THEORETICAL BASES GUIDING CONSERVATION PSYCHOLOGY

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En este artículo se presenta una breve revisión de las teorías más relevantes utilizadas para explicar el comportamiento proambiental. Las teorías científicas permiten captar relaciones complejas, claves para entender los problemas del mundo real, y facilitan la identificación de los componentes más importantes implicados en la explicación de tales problemas, con el fin de poder predecirlos en el futuro. El comportamiento ambiental, es abordado desde las denominadas teorías de largo alcance, es decir, marcos conceptuales como el conductismo, la psicología evolucionista y el cognitivismo, que sirven para explicar cualquier tipo de comportamiento, así como por teorías más específicas centradas en analizar los comportamientos con impacto ambiental, entre las que se encuentran los escenarios de conducta, la teoría de las affordances, y las teorías sobre la relación persona-ambiente. En este trabajo se expone resumidamente cada uno de estos planteamientos teóricos junto a sus principales modelos explicativos.
Palabras Clave: Comportamiento proambiental, Conducta sustentable, Teorías, Psicología ambiental.

The aim of this paper is to present a brief review of the most relevant theories used to explain pro-environmental behavior. Scientific theories allow us to capture complex relationships, key to understanding real-world problems, and they facilitate the identification of the most important components involved in the explanation of these problems, in order to predict them in the future. Environmental behavior is approached based on what are known as long-range theories, that is, conceptual frameworks such as behaviorism, evolutionary psychology, and cognitivism, which explain any type of behavior, as well as more specific theories focused on analyzing behaviors with environmental impact, including behavioral settings theory, the theory of affordances, and theories about the person-environment relationship. This paper summarizes each of these theoretical approaches together with their main explanatory models.
Key Words: Pro-environmental behavior, Sustainable behavior, Theories, Environmental psychology.

Environmental problems represent one of the biggest threats to the survival of humanity and numerous species. These problems include contamination due to toxic agents and climate change, deforestation, the extinction of biological diversity, and the depletion of natural resources (IPCC, 2018). At the base of these problems it is possible to identify psychological determinants that explain, partially, the negative changes that the terrestrial biosphere is experiencing since, ultimately, the human inclinations, decisions, and behaviors that lead to ecological degradation constitute psychological variables. These variables can guide people towards a position of caring for the environment (Clayton & Myers, 2015). Thus, the need becomes evident to develop and/or apply psychological theories that explain why, when, and how human beings act to destroy or, alternatively, to take care of the resources of the planet, which could provide an invaluable contribution to the solution of the serious environmental problems that the planet is experiencing (Akintunde, 2017).

THEORIES OF PRO-ENVIRONMENTAL BEHAVIOR

Environmental psychology is dedicated to studying the reciprocal relationships between human behavior and the socio-physical environment (Aragonés & Amérigo, 2010), incorporating a number of theoretical frameworks to explain the behavior that protects the environment, incorporating ecological, social, and behavioral components.

Environmental psychology contains an aspect known as the *psychology of environmental conservation* (Clayton & Sanders, 2012) or the *psychology of sustainability* (Corral-Verdugo, Frías, & García, 2010). The central object of study of this aspect is *sustainable behavior* (SB), defined as the set of actions aimed at guaranteeing the integrity of present and future socio-physical resources of the planet (Corral-Verdugo et al, 2010). Therefore, to be sustainable, a person must take care of not only natural resources and the biosphere, but also of other people and the socio-cultural fabric of human civilization.

SB includes *pro-ecological behaviors*: actions aimed at preserving natural resources; *frugal behaviors*: acts that avoid consumerism and wasting resources; *altruistic actions*: behaviors of caring for others without expecting anything in return; and *fair behavior*: behaviors that guarantee a distribution of resources and fair treatment of others (Tapia, Corral-Verdugo, Fraijo, & Durón, 2013). Pro-ecological and frugal behaviors

mainly affect the protection of the physical environment (although they also impact on the care of the social environment), whereas altruistic and equitable behaviors focus more on the protection of the social environment whilst also affecting the care of the physical environment (Corral-Verdugo et al, 2010). Research has shown that these four types of behaviors are significantly related to each other, suggesting that a person with a pro-sustainability orientation practices these four behaviors simultaneously (Tapia et al, 2013).

There are several psychological theories that explain the appearance and maintenance of sustainable behaviors. In the present work, we will consider those that, due to their frequent use in research, have been shown to be the most important in the psycho-environmental literature. We will make a division between *long-range theories*, that is, conceptual frameworks such as behaviorism, evolutionary psychology, and cognitivism, which serve to explain *any* type of behavior, and *specific theories*: those used to understand behavior *with environmental impact*, among which are behavior settings, the theory of affordances, and theories about the person-environment relationship.

LONG-RANGE THEORIES
Behaviorism

For behaviorism, the object of study of psychology is the observable phenomena of behavior (Skinner, 1953): actions or activities that can be registered with the naked eye. Behaviors are explained mainly by contextual factors. This is reflected in what is known as the *triple-contingency relationship model*, which establishes that a behavior is contingent upon the appearance of a discriminative stimulus (an environmental event that indicates the occasion for a behavior to occur). The behavior will be repeated, or it will be extinguished, depending on the consequences: if the consequence is positive or reinforcing, the behavior will be maintained and if it is punished or not reinforced it will be extinguished. Usually the consequences are also found in the context of individuals, as is the case of monetary incentives, social reinforcement, or punishment provided by agents external to behaviors that are considered inappropriate (Lehman & Geller, 2004). According to Cone and Hayes (1980), it is possible to identify in the environment a large number of discriminative stimuli that lead to the development of anti-environmental acts: cars that pollute the atmosphere, foods whose production releases greenhouse gases, unlimited water available for many individuals, et cetera. The anti-environmental responses given to these discriminative stimuli produce reinforcing consequences such as comfort, pleasure, and a sense of status, which culminates in the maintenance of actions that harm the environment, most likely throughout people's lives (Lehman & Geller, 2004). Given that these reinforcing consequences are short-term— immediate— they will have a more noticeable effect than the long-term negative repercussions of anti-environmental behavior (pollution, depletion of resources, climate change, etc.).

Behaviorism establishes that this differential effect of the greater influence of reinforcing consequences in the short term, than negative long-term ones, determines that people are more likely to behave anti-environmentally than pro-ecologically (Cone & Hayes, 1980). For the above reasons, behaviorists suggest intervention programs aimed at increasing conservationist behaviors and minimizing behaviors that harm the environment (Geller, Abrahamse, Guan, & Sussman, 2016). The increase of conservationist actions is produced using, mainly, positive reinforcement, modeling, and feedback and the decrease in destructive behaviors is achieved through punishment and the extinction or withdrawal of reinforcers (Lehman & Geller, 2004). The literature shows the relative success of these techniques and their potential to address environmental problems in social and natural settings (see Geller et al, 2016, for a review).

Evolutionary psychology

Evolutionary psychology conceives behavior and psychological processes as adaptations, that is, products of natural selection. These psychological adaptations evolved to face and solve recurrent problems in primitive environments (Barkow, Cosmides, & Tooby, 1992). The environments of today have radically changed but the perceptions and inclinations of the human mind have not and, according to evolutionary psychologists, the basis of ecological problems lies in this disparity. For example, we have a marked appetite for meat, which served the purpose of promoting the survival of the species, but now this appetite not only leads to health problems: it is also one of the biggest causes of greenhouse gas emissions, responsible for climate change (Fiala, 2008). The same can be said of the taste evolved by the exploitation of natural resources, sexual desire, ostentation of social status, and the accumulation of material goods (Tybur & Griskevicius, 2013). The things that in ancestral times were adaptive, in modern times often turn against the species and the environment, because the environment has changed quickly but the mental structure changes more slowly. The result is the pollution of the planet, the massive extinction of species, overpopulation, and climate change, among other environmental problems.

If the primitive mental structure of the human species propitiates anti-environmental behaviors, we should ask ourselves whether there is also some basis for environmental protection behavior in that same structure. According to the psycho-evolutionist literature, the answer is affirmative. We know that people exhibit psychological mechanisms that work by supporting pro-sociality, including altruism and equity (Dickinson, Crain, Reeve, & Schuldt, 2013). There is, for example, evidence that shows how altruism and equity are intrinsically rewarded through the activation of certain brain areas characterized as "pleasure centers" (Moll, Krueger, et al, 2006). A similar thing happens with equity: making equitable decisions and showing aversion to the inequity experienced by others, produces this same brain activity (Zaki & Mitchell, 2011). We should determine whether that reinforcing effect, or

a similar one, is associated to the practice of actions of caring for the natural environment. There is evidence that seems to show that this is the case.

To cite one case, the increase in social status, which very often leads to anti-environmental actions (Tybur & Griskevicius, 2013), can also work in a pro-ecological way. For example, if a community becomes "green", pro-environmental actions become the norm and, the economic investment in pro-sustainable behaviors begins to function as a status signal, multiplying the sustainable behaviors (Sexton & Sexton, 2014).

Cognitive theories
The Moral Norm Activation Model

Research shows that sustainable behaviors are related, among other things, to aspects of a prosocial or moral nature present in people. Given that prosocial or altruistic behavior is understood as that which, although it is individual, benefits the community (Aronson, Wilson, & Akert, 2010), it is not surprising that numerous works have analyzed environmental behaviors based on theoretical approaches that classically have studied altruism (Stern, 1992). For example, the normative influence model on altruism or moral norm activation model (MNA-Schwartz, 1968). This model studies how people perceive and define a situation that requires facing up to a moral decision, in our case, regarding how to behave in relation to the environment. The activation of the moral norm occurs based on two cognitive requirements: a) that the person is aware that their behavior may have consequences on the well-being of other people (awareness of consequences); and b) that the person admits to having a certain degree of responsibility for the consequences that may be produced by their acts (adscription of responsibility). Both requirements are fundamental for altruistic behavior to occur, since they act preceding the activation of moral or personal norms (PN). Since the adoption of this model, environmental behavior is explained based on the interest shown by people regarding how environmental degradation can affect other significant people in their lives. Authors such as Berenguer and Martín (2003), considered environmental behavior, under this perspective, as an "anthropocentric altruism", since environmental behavior is understood as the result of the activation of the personal norm in response to values of an altruistic kind, that is, it responds to the concern that people may have for the welfare of others.

The Value-Belief-Norm Model (VBN) of Environmentalism

Considering that the attitude toward the environment and towards others is a process in which personal values play an important role in the cognitive analysis of the costs and benefits of the action (Payne, Bettman, & Johnson, 1992), and based on the criterion to consider that values "act to guide the action and the development of attitudes towards objects and situations" (Rokeach, 1968 p.160), Stern (2000) has proposed the Value-Belief-Norm model of environmentalism (VNB).

The orientation of values that the individual has will have a direct influence on their beliefs, and, therefore, on their attitude and behavior, since these act as a filter that modulates the information that the person will evaluate, such that, if the information available about the situation, object or behavior itself is congruent with individual values, the person will develop more positive beliefs towards that situation, object or action. Another variable that this model includes is the activation of the personal norm dependent on the values of the individual. Therefore, it will be activated if the individual believes themselves to be in an environmental situation with consequences for him- or herself (values of egoistic orientation), for other people (social values), or for the whole biosphere (biospheric values) and when the person is attributed some degree of responsibility regarding the possible consequences of their behavior. This model establishes a causal relationship between its variables that determines the implementation of ecologically responsible behaviors, for example, the recycling of glass (Aguilar-Luzón, García, Calvo, & Salinas, 2012) or those related to energy efficiency (Jakovcevic & Reyna, 2016). Corraliza and Berenguer (2000) support the results of this model, identifying two determinants of environmental behavior: environmental values (derived in the activation of the personal norm, feelings of moral obligation, and altruism) and beliefs (which arise as a function of the cost-benefit analysis that the person makes about the consequences of the behavior).

The Focus Theory of Normative Conduct

The influence of the social group on pro-environmental behavior has been studied by the focus theory of normative conduct (Cialdini, Reno, & Kallgren, 1990), built on the concept of social norms to explain and predict social behavior. Cialdini et al, (2006) suggest that the individual has two normative reference groups: what most people do in their environment (the descriptive norm) and what is valued by significant individuals (the prescriptive norm or injunctive norm).

The descriptive social influence, or descriptive norm, is generated based on the perception of the behaviors that most people perform, and the behaviors that can be observed in other people. Compliance with these standards is motivated by the fact that they have been proven to be effective and adaptive.

The normative social influence, or prescriptive norm, is produced based on what an individual believes that group members expect from him, based on perceptions about what behaviors are typically approved or disapproved of. The acceptance of these types of rules is based on the anticipation of rewards or punishments.

The theory predicts that the activation of both types of norms generates different behaviors and that norms do not influence behavior in the same way every time and in all situations: if only one of the two types of norms (descriptive or prescriptive) is prominent in the mind of an individual, it will exert the strongest influence on behavior. Cialdini, Reno, and Kallgreen (1990) showed that people throw away more garbage in dirty places (descriptive norm). Lima and Branco (2018) observed that the

intention to recycle was more intense when the descriptive norm was greater and that the salience of social identity was effective when the descriptive social norm was low, and the salience of personal identity favored recycling when the descriptive social norm was high.

The focus theory of normative conduct has also been used to explain anti-environmental behavior: the descriptive and prescriptive norms contribute significantly to explain why people decide not to perform illegal anti-environmental behaviors (Martín, Hernández, Frías-Armenta, & Hess, 2014; Hernández, Martín, Ruiz, & Hidalgo, 2010).

Theories of Reasoned Action and Planned Behavior (TRA and TPB)

According to the model, people are rational beings that act based on the knowledge we may have about a situation or object. This is a general model for the prediction of human behavior (Fishbein & Ajzen, 1975; Ajzen & Fishbein, 1980), which was designed to predict and explain behavior based on two basic premises: a) people behave in a rational way, that is, we take into account the information available and, consequently, we evaluate the results that the realization or not of an action will have; b) the actions will be determined by the intention to carry them out or not as they are under the voluntary control of the individual. Fishbein and Ajzen, postulated that people's attitude towards a certain situation or object would be associated with the beliefs that the person has at that particular moment. But based on TRA, it is not the attitude or assessment that the person makes about an action that will lead him to realize it or not, but rather it is the intention that mediates between the attitude and the behavior. The authors have identified two main factors that influence the intention: a personal factor (the attitude towards behavior) and a normative factor (subjective norm) that is formed from the beliefs that refer to the social norm. The subjective norm has been defined as "the perception of what the people who are important to the person think about whether or not they should perform the behavior" (Ajzen & Fishbein, 1980, p.57). TRA is one of the most used models in psychosocial research. However, it has also received some criticism, for example, that it is a useful model to explain the preceding causes of volitional behavior, restricting its application to this type of behavior, and also criticisms referring to the absence of other variables that could influence intention and behavior (Durán, Ferraces, Rodríguez, & Sabucedo, 2016). To overcome these limitations, Ajzen (1985) and Ajzen and Madden (1986), added a third predictor of behavioral intention and behavior to TRA, and it was renamed the Theory of Planned Behavior (TPB). This third predictor, perceived behavioral control (PBC), is incorporated to predict and explain the other behaviors that escape the voluntary control of the person. PBC and intentions interact in predicting behavior, increasing the predictive power of intention, as the control the person has on their behavior increases (Ajzen, 1985). Both approaches seem to be effective in predicting different behaviors and, in particular, responsible ecological behaviors (Aguilar-Luzón, García, Calvo, & Salinas, 2012; Oom Do Valle, Rebelo, Reis, & Menezes, 2005).

Motivational theories: Self-efficacy and Self-regulation

Maintaining the presumption of pro-environmental behavior as a set of deliberate and competent actions, it is feasible to consider that they are oriented by the interpretation of the situation, the time, and the context in which they are executed (Suárez & Hernández, 2008). An approach that considers these specificities in the explanation of pro-environmental action is found in the self-regulatory processes included in social cognitive theory, particularly in self-efficacy and its group parallel, collective efficacy. According to this conceptualization, people who attribute to themselves high control skills tend to rely on their abilities to respond to environmental stimuli. Of the self-regulatory mechanisms, self-efficacy is the one that has received the most attention.

Self-efficacy refers to the individual's confidence in their ability to cope with a certain situation (Bandura, 1977), reflecting the control that the person believes they have over the circumstances that affect their lives. Self-efficacy influences thinking and behavior, goals and aspirations, resilience to adversity, commitment, effort, results, and perseverance. Also, a high level of self-efficacy influences how environmental demands are perceived and processed: demands and problems are interpreted not as threats but as challenges. Self-efficacy acts as an optimal predictor of the actions in which people decide to get involved and for which they need to exercise a greater level of personal effort (Bandura, 1997).

Recently, self-efficacy has been incorporated into the explanation of pro-environmental behavior. Self-regulated and self-determined behaviors provide the individual with automatic motivation that guarantees the maintenance of their sustainable behaviors. The link between self-efficacy in waste reduction and energy consumption with the satisfaction and intrinsic motivation associated with the execution of these behaviors has been explored in several studies. For example, Tabernero and Hernández (2011) attempted to confirm that people with high self-efficacy develop more environmental behaviors and feel more satisfied with environmental actions than people with a lower perception of efficacy. The results indicated that the degree to which the individual trusts in their ability to recycle determines their level of satisfaction with the recycling behavior and the goals that he or she sets. In turn, the level of self-efficacy and the level of goals determine the intrinsic motivation that the individual manifests when performing this behavior. Similar results are found with respect to the separation of waste (glass, packaging, and paper-cardboard) and with the reduction of purchases and consumption (Hernández, Tabernero, & Suárez, 2010). In a complementary direction are the results obtained by Muiños, et al, (2015), which relate self-efficacy, understood as the perceived ability to carry out a voluntary control of consumption, with the performance of frugal behavior.

Community effectiveness, on the other hand, refers to the perceptions of people regarding the degree of competence of the collective or community to which they belong with respect to the performance of a certain behavior. Sampson, Raudenbush, and Earls (1997) point out that the communities with the highest perception of community effectiveness achieve a greater number of changes in their surrounding urban areas. In the same vein, Tabernero et al, (2015), showed how in communities where citizens shared strong beliefs about their ability to recycle, they generated a greater number of recycling behaviors in their communities, compared to those in the communities where collective efficacy was lower.

SPECIFIC THEORIES
Behavior settings

The framework of behavior settings (BS), developed by Barker (1968) fits within transactional theories, a type of explanatory framework that conceives the person-environment relationship as an indivisible entity. For the transactional approach, the relationship is more important than the elements involved in it, which makes this approach an ecological perspective. In addition, transaction theory addresses the person-environment relationship as associations of interdependence and not as unidirectional cause and effect relationships (Heft, 2012). For Barker, the object of study of psychology should be the interface between a permanent pattern of behavior (for example, activities in a soccer game, an environmental education class, or a field trip) and the environment in which that behavioral pattern occurs (the stadium, classroom, or field). The behavior setting manifests when the setting and the behavioral pattern are present simultaneously and disappears when one of the two elements is absent. Behavioral settings inhibit more behavior than they allow: for example, in a psychology class only actions such as presenting, discussing, doing exercises, or asking are allowed, and the vast majority of other behaviors that constitute the human repertoire of actions are proscribed in that scenario of action. The above generates a very high explanatory power of behavior settings (Heft, 2012). Authors such as Maki and Rothman (2017) discuss the importance of considering the behavioral setting to understand pro-environmental behaviors and intentions. Considering that a large number of behavioral settings (celebrations and festivities, barbecues, convenience stores, just to name a few) contain patterns of anti-environmental behavior, it is necessary to design BS that outlaw these behaviors and generate pro-environmental behavior patterns.

The theory of affordances

The theory of affordances (Gibson, 1979) is also of a transactional nature, and is aimed at studying stimulating patterns in the environment that induce effective responses (those that generate a positive result for the individual). Gibson established that there is a correspondence between certain environmental stimuli and the responses of organisms to these stimuli, which he interpreted as offers or "affordances", that is, the possibilities of action that arise from these stimuli, since they "afford" (or offer) these effective behaviors. The stimulus-response correspondence in these action possibilities is of a transactional nature, since it requires stimuli and responses to act simultaneously. The different possibilities of action would be an emergent product of the transaction. Natural resources contain a wide range of possibilities that encourage responses to exploit these resources (Corral et al, 2017), and it is highly probable that a large part of anti-environmental behaviors will be provoked by action option responses related to the environment since these offer the possibility of enjoying—and squandering—those resources. The question is whether, as there are options for these anti-environmental behaviors, it is also possible to find or design possibilities or opportunities for the generation of effective environmental care behaviors. Kaaronen (2017) proposes a guide to investigate these pro-environmental possibilities of action, providing specific examples for specific settings.

Beliefs about the environment-person relationship

Conceptions about what is the role of humanity in relation to nature are recognized as environmental or ecological beliefs (Dunlap, Van Liere, Mertig, & Jones, 2000; Hernández, Suárez, Martínez-Torvisco, & Hess, 2000). When the beliefs about the person-environment relationship have been analyzed, a dichotomous vision has dominated, which considers the (pro) environment interest and interest in human development as opposing poles. Thus, the analysis of the belief systems on the relations between the human being and the environment finds in the contrast between the dominant social paradigm (DSP) and the new environmental paradigm (NEP) its main core theme of discussion and debate (Dunlap & Van Liere, 1978).

The DSP concept refers to a worldview that emphasizes beliefs in material progress, confidence in the effectiveness of science and technology, and a vision of nature as something to be used for the satisfaction of human needs. On the contrary, the NEP is defined by ideas such as the inevitability of the limits of growth, anti-anthropocentrism, the fragility of natural equilibrium, rejection of human exceptionalism, and belief in the ecological crisis (Dunlap & Van Liere, 1978; Dunlap, Van Liere, Merting, & Jones, 2000).

The dichotomized vision presented by this NEP-DSP core theme of environmental beliefs was endorsed by the appearance of the Anthropocentrism and Ecocentrism scale created by Thompson and Barton (1994). According to the authors, these two dimensions reflect some concern for the environment, but while the first is due to an appreciation of nature for the material benefits it can provide, the second implies a concern for the conservation of the environment itself. In this same direction, results have been found with Spanish samples (Hernández, Suárez, Martínez-Torvisco, & Hess, 2000).

However, there are many results that lead to questioning the

vision of the relationship between people and the environment in terms of confrontation. In the studies of Bechtel et al, (1999) and Corral-Verdugo and Armendáriz (2000), when investigating the ascription of people of different nationalities to the NEP, the ecocentric beliefs behaved differently in the different collectives studied. In Latin American and Japanese samples, NEP and DSP were able to covariate, positively and significantly (Bechtel et al, 1999, 2006; Corral-Verdugo & Armendáriz, 2000). Castro and Lima (2001), in Portugal, also found that some people find no difficulty in making those apparently incompatible visions compatible. Hernández, Corral-Verdugo, Hess, and Suárez (2001) indicate that the relationship between "naturalistic" (ecocentric) and progress (anthropocentric) beliefs is not antagonistic in Mexican students. These findings suggest that there could be an alternative world view that combines anthropocentric beliefs with ecocentric ones. This new paradigm would be based on an interdependent conception of development, which would involve a process of integrating and including human needs in the dynamics of environmental balance.

Interdependence is a way of understanding people's relationships with the environment that constitutes a nucleus of integrative and non-dichotomous beliefs called the new paradigm of human interdependence (NPHI). A first approach to the NPHI was developed by Corral-Verdugo, Carrus, Bonnes, Moser, and Sinha (2008) in an intercontinental study. The NPHI was found to have a high conceptual validity and to be a better predictor of pro-environmental behavior than the NEP scale. According to these results, the NPHI can configure a belief system where ecocentric orientation is basic, without this implying that the relevance and centrality of human welfare is questioned.

Subsequent developments have shown that beliefs in interdependence are based on four factors (human welfare depends on the integrity of nature, the importance of preserving current resources for future generations, compatibility between human development and environmental conservation, and the judicious use of natural resources) and that these components maintain a high degree of integration and commonality organized around a common dimension confirming the consideration of NPHI as a one-dimensional construct (Hernández, Suárez, Corral-Verdugo, & Hess, 2012), although the existence of differences according to gender has also been raised (Calvo-Salguero, Aguilar-Luzón, Salinas, & García, 2014).

FINAL COMMENTS

It was not the purpose of this paper to make a critical analysis of the different theories of pro-environmental behavior. Some of them claim to have great explanatory power. For example, behavior settings that presume to explain more than 80% of the variance of the behavior, against others that "only" explain a third of the variance (TRA, for example). Others (such as behaviorism) exhibit a notorious simplicity, which contrasts with the complexity of transactional theories. In future writings it could (and perhaps should) be undertaken to critically compare the models and theories of conservationist behaviors, which represents a challenge and, at the same time, a necessary task to be developed by environmental psychologists.

CONFLICT OF INTERESTS
There is no conflict of interest.

REFERENCES
Aguilar-Luzón, M. C., García, J.M.A., Calvo-Salguero, A. & Salinas, J. M. (2012). Comparative study between the theory of planned behaviour and the value-belief-norm model regarding the environment on Spanish housewives' recycling behavior. *Journal of Applied Social Psychology, 42,* 2797-2833. https://doi.org/10.1111/j.1559-1816.2012.00962.x

Ajzen, I. & Fishbein, M. (1980). *Understanding attitudes and predicting social behavior.* Englewood Cliffs, NJ: Prentice-Hall.

Ajzen, I. (1985). From intention to action: A theory of planned behavior. In J. Kuhl & J. Beckman (Eds.), *Action-control: From cognition to behavior* (pp. 11-39). Heidelberg: Springer.

Ajzen, I. & Madden, T. J. (1986). Prediction of goal-directed behavior: attitudes, intentions and perceived behavioral control. *Journal of Experimental Social Psychology, 22,* 453-474. https://doi.org/10.1016/0022-1031(86)90045-4

Akintunde, E. (2017). Theories and Concepts for Human Behavior in Environmental Preservation. *Journal of Environmental Science and Public Health, 1,* 120-133. doi: 10.26502/jesph.96120012

Aragonés, J.I. & Amérigo, M. (2010). Psicología Ambiental. Aspectos conceptuales y metodológicos [Environmental Psychology. Conceptual and methodological aspects]. In J.I. Aragonés & M. Amérigo (Eds.), *Psicología Ambiental [Environmental Psychology], 3rd. Ed.* Madrid: Editorial Pirámide.

Aronson, E., Wilson, T.D., & Akert, R.M. (2010). *Social Psychology.* 7th Edition, Upper Saddle River, NJ: Pearson Prentice Hall.

Bandura, A. (1977). Self-efficacy: toward a unifying theory of behavioral change. *Psychological review, 84,* 191-215. http://dx.doi.org/10.1037/0033-295X.84.2.191

Bandura, A. (1997). Self-efficacy: The exercise of control. New York: Freeman

Barker, R. (1968). *Ecological Psychology: Concepts and methods for studying the environment of human behavior.* Palo Alto, CA: Stanford University Press.

Barkow, J., Cosmides, L. & Tooby, J. (1992). *The adapted mind: Evolutionary psychology and the generation of culture.* Oxford, United Kingdom: Oxford University Press.

Bechtel, R. B., Corral Verdugo, V., & de Queiroz Pinheiro, J. (1999). Environmental belief systems: United States, Brazil, and Mexico. *Journal of Cross-Cultural Psychology, 30,* 122-128. https://doi.org/10.1177/0022022199030001008

Berenguer, J. & Martín, R. (2003). Una aproximación al concepto de actitud ambiental [An approach to the concept of environmental attitude]. In C. San Juan, J. Berenguer, J.A. Corraliza & I. Olaizola (Eds.). *Medio ambiente y participación, una perspectiva desde la Psicología Ambiental y el derecho [Environment and participation, a perspective based on environmental psychology and law]*. (pp. 55-64) Bilbao: Servicio editorial de la Universidad del País Vasco [Editorial service of the University of the Basque Country].

Calvo-Salguero, A., Aguilar-Luzón, M.C., Salinas, J. M., & García, J. M. A. (2014). Gender, masculinity and femininity as ecocentrism and anthropocentrism predictors. *Psyecology, 5*, 284-316. https://doi.org/10.1080/21711976.2014.942509

Castro, P., & Lima, M. L. (2001). Old and new ideas about the environment and science: An exploratory study. *Environment and Behavior, 33*, 400-423. https://doi.org/10.1177/00139160121973052

Cialdini, R. B., Demaine, L. J., Sagarin, B. J., Barrett, D. W., Rhoads, K., & Winter, P. L. (2006). Managing social norms for persuasive impact. *Social Influence, 1*, 3-15. https://doi.org/10.1080/15534510500181459

Cialdini, R. B., Reno, R. R., & Kallgren, C. A. (1990). A focus theory of normative conduct: recycling the concept of norms to reduce littering in public places. *Journal of Personality and Social Ppsychology, 58*, 1015-1026. http://dx.doi.org/10.1037/0022-3514.58.6.1015

Clayton, S., & Myers, G. (2015). *Conservation psychology: understanding and promoting human care for nature. 2nd Edition*. West Sussex, UK: Wiley-Blackwell.

Clayton, S. & Sanders, C. (2012). Introduction. Environmental and conservation psychology. In S. Clayton (ed.), *Oxford handbook of environmental and conservation psychology*. Oxford, UK: Oxford University Press.

Cone, J. & Hayes, S. (1980). *Environmental problems; Behavioral solutions*. Monterey, CA: Brooks/Cole.

Corraliza, J. A. & Berenguer, J. (2000). Environmental values, beliefs and actions: A situational approach. *Environment and Behavior, 32*, 832-848. https://doi.org/10.1177/00139160021972829

Corral-Verdugo, V., & Armendariz, L. I. (2000). The "new environmental paradigm" in a Mexican community. *The Journal of Environmental Education, 31*, 25-31. https://doi.org/10.1080/00958960009598642

Corral-Verdugo, V., Carrus, G., Bonnes, M., Moser, G., & Sinha, J. B. (2008). Environmental beliefs and endorsement of sustainable development principles in water conservation: Toward a new human interdependence paradigm scale. *Environment and Behavior, 40*, 703-725. https://doi.org/10.1177/0013916507308786

Corral-Verdugo, V., Frías, M., & García, C. (2010). Introduction to the psychological dimensions of sustainability. In V. Corral, C. García, & M. Frías (Eds.), *Psychological approaches to sustainability*. New York: Nova Science Publishers.

Durán, M., Ferraces, M. J., Rodríguez, M., & Sabucedo, J. M. (2016). The role of anticipated emotions in recycling intention: An extension of the Theory of Planned Behaviour. *Psyecology, 7*, 89-110. https://doi.org/10.1080/21711976.2015.1114215

Dunlap, R. E. & Van Liere, K. D. (1978). The new environmental paradigm. A proposed measuring and preliminary results. *Journal of Environmental Education, 9*, 10-19. https://doi.org/10.1080/00958964.1978.10801875

Dunlap, R. E., Van Liere, K. D., Mertig, A. G. & Jones, R.E. (2000). Measuring endorsement of the new ecological paradigm: A revised NEP Scale. *Journal of Social Issues, 56*, 425-442. http://dx.doi.org/10.1111/0022-4537.00176

Fiala, N. (2008). Meeting the demand: An estimation of potential future greenhouse gas emissions from meat production. *Ecological Economics, 67*, 412-419. https://doi.org/10.1016/j.ecolecon.2007.12.021

Fishbein, M. & Ajzen, I. (1975). *Beliefs, attitude, intention and behaviour: An introduction to theory research*. Reading, Mass: Addison Wesley.

Geller, E.S., Abrahamse, W., Guan, B., & Sussman, R. (2016). Applying behavioral science for environmental sustainability. In R. Gifford (Ed), *Research methods for environmental psychology*. Hoboken, NJ: John Wiley.

Gibson, J. (1979). *The ecological approach to visual perception*. Boston, MA: Houghton Mifflin.

Heft, H. (2012). The foundations of ecological psychology. In S. Clayton (ed.), *The Oxford handbook of environmental and conservation psychology* (pp. 1-40). Oxford, United Kingdom: Oxford University Press.

Hernández, B., Martín, A. M., Ruiz, C., & Hidalgo, M. (2010). The role of place identity and place attachment in breaking environmental protection laws. *Journal of Environmental Psychology, 30*, 281-288. https://doi.org/10.1016/j.jenvp.2010.01.009

Hernández, B., Suárez, E., Martínez-Torvisco, J., & Hess, S. (2000). The study of environmental beliefs by facet analysis: Research in the Canary Islands, Spain. *Environment and Behavior, 32*(5), 612-636. DOI: 10.1177/00139160021972702

Hernández, B., Tabernero, C., & Suárez, E. (2010). Psychosocial motivations and self-regulation processes that activate cnvironmentally responsible behavior. In J. Valentín, & L. Gámez (Eds.), *Environmental Psychology: New Developments* (pp. 109-126). New York: Nova Science Publishers.

IPCC (Intergovernmental Panel on Climate Change, 2018). *Global Warming of 1.5°C, an IPCC special report on the impacts of global warming of 1.5°C above pre-industrial levels and related global greenhouse gas emission pathways, in the context of strengthening the global response to the threat of climate change, sustainable development, and efforts to eradicate poverty*. Incheon, Korea: IPCC.

Jakovcevic, A., & Reyna, C. (2016). Explaining energy efficiency behaviours among Argentinean citizens through

the VBN model. *Psyecology, 7*, 282-306. https://doi.org/10.1080/21711976.2016.1238588

Kaaronen, R. (2017). Affording sustainability: Adopting a theory of affordances as a guiding heuristic for environmental policy. *Frontiers in Psychology, 8*. 1974. doi: 10.3389/fpsyg.2017.01974.

Lehman, P. H., & Geller, E. S. (2004). Behavior analysis and environmental protection: Accomplishments and potential for more. *Behavior and Social Issues, 13*, 13-32. http://dx.doi.org/10.5210/bsi.v13i1.33

Lima, M. L., & Branco, C. (2018). Recycling for my neighbourhood? Using place identity and social norms to promote pro-environmental behaviour. *Psyecology, 9*, 1-32. https://doi.org/10.1080/21711976.2017.1412574

Maki, A., & Rothman, A.J. (2017). Understanding proenvironmental intentions and behaviors: The importance of considering both the behavior setting and the type of behavior. *Journal of Social Psychology, 157*, 517-531. https://doi.org/10.1080/00224545.2016.1215968

Martín, A. M., Hernández, B., Frías Armenta, M., & Hess, S. (2014). Why ordinary people comply with environmental laws: A structural model on normative and attitudinal determinants of illegal anti ecological behaviour. *Legal and Criminological Psychology, 19*, 80-103. https://doi.org/10.1111/j.2044-8333.2012.02062.x

Moll, J., Krueger, F., Zahn, R., Pardini, M., Oliveira, R., & Grafman, J. (2006). Human fronto-mesolimbic networks guide decisions about charitable donation. *Proceedings of the National Academy of Sciences of the United States of America, 103*, 15623-15628. https://doi.org/10.1073/pnas.0604475103

Muiños, G., Suárez, E., Hess, S., & Hernández, B. (2015). Frugality and psychological wellbeing. The role of voluntary restriction and the resourceful use of resources. *Psyecology, 6*, 169-190. https://doi.org/10.1080/21711976.2015.1026083

Oom do Valle, P., Rebelo, E., Reis, E. & Menezes, J. (2005). Combining behavioral theories to predict recycling involvement. *Environment and Behavior, 37*, 364-396. https://doi.org/10.1177/0013916504272563

Payne, J. W., Bettman, J. R. & Johnson, E. J. (1992). Behavioral decision research, a constructive processing perspective. *Annual Review of Psychology, 43*, 87-131. https://doi.org/10.1146/annurev.ps.43.020192.000511

Rokeach, M. (1968). *Beliefs, attitudes and values: A theory organization and change.* San Francisco, CA: Jossey-Bass.

Sampson, R. J., Raudenbush, S. W., & Earls, F. (1997). Neighborhoods and violent crime: A multilevel study of collective efficacy. *Science, 277*, 918-924. DOI: 10.1126/science.277.5328.918

Schwartz, S. H. (1968) Words, deeds and perception of consequences and responsibility in action situations. *Journal of Personality and Social Psychology, 10*, 232-242. http://dx.doi.org/10.1037/h0026569

Sexton, S. & Sexton, A. (2011). Conspicuous conservation: the Prius effect and willingness to pay for environmental bona fides. *Journal of Environmental Economics and Management, 67*, 303-317. https://doi.org/10.1016/j.jeem.2013.11.004

Skinner, B. F. (1953). *Science and Human Behavior.* New York: The Macmillan Company.

Stern, P. C. (1992). What Psychology knows about energy conservation. *American Psychologist, 47,* 1124-1132. http://dx.doi.org/10.1037/0003-066X.47.10.1224

Stern, P.C. (2000). Toward a coherent theory of environmentally significant behavior. *Journal of Social Issues, 56*, 407-424. http://dx.doi.org/10.1111/0022-4537.00175

Suárez, E., & Hernández, B. (2008). La consistencia entre los valores, las actitudes y el comportamiento. Notas desde la Psicología Ambiental [The consistency between values, attitudes and behavior. Notes from Environmental Psychology]. In J. Riechmann (Coord.) *¿En qué estamos fallando?: cambio social para ecologizar el mundo [Where are we failing?: Social change to ecologize the world].* (pp. 129-161). Barcelona: Icaria Editorial

Tabernero, C., & Hernández, B. (2011). Self-efficacy and intrinsic motivation guiding environmental behavior. *Environment and Behavior, 43*, 658-675. doi: 10.1177/0013916510379759

Tabernero, C., Hernández, B., Cuadrado, E., Luque, B., & Pereira, C. R. (2015). A multilevel perspective to explain recycling behaviour in communities. *Journal of Environmental Management, 159*, 192-201. https://doi.org/10.1016/j.jenvman.2015.05.024

Tapia, C., Corral, V., Fraijo, B., & Durón, F. (2013). Assessing sustainable behavior and its correlates: a measure of pro-ecological, frugal, altruistic and equitable actions. *Sustainability, 5,* 711-723. https://doi.org/10.3390/su5020711

Thompson, S. C. G., & Barton, M. A. (1994). Ecocentric and anthropocentric attitudes toward the environment. *Journal of Environmental Psychology, 14*, 149-157. https://doi.org/10.1016/S0272-4944(05)80168-9

Tybur, J. & Griskevicius, V. (2013). Evolutionary Psychology: A fresh perspective for understanding and changing problematic behavior. *Public Administration Review, 73*, 12-22. https://doi.org/10.1111/puar.12003

Zaki, J. & Mitchell, J.P. (2011). Equitable decision making is associated with neural markers of intrinsic value. *Proceedings of the National Academy of Sciences, U.S.A., 108*, 19761–19766. https://doi.org/10.1073/pnas.1112324108