

*Millenium*, 2(14), 71-78.

en

**PESSOAS DE BAIXA RENDA E COMPORTAMENTO PRÓ-AMBIENTAL: PARA ALÉM DAS QUESTÕES FINANCEIRAS,  
UMA REVISÃO DE LITERATURA**

**LOW-INCOME PEOPLE AND PRO-ENVIRONMENTAL BEHAVIOR: BEYOND MONEY ISSUES, A LITERATURE REVIEW**

**PERSONAS DE BAJOS INGRESOS Y COMPORTAMIENTO PROAMBIENTAL: MÁS ALLÁ DE LOS PROBLEMAS DE  
DINERO, UNA REVISIÓN DE LITERATURA**

*Maria Augusta Ferreira<sup>1</sup>*

*Suely Santana<sup>1</sup>*

<sup>1</sup> Universidade Católica de Pernambuco, Recife, Brasil

Maria Augusta Ferreira - mariaferreira@gmail.com | Suely Santana - suely.santana@unicap.br



---

**Corresponding Author**

*Maria Augusta Ferreira*

Universidade Católica de Pernambuco  
R. do Príncipe, 526 - Boa Vista  
Recife - PE, 50050-900, Brasil  
mariaferreira@gmail.com

RECEIVED: 28<sup>th</sup> April, 2020

ACCEPTED: 12<sup>th</sup> October, 2020

## RESUMO

**Introdução:** A pobreza e os problemas ambientais são duas das principais preocupações que a humanidade enfrenta na busca por uma melhor qualidade de vida.

**Objetivo:** Relacionar sob uma perspectiva da psicologia e da gestão ambiental, a pobreza com o comportamento pró-ambiental das pessoas de baixa renda.

**Métodos:** Foi realizada uma revisão de literatura. A busca dos artigos a serem revisados considerou três critérios principais: 1. os artigos foram relacionados com um determinado tipo de comportamento pró-ambiental em um contexto específico e possuem uma abordagem de gestão ambiental; 2. pessoas de baixa renda foram o foco central da pesquisa, não apenas mais um critério sociodemográfico; 3. os artigos foram baseados em uma das duas principais teorias psicológicas aplicadas à gestão ambiental e ao comportamento pró-ambiental, a teoria social cognitiva e a teoria do comportamento planeado.

**Resultados:** Os onze artigos analisados compartilham a conclusão de que fatores psicológicos - especialmente a autoeficácia - contribuem para uma melhor compreensão das possibilidades e impedimentos para pessoas de baixa renda praticarem comportamentos pró-ambientais.

**Conclusão:** Os artigos vão além da análise óbvia relacionada à renda, que reduz a problemática a uma questão de dinheiro/renda. Eles contribuem significativamente para o aprimoramento da gestão e políticas ambientais capazes de incluir pessoas de baixa renda na ação global em favor da natureza.

**Palavras-chaves:** baixa renda; comportamento pró-ambiental; autoeficácia

## ABSTRACT

**Introduction:** Poverty and environmental problems are two major concerns humanity is facing in its pursuit for a better quality of life.

**Objective:** Relate, from a perspective of psychology and environmental management, poverty with the pro-environmental behavior of low-income people.

**Methods:** A literature review was carried out. The search for articles to be reviewed considered three main criteria: 1. the articles are related to a certain kind of pro-environmental behavior in a specific context, and have an environmental management approach; 2. low-income people are the central focus of the research, not just another sociodemographic aspect; 3. the articles are based on one of the two main psychological theories applied to environmental management and pro-environmental behavior, Social Cognitive Theory and Theory of Planned Behavior.

**Results:** The eleven articles analyzed share the conclusion that psychological factors – especially self-efficacy – contribute to a better understanding of the possibilities and impediments for low-income people to practice pro-environmental behavior.

**Conclusion:** These articles go beyond the obvious income-related analysis that limits the problematic to a money/income issue. They significantly contribute to the improvement of environmental management and policies that are able to include low-income people in the common effort to preserve nature.

**Key Words:** low-income; pro-environmental behavior; self-efficacy

## RESUMEN

**Introducción:** La pobreza y los problemas ambientales son dos preocupaciones principales que enfrenta la humanidad en su búsqueda de una mejor calidad de vida.

**Objetivo:** Relacionar estos dos temas al revisar la literatura sobre personas de bajos ingresos y su comportamiento pro ambiental desde una perspectiva psicológica y de gestión ambiental.

**Métodos:** En la búsqueda de los artículos que se iban a revisar se tuvieron en cuenta tres criterios principales: 1. los artículos están relacionados con un cierto tipo de comportamiento pro ambiental en un contexto específico y tienen un enfoque de gestión ambiental; 2. las personas de bajos ingresos son el foco central de la investigación, no solo otro aspecto sociodemográfico; 3. los artículos se basan en una de las dos principales teorías psicológicas aplicadas a la gestión ambiental y el comportamiento pro ambiental, la teoría cognitiva social y la teoría del comportamiento planificado.

**Resultados:** Los once artículos analizados comparten la conclusión de que los factores psicológicos, especialmente la autoeficacia, contribuyen a una mejor comprensión de las posibilidades e impedimentos para que las personas de bajos ingresos practiquen un comportamiento pro ambiental.

**Conclusión:** Los artículos van más allá del análisis relacionado con los ingresos, que socava la problemática de un problema de dinero. Ellos, contribuyen significativamente a la mejora de las políticas que pueden incluir a las personas de bajos ingresos en el esfuerzo por preservar la naturaleza.

**Palabras Clave:** bajos ingresos; comportamiento proambiental; autoeficacia

## INTRODUCTION

The environmental degradation caused by human behavior has been an important concern to psychology science in recent years, especially in an interdisciplinary effort with management and policies approaches (Clayton et al., 2016). Another great concern for the human being is the fast-growing inequality and poverty related to environmental problems that harm mainly the poor and most vulnerable (Kibert, 2018). From a psychological viewpoint it is important to go beyond prejudice and to examine the relations between poverty and environmental impact, poor people's pro-environmental behavior, beyond money related issues. This also means to consider that poor people are the most vulnerable to environmental impact and with better management policies they are able to participate in the efforts to protect the environment, for themselves and for everybody else.

This article is a literature review about the psychology applied to low-income people and pro-environmental behavior (PEB). The articles reviewed are recent, from the last five years, and they are about field research relating PEB and low-income people. Low-income people are the sole subjects, the participants focused in the research, and the persons' income is not just one more sociodemographic variable. Besides, the articles base their research on Albert Bandura's Social Cognitive Theory (SCT), or on Ajzen's Theory of Planned Behavior (TPB). These two theories are different but share the use of the same self-efficacy construct as one of their bases for behavior prediction. Likewise, they have in common their focus on cognitive and behavioral aspects to explain and predict human behavior. The PEBs researched by the articles are in a variety of issues, such as energy conservation - that includes either saving energy overall or renewable energy, recycling, and green consumption.

The articles reviewed also conclude that psychological factors interfere in environmental behavior performance, and therefore should be used to develop and improve environmental management policies. They point out the importance of income but also the importance of psychological factors, especially self-efficacy, to the design of public policies that address environmental issues. Their perspective is to improve policies related to environmental issues, especially to look for approaches that go beyond revenue, targeting psychological aspects of pro-environmental behavior, their impediments and possibilities, not having a biased viewpoint. The analysis of the possibilities and impediments for low-income people to preserve nature is important because it has to do with both nature and its preservation and with social justice. Social justice here means finding ways not to burden low-income people more, understanding their struggles without neglecting the necessity and the possibilities for all to preserve nature and have a better quality of life.

## 1. REVIEW OF THE LITERATURE

This article reviews the literature, articles based on two core psychological theories commonly used in environmental management and psychology, the Social Cognitive Theory (SCT) by Albert Bandura and the Theory of Planned Behavior (TPB) by Ajzen. The articles must have been analyzing the determinants of the PEB using at least one construct of these theories. The two theories, SCT and TPB, were chosen because of their broad application in many different issues of environmental management, different kinds of pro-environmental behavior. They work with the prediction of behavior, in a cognitive and behavioral approach, and they also have in common the use of self-efficacy construct, that has a central role in the prediction of pro-environmental behavior.

Albert Bandura's Social Cognitive Theory is based on the triadic reciprocal model. This model states that human behavior, personal factors and environment, all three interact and influence each other (Bandura, 1986). Bandura's theory is based on the human agency concept. This concept asserts that human beings have power over what they do. The self-efficacy construct is pivotal to the human agency idea and means the belief of a person about his or her capability to drive a course of action in order to achieve certain results (Bandura, 1997). The SCT is widely used as a theory that can help understand pro-environmental behavior (Ardoín, Heimlich, Braus, & Merrick, 2013; M.-F. Chen, 2015).

The theory of Planned Behavior (TPB) works with three major constructs in order to predict human behavior: attitudes, social norms and perceived behavior control. The TPB first was called theory of Reasoned Action (RA), and with the addition of the perceived behavior control it received the new name TPB (Ajzen, 1991). But still, some authors use the two terms to refer to the same theory (Behbehani & Prokopy, 2017).

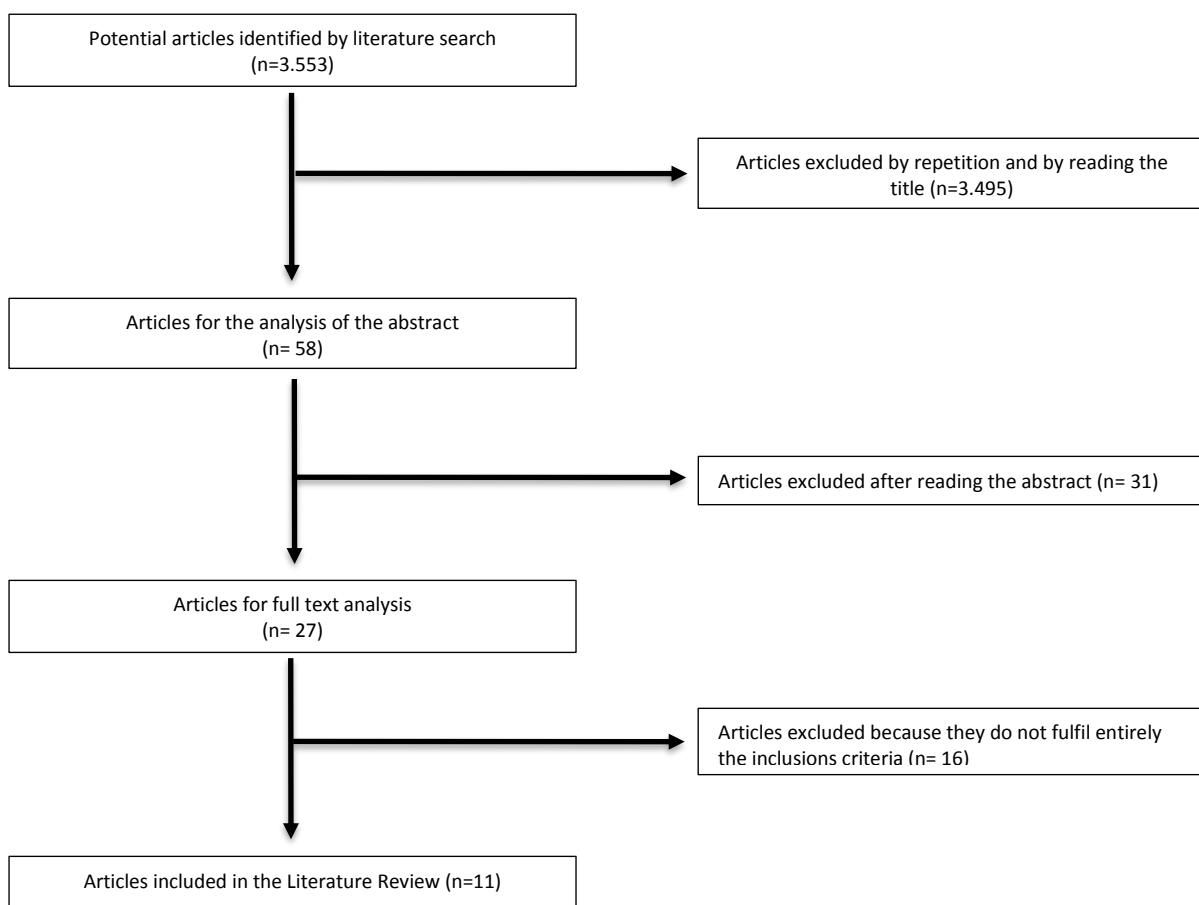
According to TPB, attitudes deal with the favourability or unfavourability of a certain behavior, the attachments, and the values that a person places in the behavior. The social norm is the value that society adds to a certain behavior and it comes to have importance for the person because of the social pressure to perform the behavior. Perceived Behavioral Control (PBC) is the perception that a person has about his or her capacity to perform a behavior in order to attain the desired outcome (Ajzen, 2002). As one can see the PBC has the same definition as self-efficacy, and Ajzen affirms he bases his understanding of self-efficacy on Bandura and his associates' research, and that the two constructs "are quite similar" at a certain point he uses both as the same (Ajzen, 1991). Most articles use self-efficacy, and also as the same as PBC, but four of them use these two constructs separately (Al Mamun, Fazal, et al., 2018; Al Mamun, Masud et al., 2019; Al Mamun, Mohamad, et al., 2018; Al Mamun, Mohiuddin, et al., 2018)

Similar to SCT, TPB is also applied in different issues and countries in environmental management. There are various examples of research articles and literature review that point out the use of TPB for predicting pro-environmental behavior (Ardoín et al., 2013; Ding et al., 2018; Yuriev, Dahmen, Paillé, Boiral, & Guillaumie, 2020).

## 2. METHODS

The review was performed based on these three common scientific databases - Web of Science, Science Direct and APA PsycNet. The research was conducted first from November 2018 to May 2019, and as final period, in March and June 2020. The articles are peer reviewed and were published in the last five years. This review targeted only empirical studies. The studies must address all three different issues: low income people, pro-environmental behavior, and at least one of the two psychological theories, SCT or TPB. These are descriptors for search: (low income OR low class OR base of pyramid OR poverty OR social) AND (pro-environmental behavior OR sustainable OR environmental management OR energy OR water OR recycling OR environment) AND (self-efficacy OR perceived behavioral control OR Ajzen OR Bandura OR psycholog\*/psychological).

The search is described in the Figure 1. Few articles (eleven) were found. Despite having many results, the articles did not precisely match the criteria for this analysis due to these reasons: either the low-income issue was not central to the article research, but rather just another socio-demographic factor, the theories were not exactly applied as pivotal to the article, or it was not about pro-environmental behavior specifically but about environmental policies in general. The final result was 11 articles (Al Mamun, Fazal, et al., 2018; Al Mamun et al., 2019; Al Mamun, Mohamad, et al., 2018; Al Mamun, Mohiuddin, et al., 2018; Behbehani & Prokopy, 2017; Boomsma, Jones, Pahl, & Fuertes, 2019; C. Chen, Xu, & Day, 2017; Hafner, Pahl, Jones, & Fuertes, 2020; Russell-Bennett, Mulcahy, Little, & Swinton, 2018; Wamuyu, 2018; Zhao, Cavusgil, & Zhao, 2016) that match exactly the criteria and are able to be analyzed in this review.



**Figure 1** - Articles selection process, steps and numbers

## 3. RESULTS AND DISCUSSION

The use of the two theories SCT and TPB to predict PEB are spread throughout the world and in various kind of PEB, as discussed above. The point here is how these theories can help the understanding of PEB and low-income people, and this has been little discussed by research until now. This literature review is an attempt to fill this gap, considering the importance of these two issues, environment and poverty, and the necessity to have an analysis of the research in this field.

First, it is important to point out that money - the income related problems - is an important issue that affects low-income people's PEB. The eleven articles address this problematic and this is obvious. It is clear that certain kinds of activities that request more money are not available - or are more difficult to be practiced - by poor people. So, for example, PEB based in buying expensive products or that needs to spend more money than normally used for the compared behavior can represent an unsurmountable impediment for poor people to practice the PEB. Therefore, the money, the price of products or services, really affects a person's performance of a certain kind of PEB and sometimes in a stronger and very different way than somebody else's, depending on her or his income.

But the question that drives this article is the idea of going beyond those obvious money related problems, questioning whether there is anything else that can influence low-income people's PEB. There is some research that addresses this question and their findings are investigated here. The eleven articles are about different kinds of PEB - energy conservation, green products consumption, environmental civic engagement - in various countries. In common they point out that self-efficacy, or its similar - perceived behavioral control, or even the collective efficacy (that is the self-efficacy of a group of people) is the psychological construct that influences low-income people's PEB.

The importance of self-efficacy for environmental management is not new, and it has been pointed out in many different kinds of research, and in some literature reviews (Raath & Hay, 2016; Samaddar, Chatterjee, Misra, & Tatano, 2014; Tabernero & Hernández, 2011). However, in reference to low-income people, it is difficult to separate the self-efficacy and the money issue related to PEB. This is what these eleven articles point out and they have important findings and/or environmental policies suggestions based on the application of the self-efficacy construct in each PEB context.

Self-efficacy means the perceived capacity of a person, or a group, to conduct certain behavior and achieve the desired outcome. Therefore, what these articles find are about the application of this construct, understanding in each situation, in each PEB context, what are the kinds of impediments and possibilities to foster the person's or the group's self-efficacy. Each article finds the management or policy solution to elide the different kind of difficulties low-income people encounter in becoming able or perceiving their ability to practice each PEB.

The articles are based on field research, and most of them use a quantitative method. It is also important to point out that the articles analyzed intentions and/or behavior of PEB, but none of them focused on the relationship between intention and behavior. This is in line with the Yuriev, Dahmen, Paillé, Boiral, and Guillaumie (2020) findings that studies using TPB applied to PEB are not working to overcome the problem related to the intention-behavior gap, and their concern is more about understanding the elements that influence intention rather than what can influence actual behavior. Therefore, most of the articles indicate the need of further research in this matter – for example, longitudinal studies and research about the effectiveness of the actions suggested. Al Mamun et al. have four articles (Al Mamun, Fazal, et al. 2018; Al Mamun, Masud, et al., 2019; Al Mamun, Mohamad, et al., 2018; Al Mamun, Mohiuddin, et al., 2018) analyzed here. The investigations are about green consumption in various aspects, also including recycling and green vehicles, and took place in coastal Peninsular Malaysia. The participants were from low-income households. These articles are founded in the TPB and they reach results about the effects of self-efficacy and PBC in influencing PEB. Al Mamun, Fazal, et al. (2018) concluded that the authorities should adopt policies and measures to enhance self-efficacy and PBC towards green products in order to foster their consumption. Al Mamun, Mohiuddin, et al., 2018 states that the improvement of consumers' PBC can happen through policies that promote environmental awareness and knowledge about green products, in order to increase the willingness to pay for them. Al Mamun, Mohamad, et al., 2018 indicates that basis in their findings the government and environmental organizations should evaluate the feasibility of recycling material and promote a supportive system to facilitate and enhance low-income households recycling activities. Al Mamun et al. (2019) indicates that government agencies and automobile organizations should emphasize enhancing low income buyers self-efficacy with policies, for example, that provide information about environmental benefits of green vehicles along with subsidiaries incentives.

Research by Behbehani and Prokopy (2017) explains how a Leadership in Energy and Environmental Design (LEED) certified historic building in the United States' Midwest is able to increase residents' self-efficacy and PBC towards PEB. Such PEB improvement, however, is limited due to residents' financial and health problems, lack of knowledge and lack of environmental interventions in the buildings.

Boomsma et al. (2019) conducted their research with English social housing residents. They found out that psychological factors, including perceived behavioral control (PBC), are influential in energy saving behaviors of these residents no matter what the characteristics of the house are – efficient or inefficient, or damp homes. However, there is an important role that the need for heating comfort plays in their energy saving behaviors. Therefore, energy conservation campaigns should pay attention to energy savings that can exacerbate the thermal discomfort for low-income households.

The Chen et al. (2017) study about low income households in the US reinforces the findings that the PBC is a strong predictor of their energy conservation intentions, along with attitudes, bill consciousness and thermal comfort. Hence the authors direct policymakers to incorporate these aspects in designing campaigns.

Hafner et al. (2020) conducted their research about social housing energy use in the UK. Based on a governmental program that developed games for fostering the energy savings in social housings, they used the TPB to reach their results. Noticing the lack of

PBC, they concluded that the games should be less time consuming and that non-technical approaches should be incorporated, such as social ambassadors.

Russell-Bennett et al. (2018) conducted their research with low-income earners in Australia and concluded that self-efficacy and financial factors share the most positive impacts on the intentions of energy-saving behavior. The complexity of electricity behavior demonstrates that social marketers should center their work on specific electricity-saving behaviors.

Wamuyu (2018) study in Nairobi Mathare slum (Kenya) demonstrated that collective efficacy positively relates to the resident's intentions on continuing to participate in community civic environmental initiatives. The recommendations are to stimulate the use of social media (Web 2.0) to foster civic environmental responsibilities and to enhance their collective efficacy. The authors suggest that policymakers should use the study in waste management issues in order to stimulate stronger responsibility and participation from householders.

Zhao et al. (2016) concluded in their study with Chinese base of pyramid (low income) consumers that self-efficacy holds a significant role in their low-cost household green behaviors. Managers must be aware that low income consumers are influenced by the positive outcomes of green products. Governments can offer financial incentives and awards for lost-cost behaviors, such as resource conservation and waste reduction.

Therefore, the eleven articles highlight the importance of self-efficacy and PBC to enhance low-income people's PEB, despite acknowledging that the monetary factor also plays an important role. The articles punctuate proposals or advice for policymakers to consider the psychological factors - their findings - in designing and implementing environmental policies as well.

## CONCLUSION

The articles reviewed have addressed - in a psychological and management approach - these two major issues that nowadays concern humanity: environmental degradation and poverty. These articles fill the gap in previous research that in general simplifies the situation, dealing with the problems as they have only a money or income aspect. They have the contribution to open minds beyond biases, helping to improve the understanding about low-income people's PEB practices.

The research analyzed here can demonstrate that environmental management programs and policies may have a different approach for each context and each kind of PEB. The articles stress out the necessity of a psychological approach and its contribution to attain a better intervention to really help solving environmental problems, by fostering the PEB practices.

However, there are limitations, especially because the articles are more focused on what can influence intentions of behavior than actual behavior, and they do not analyze factors that can shed light on the problem of intention-behavior gap. Therefore, further research is necessary in order to analyze public policies and environmental management actual applications of the results reached and their effects in solving, or not, the environmental behavior challenges they were designed to address.

In conclusion, these articles research have important contributions to assist the development of environmental management policies that address poor people and their specificities in practicing PEBs, and consequently include a large part of the world population in the common effort of preserving nature. This unbiased psychological approach is able to see poor people without prejudice, understanding and addressing their special needs in order to have a better quality of life in a healthier environment, for them and all of humanity.

## ACKNOWLEDGEMENTS

This study was financed in part by the Coordenação de Aperfeiçoamento de Pessoal de Nível Superior – Brasil (CAPES)

## REFERENCES

- Abrahamse, W., & Steg, L. (2013). Social influence approaches to encourage resource conservation: A meta-analysis. *Global Environmental Change*, 23(6), 1773–1785. <https://doi.org/10.1016/j.gloenvcha.2013.07.029>
- Ajzen, I. (1991). The Theory of Planned Behavior. *Organizational Behavior and Human Decision Processes*, 50, 179–211.
- Ajzen, I. (2002). Perceived Behavioral Control, Self-Efficacy, Locus of Control, and the Theory of Planned Behavior <sup>1</sup>. *Journal of Applied Social Psychology*, 32(4), 665–683. <https://doi.org/10.1111/j.1559-1816.2002.tb00236.x>
- Al Mamun, A., Fazal, S. A., Ahmad, G. B., Yaacob, M. R. B., & Mohamad, M. R. (2018). Willingness to Pay for Environmentally Friendly Products among Low-Income Households along Coastal Peninsular Malaysia. *Sustainability*, 10(5), 1316. <https://doi.org/10.3390/su10051316>
- Al Mamun, A., Masud, M. M., Fazal, S. A., & Muniady, R. (2019). Green vehicle adoption behavior among low-income households: Evidence from coastal Malaysia. *Environmental Science and Pollution Research*, 26(26), 27305–27318. <https://doi.org/10.1007/s11356-019-05908-2>

Ferreira, M. A., & Santana, S. (2021).

Low-income people and pro-environmental behavior: beyond money issues, a literature review. *Millenium*, 2(14), 71–78.

DOI: 10.29352/mill0214.19981

- Al Mamun, A., Mohamad, M. R., Yaacob, M. R. B., & Mohiuddin, M. (2018). Intention and behavior towards green consumption among low-income households. *Journal of Environmental Management*, 227(January), 73–86.  
<https://doi.org/10.1016/j.jenvman.2018.08.061>
- Al Mamun, A., Mohiuddin, M., Ahmad, G. Bin, Thurasamy, R., & Fazal, S. A. (2018). Recycling intention and behavior among low-income households. *Sustainability (Switzerland)*, 10(7). <https://doi.org/10.3390/su10072407>
- Ardoin, N., Heimlich, J., Braus, J., & Merrick, C. (2013). *Influencing Conservation Action: What Research Says About Environmental Literacy, Behavior, and Conservation Results*.
- Bandura, A. (1986). *Social foundations of thought & action*. Prentice-Hall.
- Bandura, A. (1997). *Self-efficacy: The exercise of control* (Seventh printing, 2003). W.H. Freeman and Company.
- Behbehani, L., & Prokopy, L. (2017). The Appropriation of Built Heritage and Pro-environmental Behaviours. *International Journal of Architectural Research: ArchNet-IJAR*, 11(1), 67. <https://doi.org/10.26687/archnet-ijar.v11i1.1195>
- Boomsma, C., Jones, R. V., Pahl, S., & Fuertes, A. (2019). Do psychological factors relate to energy saving behaviours in inefficient and damp homes? A study among English social housing residents. *Energy Research & Social Science*, 47, 146–155. <https://doi.org/10.1016/j.erss.2018.09.007>
- Chen, C., Xu, X., & Day, J. K. (2017). Thermal comfort or money saving? Exploring intentions to conserve energy among low-income households in the United States. *Energy Research & Social Science*, 26, 61–71. <https://doi.org/10.1016/j.erss.2017.01.009>
- Chen, M.-F. (2015). Self-efficacy or collective efficacy within the cognitive theory of stress model: Which more effectively explains people's self-reported proenvironmental behavior? *Journal of Environmental Psychology*, 42, 66–75. <https://doi.org/10.1016/j.jenvp.2015.02.002>
- Clayton, S., Devine-Wright, P., Swim, J., Bonnes, M., Steg, L., Whitmarsh, L., & Carrico, A. (2016). Expanding the role for psychology in addressing environmental challenges. *American Psychologist*, 71(3), 199–215. <https://doi.org/10.1037/a0039482>
- Ding, Z., Jiang, X., Liu, Z., Long, R., Xu, Z., & Cao, Q. (2018). Factors affecting low-carbon consumption behavior of urban residents: A comprehensive review. *Resources, Conservation and Recycling*, 132, 3–15. <https://doi.org/10.1016/j.resconrec.2018.01.013>
- Hafner, R. J., Pahl, S., Jones, R. V., & Fuertes, A. (2020). Energy use in social housing residents in the UK and recommendations for developing energy behaviour change interventions. *Journal of Cleaner Production*, 251, 119643. <https://doi.org/10.1016/j.jclepro.2019.119643>
- Kibert, N. C. (2018). Green Justice: A Holistic Approach To Environmental Injustice. *Florida State University Journal of Land Use and Environmental Law*, 17(1), 169–182.
- Raath, S., & Hay, A. (2016). Self-efficacy: A South African case study on teachers' commitment to integrate climate change resilience into their teaching practices. *Cogent Education*, 3(1). <https://doi.org/10.1080/2331186X.2016.1264698>
- Russell-Bennett, R., Mulcahy, R., Little, J.-A., & Swinton, T. (2018). Money or mind? What matters most in influencing low-income earners to be energy efficient? *Journal of Social Marketing*, 8(1), 2–23. <https://doi.org/10.1108/JSOCM-08-2016-0039>
- Samaddar, S., Chatterjee, R., Misra, B., & Tatano, H. (2014). Outcome-expectancy and self-efficacy: Reasons or results of flood preparedness intention? *International Journal of Disaster Risk Reduction*, 8, 91–99. <https://doi.org/10.1016/j.ijdrr.2014.02.002>
- Tabernero, C., & Hernández, B. (2011). Self-Efficacy and Intrinsic Motivation Guiding Environmental Behavior. *Environment and Behavior*, 43(5), 658–675. <https://doi.org/10.1177/0013916510379759>
- Wamuyu, P. K. (2018). Leveraging Web 2.0 technologies to foster collective civic environmental initiatives among low-income urban communities. *Computers in Human Behavior*, 85, 1–14. <https://doi.org/10.1016/j.chb.2018.03.029>
- Yuriev, A., Dahmen, M., Paillé, P., Boiral, O., & Guillaumie, L. (2020). Pro-environmental behaviors through the lens of the theory of planned behavior: A scoping review. *Resources, Conservation and Recycling*, 155, 104660. <https://doi.org/10.1016/j.resconrec.2019.104660>
- Zhao, G., Cavusgil, E., & Zhao, Y. (2016). A protection motivation explanation of base-of-pyramid consumers' environmental sustainability. *Journal of Environmental Psychology*, 45, 116–126. <https://doi.org/10.1016/j.jenvp.2015.12.003>
- Ajzen, I. (1991). The theory of planned behavior. *Organizational Behavior and Human Decision Processes*, 50, 179–211.
- Ajzen, I. (2002). Perceived behavioral control, self-efficacy, locus of control, and the theory of planned behavior. *Journal of Applied Social Psychology*, 32(4), 665–683. <https://doi.org/10.1111/j.1559-1816.2002.tb00236.x>

- Al Mamun, A., Fazal, S. A., Ahmad, G. B., Yaacob, M. R. B., & Mohamad, M. R. (2018). Willingness to pay for environmentally friendly products among low-income households along coastal peninsular Malaysia. *Sustainability*, 10(5), 1316. <https://doi.org/10.3390/su10051316>
- Al Mamun, A., Masud, M. M., Fazal, S. A., & Muniady, R. (2019). Green vehicle adoption behavior among low-income households: Evidence from coastal Malaysia. *Environmental Science and Pollution Research*, 26(26), 27305–27318. <https://doi.org/10.1007/s11356-019-05908-2>
- Al Mamun, A., Mohamad, M. R., Yaacob, M. R. B., & Mohiuddin, M. (2018). Intention and behavior towards green consumption among low-income households. *Journal of Environmental Management*, 227(January), 73–86. <https://doi.org/10.1016/j.jenvman.2018.08.061>
- Al Mamun, A., Mohiuddin, M., Ahmad, G. Bin, Thurasamy, R., & Fazal, S. A. (2018). Recycling intention and behavior among low-income households. *Sustainability (Switzerland)*, 10(7). <https://doi.org/10.3390/su10072407>
- Ardoin, N., Heimlich, J., Braus, J., & Merrick, C. (2013). Influencing Conservation Action: What Research Says About Environmental Literacy, Behavior, and Conservation Results. Retrieved from <https://naaee.org/eapro/resources/influencing-conservation-action-what>
- Bandura, A. (1986). *Social foundations of thought & action*. New Jersey: Prentice-Hall.
- Bandura, A. (1997). *Self-efficacy: The exercise of control* (Seventh printing, 2003). New York: W.H. Freeman and Company.
- Behbehani, L., & Prokopy, L. (2017). The appropriation of built heritage and pro-environmental behaviours. *International Journal of Architectural Research: ArchNet-IJAR*, 11(1), 67. <https://doi.org/10.26687/archnet-ijar.v11i1.1195>
- Boomsma, C., Jones, R. V., Pahl, S., & Fuertes, A. (2019). Do psychological factors relate to energy saving behaviours in inefficient and damp homes? A study among English social housing residents. *Energy Research & Social Science*, 47, 146–155. <https://doi.org/10.1016/j.erss.2018.09.007>
- Chen, C., Xu, X., & Day, J. K. (2017). Thermal comfort or money saving? Exploring intentions to conserve energy among low-income households in the United States. *Energy Research & Social Science*, 26, 61–71. <https://doi.org/10.1016/j.erss.2017.01.009>
- Chen, M.-F. (2015). Self-efficacy or collective efficacy within the cognitive theory of stress model: Which more effectively explains people's self-reported pro-environmental behavior? *Journal of Environmental Psychology*, 42, 66–75. <https://doi.org/10.1016/j.jenvp.2015.02.002>
- Clayton, S., Devine-Wright, P., Swim, J., Bonnes, M., Steg, L., Whitmarsh, L., & Carrico, A. (2016). Expanding the role for psychology in addressing environmental challenges. *American Psychologist*, 71(3), 199–215. <https://doi.org/10.1037/a0039482>
- Ding, Z., Jiang, X., Liu, Z., Long, R., Xu, Z., & Cao, Q. (2018). Factors affecting low-carbon consumption behavior of urban residents: A comprehensive review. *Resources, Conservation and Recycling*, 132, 3–15. <https://doi.org/10.1016/j.resconrec.2018.01.013>
- Hafner, R. J., Pahl, S., Jones, R. V., & Fuertes, A. (2020). Energy use in social housing residents in the UK and recommendations for developing energy behaviour change interventions. *Journal of Cleaner Production*, 251, 119643. <https://doi.org/10.1016/j.jclepro.2019.119643>
- Kibert, N. C. (2018). Green justice: A holistic approach to environmental injustice. *Florida State University Journal of Land Use and Environmental Law*, 17(1), 169–182.
- Raath, S., & Hay, A. (2016). Self-efficacy: A South African case study on teachers' commitment to integrate climate change resilience into their teaching practices. *Cogent Education*, 3(1). <https://doi.org/10.1080/2331186X.2016.1264698>
- Russell-Bennett, R., Mulcahy, R., Little, J.-A., & Swinton, T. (2018). Money or mind? What matters most in influencing low-income earners to be energy efficient? *Journal of Social Marketing*, 8(1), 2–23. <https://doi.org/10.1108/JSOCM-08-2016-0039>
- Samaddar, S., Chatterjee, R., Misra, B., & Tatano, H. (2014). Outcome-expectancy and self-efficacy: Reasons or results of flood preparedness intention? *International Journal of Disaster Risk Reduction*, 8, 91–99. <https://doi.org/10.1016/j.ijdrr.2014.02.002>
- Tabernero, C., & Hernández, B. (2011). Self-efficacy and intrinsic motivation guiding environmental behavior. *Environment and Behavior*, 43(5), 658–675. <https://doi.org/10.1177/0013916510379759>
- Wamuyu, P. K. (2018). Leveraging web 2.0 technologies to foster collective civic environmental initiatives among low-income urban communities. *Computers in Human Behavior*, 85, 1–14. <https://doi.org/10.1016/j.chb.2018.03.029>
- Zhao, G., Cavusgil, E., & Zhao, Y. (2016). A protection motivation explanation of base-of-pyramid consumers' environmental sustainability. *Journal of Environmental Psychology*, 45, 116–126. <https://doi.org/10.1016/j.jenvp.2015.12.003>