using the theory of planned behavior to explore environmental behavioral intentions in the workplace. *J. Environ. Psychol.* 2013, 34, 109–120.
37. Yurieva, A.; Dahmena, M.; Paillé, P.; Boirala, O.; Guillaumieb, L. Pro-environmental behaviors through the lens of the theory of planned behavior: A scoping review. *Resour. Conserv. Recycl.* 2020, 155, 104660.
38. Yang, X.; Chen, L.; Wei, L.; Su, Q. Personal and Media Factors Related to Citizens' Pro-environmental Behavioral Intention against Haze in China: A Moderating Analysis of TPB. *J. Environ. Res. Public Health* 2020, 17, 2314.

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