# PRO-ENVIRONMENTAL BEHAVIOR AND RECYCLING: LITERATURE REVIEW AND POLICY CONSIDERATIONS[1]

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## 1. Introduction

Improper municipal solid waste disposal is an environmental problem that can lead to soil degradation, the contamination of water bodies and groundwater through the infiltration of soluble substances in the waste material, emission of gases that are harmful to human health, as well as flooding during heavy rains caused by the blockage of drainage channels. Commonly called "garbage", waste consists of organic and nonorganic materials discarded by households, businesses and government. The rapid rise in solid waste generation stemming from a social context characterized by the accelerated pace of technological change requires the adoption of new patterns of consumption, which in turn calls for greater public participation waste management. In this respect, when collection and recycling systems are implemented, waste adds value for the people involved in this activity (SANTOS; 2009; ROSSOL et al., 2012).

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Geared towards an environmental commitment that meets political, socioeconomic, and demographic needs, environmental policy began to take shape in Brazil after the United Nations Conference on the Human Environment held in Stockholm in 1972. In response to concerns about the environmental impacts of waste generation and disposal, measures were developed that shared responsibilities between the public sector and society. In 2010, the Ministry of the Environment approved the National Solid Waste Policy (PNRS, acronym in Portuguese - Law 12.305/10), which provides for integrated waste management and the implementation of instruments designed to promote recycling and reuse of waste with economic value (BRASIL, 2010).

This policy recommends the development of joint waste management plans providing for public participation in the waste management process. The "three Rs" rule, which is based on economic and social principles, is widely employed to this end. The first "R", reduce, consists of slowing the pace of consumption and using only what is necessary when it comes to water, electricity and consumer goods. The second R is reuse, which entails finding new uses for discarded materials, while the third, recycle, involves separating material that would otherwise be discarded and physically or chemically transforming it into a new product (STEPHANOU, 2013).

Recycling entails participatory waste management, which includes social, economic, and environmental alternatives and requires people to invest time in separating discarded material and returning it to the industrial process (GARCIA et al., 2015). Recycling therefore poses a challenge for public sector managers because it involves a complex array of social factors and behaviors that information-focused and conservative environmental education is unable to address satisfactorily (LOUREIRO, 2005).

Transformative or critical environmental education, which involves multidisciplinary and interdisciplinary studies that adopt a formative and emancipatory approach, has emerged in response to these challenges. The aim of this approach is to deepen people's sense of environmental and social responsibility by adopting teaching-learning processes such as emotional learning, which has been shown to promote pro-environmental behavior. In this way, teachers take on an important role in preparing students to be active citizens (LOUREIRO; 2005; SCHWANKE, 2013; MORAES; CRUZ, 2015).

In the same vein, and with emphasis on the dialectical process, environmental psychology seeks to understand the relationship between people and their social and physical environment, focusing on how environmental conditions influence people as well on how individuals perceive and act on the environment. One of the fields of study within environmental psychology and one of the most widely studied concepts is environmental behavior, also known as pro-environmental behavior. This can be understood as human actions aimed at promoting sustainability and protecting the environment, including the proper separation and disposal of waste. For a behavior to be characterized as pro-environmental, it is must involve conscious and intentional actions, as opposed to actions undertaken autonomously or where environmental preservation is not the motivating factor (PATO; CAMPOS, 2011).

A variety of variables have been used to understand pro-environmental behavior, including peer influence, motivation to recycle, environmental beliefs, altruism, level of information, and environmental perception. Studies have shown that public campaigns

and environmental education can lead to an increase in pro-environmental behavior such as recycling and citizen participation (GONÇALVEZ; PAINHO, 1998). In this respect, the PNRS provides for joint waste management, with emphasis on collective responsibility and social and economic realities. Democratic participation implies policies geared towards waste pickers, the formation of cooperatives, and ensuring that people's voices are heard in different contexts. This approach implies horizontal policies that steer collective strategies, focusing on the development of pro-environmental behavior and enhancing the quality and economic value of waste (DEMAJORAVIC; BESEN, 2007; PINHEIRO, 2014).

The present study reviews the literature on pro-environmental behavior and recycling in order to gain insights into the factors influencing the behavior changes envisaged by public policies. It seeks to contribute to the discussion of individual and collective factors that influence recycling behavior, describing the relations that guide practices, methods and research in the fields of environmental science, environmental education, and environmental psychology and to help rethink interdisciplinarity and social and environmental responsibility.

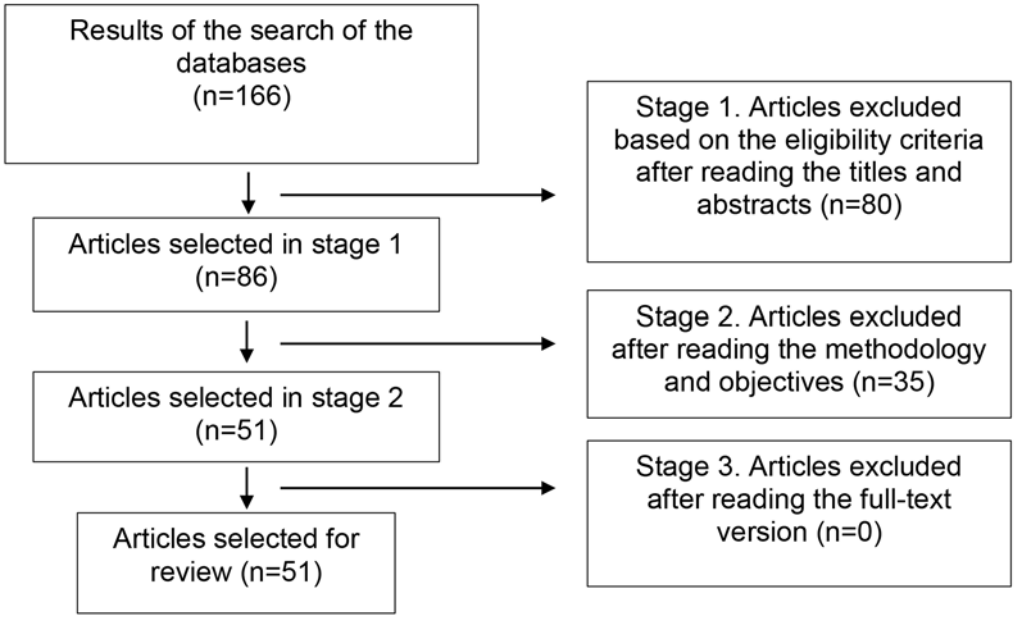
## 2. Methodology

A systematic literature review was conducted using the leading indexing databases PsycINFO, Scientific Electronic Library Online (SCIELO), and EBSCOhost, which are among most widely used databases in the field of psychology in Latin America. A search of publications covering the period January 2010 to December 2017 was conducted to capture studies undertaken since the introduction of the PNRS (Law 12.305/10). The following terms were used: environmental attitudes, pro-environmental behavior, and recycling, based on psychology descriptors published in the Virtual Health Library - Psychology (BVS-Psi Brasil, acronym in Portuguese). The procedures adopted for this review were based on the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA), described by MOHER et al. (2015).

The eligibility criteria were designed to capture articles addressing environmental attitudes and recycling. The search included published articles written in English, Portuguese or Spanish available as full-text versions. In the first stage, articles addressing energy and water saving; solid waste in rural areas; hospital waste; environmental management; ecotourism; cultural theory; validation or elaboration of scales; green consumption; littering on sidewalks; littering in public spaces; and documentary studies, congress proceedings, and texts in which the aim did not mention environmental attitudes and recycling, were excluded.

The search resulted in 156 articles from PsycINFO, two from SCIELO, and eight from EBSCOhost, a significant proportion of which comprised specialist literature from the field of psychology. Eighty-six of these articles were selected based on the above eligibility criteria and 100% agreement between the authors after reading the titles and abstracts. In the second stage, the research methodology and objectives were analyzed, resulting in the selection of 51 articles. In the third and final stage, the full-text version of the articles selected in stage 2 were read to ascertain whether they met the eligibility criteria. This process is summarized below in figure 1.

**Figure 1. Summary of the article selection process**




**Source:** Authors' elaboration

## 3. Results and discussion

The analysis of the 51 articles focused on three aspects: research methodology and instruments used by the studies to identify the main research designs adopted to investigate the person-environment relationship; individual and social factors associated with recycling behavior; and solid waste management policies and pro-environmental behavior.

### 3.1 Environmental attitudes and recycling research methodology

The articles were classified in relation to study design based on Hennekens and Buring (2000). The most used research design was descriptive correlational, accounting for 65% of the studies, followed by descriptive-normative survey (35%). Sample size ranged between 22 and 10,000 participants. The articles addressed the following areas of psychology: environmental psychology (49%), social psychology (43%), and behavioral psychology (8%). The results of the search showed that environmental psychology played a significant role in research exploring the psychological factors that influence the person-environment relationship, providing important inputs to support intervention strategies and environmental awareness raising. With respect to theoretical frameworks, the theory of planned behavior (TPB), proposed by Ajzen and Fishbein (1980), stood out in studies in the area of social psychology. This theory is based on the understanding of

complex variables that tend to predict the likelihood that a specific behavior will occur and accounted for 31% of the studies in this area.

Fourteen of the studies used standardized instruments to explore recycling behavior and environmental attitudes, notably the Information–Motivation– Behavioral Skills Model (IMB), which is used to predict and assess recycling behavior, providing data on lack of information and motivation to recycle (FISHER; FISHER, 2002 *apud* CHAN; BISHOP, 2013). The use of the IMB also allowed researchers to assess personal and social aspects and the interrelationship between the two (SEACAT; NORTHUP, 2010). Table 1 presents the study objectives and the instruments used by the authors. The results show that the scale that was most used to measure environmental attitudes and recycling was the New Ecological Paradigm scale (NEP - Dunlap, et al. 2000), which consists of 15 statements used to measure environmental behavior or environmental attitudes. However, the majority of the studies used questionnaires and interview plans elaborated by the authors (n=24).

**Table 1. Standardized instruments used in the studies addressing environmental attitudes and recycling (n=14)**

| Instrument | Objectives | Authors |
|---|---|---|
| Motivation toward the Environment Scale (MTES: PELLETIER et al., 1998). | Analyze motivation and environmental behavior. | Renaud-Dube; Taylor; Lekes; Koestner and Guay (2010). |
| Frequency of Environmental Behaviors, adapted from PELLETIER et al. (1998). | Measure environmental behavior. | Renaud-Dube; Taylor; Lekes; Koestner and Guay (2010). |
| New Ecological Paradigm (NEP) scale (DUNLAP et al., 2000). | Measure environmental attitudes. | Aguilar-Luzón, Calvo-Salgueiro and Salinas (2012); Xiao and Hong (2010); Walton and Austin (2011); Huffman, Werff, Henning and Watrous-Rodriguez (2014); Onel and Mukherjee (2017). |
| Information-motivation-behavioral skills (IMB) Model (FISHER et al., 1993). | Measure motivation behavior styles. | Seacat and Northup (2010). |
| Reduction, Reuse, and Recycling Scale (BARR, 2007). | Measure reduce, reuse, and recycling behavior using a scale. | Swami, Chamorro-Premuzic, Snelgar, Furnham (2011); Onel and Mukherjee (2017). |
| Recycling Attitudes (VOSS; SPANGENBERG; GROHMANN, 2003). | Measure recycling behavior. | Huffman, Werff, Henning and Watrous-Rodriguez (2014). |
| *Escala de Comportamento Ecológico* (the Environmental Behavior Scale) - PATO; TAMAYO (2006). | Measure environmental behavior across 4 factors (water and energy saving, activism and consumption, urban cleaning, and recycling). | Bescorovaine et al. (2016). |
| Pro-environmental Self-identity Scale (WHITMARSH; O'NEILL, 2010) | Measure aspects of identity and environmental perception. | Truelove et al. (2016). |
| Global Warming Worry Scale (LEISEROWITZ, 2006) | Measure perceptions of global warming. | Truelove et al. (2016). |

**Source:** Authors' elaboration

With respect to research limitations, Chan and Bishop (2013) highlight that there is a relationship between moral conduct and engaging in recycling behavior. However, they highlight the difficulties of self-motivated research, which negatively affects statistical analysis when variance and chi-square values are considered. The use of self-administered instruments and self-reporting in comparative research, observed in seven of the studies, is often criticized because respondents may complete fields incorrectly or fail to complete fields and provide important information, such as socioeconomic data. Furthermore studies (CHAN; BISHOP, 2013; WHITE; HYDE, 2013; AGUILAR-LUZÓN et al., 2012; WHITE; HYDE, 2012; VACCARI et al., 2017) mentioned that the study sample was a limitation, highlighting discrepancies between the socioeconomic characteristics of the sample and general population because they had selected only students or residents from a specific region. Longitudinal research should be conducted to gain a better understanding of the significance of the data collected and ensure more concise monitoring of technologies, policies, and environmental education services (TABERNERO; HERNÁNDEZ, 2011). A multi-method research approach using two or more research methods to explore a topic should also be considered, given the complex nature of person-environment relationships. The use of other methods can help compensate bias caused by specific instruments or data collection techniques (GÜNTHER; ELALI; PINHEIRO, 2011).

### 3.2 Individual and social factors associated with recycling behavior

Subjective factors and social influence, such as self-identity, emotion/affect, information, motivation, perception, gender differences, and access to recycling, have been shown to influence pro-environmental behaviors such as recycling, increasing the likelihood that this behavior will occur.

Motivation is significantly associated with environmental behavior. Recycling among young people is generally motivated by factors that encourage altruism, a perception of consumption that recognizes needs and desires, as well as knowledge about the environment. Internalized values such as altruism and identity reflect a collective attitude (IZAGIRE-OLAIZOLA et al., 2015; RENAUD-DUBE et al., 2010). In today's society, identity is constructed into flexible forms to adhere to established social demands. Consumers are transformed into products and forget who they really are as they fit into the world (MIKLOS; ESCUDERO, 2015). The discussion about identity construction is crucial to promoting a differentiated attitude. With respect to recycling, studies address two major themes: self-identity and self-affirmation.

Self-identity implies the perception of oneself in relation to a behavior to the point of taking ownership of that behavior as a personal characteristic. With regard to recycling behavior, environmental perception becomes relevant in the constitution of identity and enables an active stance of subjectivation, which tends to minimize the main barriers to waste separation: forgetfulness, lack of time, and laziness (NIGBUR et al., 2010; PEARSON; DAWSON; BREITKOPF, 2012; WHITE; HYDE, 2013; WHITMARSH; O'NEIL, 2010). Concomitantly, self-affirmation consists of defending an identity constructed in the face of social pressures and exerts a moderating effect on environmental behavior.

Managing this variable, using focus groups or other group interventions can help to increase motivation to recycle (SPARKS et al., 2010).

Environmental perception can be considered one of the main variables influencing recycling behavior, since it mediates the dispositions and variables mentioned above. It is a complex concept within the field of environmental psychology that translates how a person apprehends his/her environment with the senses, culminating in the possibility of positioning him/herself and acting on the space. In a study that sought to describe how residents perceive their relationship with the environment, Lermen and Fischer (2010) analyzed pollution and health risks in areas surrounding the neighborhood. Using photographs, the participants portrayed contrasting realities of healthy and polluted environments and emphasized the need to hold the government accountable. However, they presented few accounts of their actions as agents to create the change they wanted to see in the environment.

Besides individual factors, social factors can also influence environmental behavior, including peer influence within social groups and the environment. For example, territorial-based social interactions in communities and cities involve subjective aspects linked to environmental attitudes shared by neighbors, such as feelings and emotions.

Mallet (2012) found that people in a social environment in which pro-environmental behavior is part of the code of conduct tend to share "eco-guilt", or guilt that arises when people see or engage in negative environmental behaviors. This feeling is correlated to the transgression of existing norms and associated with social and personal acceptance, or self-affirmation. By giving rise to the spillover effect, guilt effectively mediates recycling behavior, given that raising awareness of the negative impacts of increasing waste is not sufficient to stimulate recycling (FORNARA et al., 2011; MALLET, 2012; ELGAAIED, 2012). This phenomenon leads to the transference of pro-environmental affects, competencies, behaviors and values from one social group to another, facilitating conduct that is geared towards revitalizing culture based on sustainability and a sense of collectiveness (TRUELOVE, 2016).

Emotional learning should also be considered when thinking about recycling, given that mood swings alternating between feelings of sadness, happiness and anger act as mediators of underlying beliefs and attitudes. Thus, when elucidating policy proposals and environmental education, people should be taught how to identify, understand and deal with both their negative emotions related to recycling behavior, such as embarrassment, guilt, sadness, and anxiety, and their positive emotions, such as satisfaction and happiness (BARATA; CASTRO, 2010; CZOPP, 2013; AGUILAR-LUZÓN et al., 2014).

A study with a group of students that explored the emotional effects of social pressure to recycle observed that while students positively approved of recycling, they did not disapprove of lack of engagement in this behavior. When questioned about pressuring non-recyclers, the participants were more inclined to reward and impose than to punish and demand pro-environmental attitudes (NOAL, 2013). This attitude corroborates the assertion that when inconsistent punishment is applied to the environmental awareness raising process subjects only interpret the environment, tending not to assimilate the

rules, because the process focuses on imposing rules of conduct rather than developing altruistic or collective behaviors (ALTAFIM; RODRIGUES, 2015).

This construction is mediated by family and peers, who should be the interlocutors of public campaigns. Small children tend to imitate their parents' behavior and therefore develop intrinsic motivation, which favors pro-environmental behaviors (MATTHIES et al., 2012). Thus, providing information and raising awareness of the three Rs among parents and peers can help build a new generation that is committed to the environment. Social media also influences community behavior, since it allows people to share content at a rapid pace. A study of social networks and recycling showed that recycling behavior increased significantly, showing the importance of interventions using social media for promoting reflection and pro-environmental behaviors (LONG et al., 2014).

### 3.3 Solid waste policies and pro-environmental behavior

The mainstay of municipal solid waste management in Brazil is the PNRS (BRASIL, 2010), which provides that waste management measures should focus on certain specific areas, including the appraisal of the current state of waste management, reduction, reuse and recycling targets, supervision and enforcement, and education for a sustainable future. These goals require behavior changes, studied by environmental psychology in an interdisciplinary manner. Despite being a guiding document for recycling, in addressing behavior changes the PNRS allocates responsibility for this theme almost exclusively to environmental education. There is therefore a clear need to guarantee and promote environmental education, given its systemic and pragmatic nature.

Policy plays a mediating role in relation to environmental behavior, as specific laws are able to influence moral and ethical conduct, while horizontal strategies spur greater public involvement in environmental campaigns. The findings regarding variables associated with recycling behavior show that laws and normative instruments, in the form of clarification of achieved results, recycling credits, and tax reductions for example, provoke positive reactions with recyclers, influencing intrinsic motivation and taking advantage of the spillover effect (TABERNERO; HERNÁNDEZ, 2011; WAN et al., 2013; TRUELOVE et al., 2016; WAN et al. 2017). Thus, people's everyday actions mediated by regulations, as well as learning and awareness raising, can elicit behavior changes, particularly when integrated through interdisciplinarity, with discussions in community associations, approximation of culture and routine practices, and capacity building directed towards local leaders who can exert political influence, such as community health agents, religious leaders, and neighborhood presidents.

The joint management approach envisaged by the PNRS implies a horizontal decision-making process. However, in practice, the process continues to be vertical and, as a result, this type of management is not assimilated by the end consumer. Self-affirmation in identity construction plays an important role in strengthening participation, incorporating differences between communities in terms of behavioral skills, physical structure, and level of information. One example of how identity lacking in self-affirmation can influence pro-environmental behavior is the justification of negative environmental at-

titudes by study participants based on waste treatment failings and/or neglect on the part of the government, thus laying the responsibility squarely on others (COFFEY; JOSEPH, 2015; WAMI et al., 2011).

As mentioned above, not perceiving oneself as an agent of social change reveals a lack of systemic vision, as well as a weak educational and public participation model. There is therefore a need to clarify the impacts of recycling and seek different strategies that make the population coparticipate in the results of selective waste collection, helping to minimize the feeling of detachment from citizen participation (SCHILL; SHAW, 2016).

One solution is co-responsibility between different spheres of government and the population, with the promotion of clear and transparent dialogue to encourage active democratic participation in local government or in specific projects, such as the monitoring of the *Programa Pró-Catador* (Pro-Waste Picker Program), one of the main accomplishments of the PNRS, where active public participation has revealed itself to be one of the drivers of its success. In this way, campaigns are built upon shared perceptions and experiences, rather than on the perceptions and experiences of public managers who are detached from the reality in question (SECAT; NORTHUP, 2010; WHITE; HYDE, 2012).

The use of agents of socialization in educational campaigns has an influence on environmental behavior since, inspired by their identification with these agents, they are more likely to adopt the expected behavior. Besides idols and media role models, community and religious leaders play an important role as social role models with greater proximity to subjects. Information reaches not only the cognitive pathway, but also the emotions, playing a complementary role in the formation of opinion and identity (FABRIS et al., 2010; HUFFMAN et al., 2014; SCHWAB et al., 2014).

In addition to collective proposals related to recycling behavior, strategies related to the expansion of recycling cooperatives and treatment of solid waste should be encouraged as a source of income and social development. Health and environmental initiatives, as well as the environmental beliefs that guide actions in the public sphere, influence recycling behavior and the adoption of positive environmental attitudes. With respect to beliefs regarding the destination of waste, well planned selective collection makes an important contribution to the adoption of environmentally responsible behavior, because people see the selected materials being collected and value their attitude towards separating recyclable material. Supported by a public administration that ensures effective selective collection, people perceive themselves as active players in the recycling process (BEST; KNEIP, 2011; VACCARI et al., 2017).

The provision and maintenance of adequate waste collection equipment by the waste collection authority and private companies facilitates the adoption of pro-recycling behavior (WALTON; AUSTIN, 2011; VOGT; NUNESB, 2014; VACCARI et al., 2017). This type of equipment is crucial to changing behavior. However, it is also important to promote the reduction of consumption and raise awareness on the importance of the adequate disposal of waste. As Miller et al. (2016) suggest, the simple provision of adequate waste containers does not necessarily lead to the adoption of recycling behavior and it is necessary to assess the level of information, beliefs and attitudes of the population in which a change in behavior is expected. In this respect, Wu et al. (2016) found

a correlation between spatial configuration and the likelihood of stimulating recycling, such that environments with a "sustainable design" may encourage pro-environmental and pro-social behavior, showing that spatial configuration of urban areas should seek to stimulate a sense of well-being and ecological balance among passersby.

Basic knowledge about the basic cognitive processes associated with emotions can provide important inputs to inform initiatives designed to promote pro-environmental behavior. The main motivations for adopting recycling behavior include not only identity, but also altruism and the perception of a shared environment. As the PNRS suggests, with each step of its implementation, the challenges of environmental education as a political strategy become more complex, especially with regard to awareness raising and the mobilization of a politicized and conscious community that is active in achieving and upholding the right to democratic participation.

## 4. Final considerations

The variables associated with pro-environmental behavior demonstrate the complexity of this matter and pose a challenge for environmental psychology and other disciplines in the field of environmental sciences in terms of developing an interdisciplinary approach to recycling. In this respect, the multi-method approach presents itself as a way of minimizing bias in environmental psychology studies and bringing research closer to the phenomenon under study. The main studies in this area focus on social processes and identity construction as a starting point for thinking about policy and environmental education, given that in both the individual and collective model self--affirmation and self-identity are constructed as drivers of recycling behavior, supported mainly by environmental beliefs, environmental perception, and altruism. Social policies and educational programs should be implemented by agents who uphold the premise of joint waste management and social mobilization.

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# PRO-ENVIRONMENTAL BEHAVIOR AND RECYCLING: LITERATURE REVIEW AND POLICY CONSIDERATIONS

***Resumo*:** O cenário ambiental exige a participação da sociedade na integração das responsabilidades individuais com as ações políticas. O comportamento pró-ambiental de reciclagem contribui para a adequada destinação de resíduos sólidos, um dos principais desafios na gestão pública urbana. Objetivou-se analisar as produções científicas sobre os comportamentos pró-ambientais e a reciclagem, a fim de tecer apontamentos que favoreçam as mudanças comportamentais previstas nas políticas públicas. Foram consultadas as bases de dados PsycINFO, Scielo e EBSCOhost, utilizando-se as palavras-chave: *environmental attitudes*, *pro-environmental behavior* e *recycling*. Selecionaram-se 51 artigos, no período de janeiro de 2010 a dezembro de 2017. Destacaram-se as investigações sobre motivação ao comportamento de reciclar, influências da rede social e normas sociais. As atitudes ambientais e o comportamento de reciclar mostraram-se relacionados às normas sociais, à motivação, à identidade, ao altruísmo e à conscientização, dimensões essas que devem ser consideradas ao se planejar políticas públicas e ações de sensibilização ambiental.

***Palavras-chave*:** atitude ambiental; Psicologia ambiental; Resíduos sólidos; Saúde ambiental; Sensibilização ambiental.

***Abstract*:** The environmental scenario requires the participation of the society in the integration of individual responsibilities to the political action. The recycling pro-environmental behavior contributes to the proper disposal of solid waste, a major challenge in urban public management. The article aims to analyze the scientific production of the pro-environmental behaviors and recycling in order to weave notes that promote behavioral changes provided for in public policies. The PsycINFO, Scielo and EBSCOhost databases were consulted using the keywords: environmental attitudes, pro-environmental behavior and recycling. We selected 51 articles, among which predominated the investigation into motivation to recycle behavior, influence of social network and social norms. Environmental attitudes and behavior to recycle have shown to be related to social norms, motivation, identity, altruism and awareness; these should be considered when planning public policies and environmental awareness actions.

***Keywords*:** Environmental attitude; Environmental psychology; Solid waste; Environmental health; Environmental awareness.

***Resumen:*** El escenario del medio ambiente requiere la participación social en integración de las responsabilidades individuales con acciones políticas. El comportamiento proambiental de reciclaje contribuye para la destinación adecuada de residuos sólidos, uno de los principales desafíos en la gestión pública urbana. Este estudio tuvo con el objetivo analizar la ciencia de los comportamientos proambientales y el reciclaje con el fin de tejer notas que favorezcam cambios de conducta en las políticas públicas. Las bases de datos PsycINFO, Scielo y EBSCOhost fueron consultadas por las palabras clave: *environmental attitudes*, *pro-environmental behavior* y *recycling*. Fueron seleccionados 51 artículos científicos, predominaban las investigaciones sobre: motivación, influencia de la red social y de las normas sociales. Las actitudes ambientales y el comportamiento ambiental de reciclar aparecen relacionados también con la identidad, el altruismo y la conciencia, y estos deben ser considerados en la planificación de las políticas públicas y acciones de sensibilización ambiental.

***Palabras clave:*** Actitud ambiental; Psicología ambiental; Residuos sólidos; Salud ambiental; Sensibilización ambiental.