



The role of place identity and place attachment in breaking environmental protection laws

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ABSTRACT

Place identity and place attachment have been related to several environmental variables such as appropriation, residential satisfaction, physical care taken of the neighbourhood, restorativeness, environmental attitudes and, especially, pro-environmental behaviour. However, the role of place identity and place attachment has not been analyzed in relation to anti-ecological behaviours such as transgressions of environmental protection laws. The aim of this study is to analyze the relationship of place identity, place attachment and environmental attitudes to the personal and social norms that explain the likelihood of illegal behaviours against the environment. The sample was composed of men and women, aged from 19 to 70 years, who were resident in rural, urban or tourist areas of a territory under high environmental protection. The strongest predictor of environmental transgression is personal norms, whereas place identity and place attachment have no direct relation with future transgression or personal norms. Place identity influences environmental attitudes and social norms, which are both antecedents of personal norms. The results led us to reconsider the efficacy of interventions aimed at encouraging compliance with environmental laws by only emphasizing individuals' bonds with the environment, and the need to extend the study of the role of personal and social norms in environmental protection.

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1. Introduction

Place identity and place attachment are bonds that people establish with the surroundings in which they carry out their daily activities and go about their personal lives. Place identity, on the other hand, refers to a conception of the self that has been constructed on the basis of the place to which individuals belong and incorporates elements related to the public image of that place (Hay, 1998; Uzzell, Pol, & Badenas, 2002). Place attachment implies affective bonds between people and their surroundings (Devine-Wright, 2007; Low & Altman, 1992; Werner, Altman, Brown, & Ginat, 1993) and the desire to maintain the relationship with the place over time and at different stages in their lives (Giuliani, 2003; Hidalgo & Hernández, 2001). Although the relationship between these two concepts is still open, there is consensus that place attachment is an affective-emotional bond with residence places, whereas place identity is a cognitive mechanism, a component of self-concept and/or of personal identity in relation to the place one

belongs to (Droseltis & Vignoles, 2010; Hernández, Hidalgo, Salazar-Laplace, & Hess, 2007; Lewicka, 2010). In any case, this work focuses on the link of each bond with the environment protection rather than on the relationship between both. Until now, this link has rarely been analyzed, but it is reasonable to suppose that a strong, affective and/or cognitive bond with place may generate higher concern and protective behaviour towards the environment.

Studies show that both bonds become stronger the longer the time spent in a place (Kelly & Hosking, 2008), but it is still unclear if this denotes greater care for the environment. Several works have tested the hypothesis that the formation of bonds with place may lead to greater interest in protecting and preserving such locations, with varying results.

When place identity in relation to natural surroundings is analyzed, it seems to enhance responsible behaviours. Vaske and Kobrin (2001) found that place dependence increases place identity, which has a positive influence on ecologically responsible behaviour among the young people, aged 14–17 years, who participated in a local natural resources programme. The authors state the importance of individuals developing emotional bonds with natural resources in order to increase their daily ecological behaviours. Other studies have analyzed the relation between place identity and several types of ecological behaviour. Thus, Carrus, Bonaiuto, and

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Bonnes (2005) confirm that both pro-environmental attitudes and regional identity are good predictors of the support that participants show to two new protected areas in Italy. Along these lines, Bonaiuto et al. (2008) found the highest levels of voluntary cooperation in water conservation behaviour among prosocial persons with high local identity, while the lowest levels of cooperation were detected among proself persons with low local identity.

Studies that measure place identity in urban areas give less conclusive results. For example, Uzzell et al. (2002) assessed social cohesion and sense of community for two different groups or communities and found contradictory results. In one group, residents with greater cohesion and identity, social identity in this case, showed more intention of becoming involved in pro-environmental behaviours, while the association between both variables was much weaker and more negative in the second group. The study by Moser, Ratiu, and Fleury-Bahi (2002) revealed that identity with the current neighbourhood increased satisfaction and social commitment to improvements made in it. According to the authors, these conditions point to ecological behaviour, but being attached to the former residential neighbourhood had a negative effect on the positive evaluation of the current location. For Aguilar (2002), variations in urban social identity from one community to another reflect the importance of the cognitive significance given to symbols in an urban setting, which may make it more difficult to find relations to ecological behaviours.

The effect of place attachment on environmental protection has seldom been explored and some methodological limitations suggest to interpret results with caution. The main problem stems from unclear measurements of conceptualizations of attachment. For example, Kelly and Hosking (2008) find that “place attachment” among non-residents is related to community participation behaviours, investments in local business and plans to move to the region. Such behaviours are linked to caring for the area and therefore to the likelihood of activating ecological behaviours. In this study, the scale used to measure attachment really includes six factors that cannot rightly be considered attachment: accessibility, property, participation, comfort, safety and action. However, the authors did not confirm the factorial structure of the scale and decided to use a single measurement combining all 22 items. Along these lines, Stedman (2002) found that the place attachment (measured as place identity) of a group of residents in a natural setting has a positive effect on their involvement in activities that protect that setting. Walker and Chapman (2003) found a strong positive association between the place attachment (measured again as place identity and place dependence) of visitors to a national park and the intention to perform pro-environmental behaviours, both inside and outside the park. Similarly, Halpenny (2006) uses a place attachment scale composed of three factors: place identity, place attachment and place dependence. Walker and Ryan (2008) also found a significant correlation between the level of support for conservation plans in a rural area and the level of landscape attachment, although they used a photo-preference survey to ascertain the level of attachment that local residents have to different landscape types.

In most of the aforementioned studies, attachment and identity are treated as synonyms, or identity is considered to be a dimension of attachment. Therefore, taking into account the measurements used in these studies, the variability of the results and the lack of a single criterion to reach final conclusions, it seems that place identity plays an important role in developing pro-environmental behaviours, but not how this variable relates to place attachment.

Moreover, the influence that bonds established with places may have on environmental transgressions has barely been explored. Environmental transgressions harm both the environment and human beings but they are not universally perceived as illegal, or

even reproachable as their “wrongness” is not always obvious (Korsell, 2001). This lack of social reproach may be related to the characteristics of the consequences, sanctions, victims and perpetrators.

The consequences of environmental transgressions are not always immediate or indeed evident. In many cases, as the incident often occurs for the first time, there is no precedent to allow evaluation of the actual situation and predictions of the consequences for the immediate and more distant future. Furthermore, even experts disagree in their evaluation of the harm done, depending on whether or not they are involved with the interests of the different parties. This situation is worse when the punishable effect is not the harm itself but the risk of such harm occurring (Márald, 2001).

The very severe penalties which do exist for environmental transgression are seldom imposed (Márald, 2001; Watson, 2005). This could be because environmental laws have generally been drawn up in response to extreme, catastrophic events, which are in fact infrequent (Korsell, 2001). Although sanctions for those found responsible for ecological disasters are severe, the frequency with which the accused are found guilty of producing these disasters is very low, making legal precedents scarce. As a result, prison sentences for environmental transgressions are very rare and fines are the most frequently imposed penalty (Korsell, 2001; Martín, Salazar-Laplace, et al., 2008; Watson, 2005).

Victims of environmental transgression are not specific individuals but often a large, indeterminate group of people affected in the short- or long-term. In some cases, environmental transgression can affect present and future populations of an entire region. But, as there is no individual victim who feels compelled to report the incident, detection of environmental transgression depends almost exclusively on the efforts of administrations in finding and sanctioning anti-normative behaviour (Martín, Salazar-Laplace, et al., 2008).

The profile of the environmental transgressor also contributes to the peculiarity of environmental offences because they are often committed by ordinary people with no criminal record, motivated by saving small amounts of money (Situ, 1998). Martín, Salazar-Laplace, et al. (2008) showed that most transgressions handled by public administrations across jurisdictions were carried out mainly by individuals in the course of their personal activities related to home care or leisure.

The relationship between bonds with places and anti-ecological behaviours has yet to be explored. However research relating identity processes with other illegal behaviour or with anti-ecological behaviour is available. In the studies by Wenzel (2004a, 2004b) group identification facilitates the internalization of social norms in personal norms on tax behaviour. Social norms, beyond those internalized as personal norms, have no direct effect on tax evasion. Tax behaviour is explained mainly by those social norms internalized as personal norms by participants who identify with the group. Wenzel's results are coherent with the self-categorization theory (Turner, 1991), which explains how individuals internalize social norms as personal norms through the process of self-categorization and identification with the group. Likewise, Frías-Armenta, Martín, and Corral-Verdugo (2009) show that social identity has a direct and significant effect on perceived legitimacy in the application of environmental laws, one of the antecedents of anti-ecological behaviour. In addition to the identification processes, Wenzel's and Frías-Armenta et al.'s studies focus on variables that are relevant to the explanation of compliance with ordinary laws (Tyler, 2006a), such as deterrence variables, and social and personal norms (see also Martín, Hernández, & Ruiz, 2007). The impact of personal and social norms on anti-ecological behaviour and on compliance with environmental laws related to water conservation has also been investigated by Cialdini's and Corral-Verdugo's research teams, respectively.

Studies led by [Cialdini, Reno, and Kallgren \(1990\)](#); [Cialdini et al. \(2006\)](#) of the effects of injunctive social norms and descriptive social norms on anti-ecological behaviour may be relevant here, although the illegality of the behaviour was not a research issue. Injunctive social norms involve perceptions of which behaviours are typically approved or disapproved and are motivated by promises of rewards or punishments. Descriptive social norms involve perceptions of which behaviours are typically performed and are motivated by the fact that they provide evidence of what is effective and adaptive: what most people do. The activation of either type of norm generates different behaviours.

The authors found that making subjects focus on the frequency of an environmental transgression increases the occurrence of this behaviour. In their classic study on littering, [Cialdini et al. \(1990\)](#) showed that people throw more litter onto a dirty rather than a clean floor. The highest level of undesirable behaviour was produced in the experiment when a confederate threw a paper on a dirty floor and the lowest level when the confederate dirtied a clean floor. In the same vein, [Corral-Verdugo, Frías-Armenta, Pérez-Urías, Orduña-Cabrera, and Espinoza-Gallego \(2002\)](#) found that the more others are perceived to be wasting water, the fewer the reasons for conservation and the higher the water consumption. [Cialdini et al. \(2006\)](#) report that activation of injunctive norms (“Please, do not remove...”) were more effective in preventing the anti-ecological behaviour of taking petrified wood from the Petrified Forest National Park in Arizona than activating descriptive norms (“Many past visitors have removed...”). However the activation of descriptive norms increases the occurrence of both anti-ecological and pro-environmental behaviour like recycling ([Cialdini, 2003](#)). These studies also show that other variables, such as previous attitudes toward the specific behaviour, information and even the sense of humour included in the message, influence pro-environmental behaviour simultaneously with descriptive norms.

[Corral-Verdugo and Frías-Armenta \(2006\)](#) addressed the role of personal normative beliefs in water conservation behaviour. They showed that personal normative beliefs have a positive effect on this specific behaviour and that they co-vary positively with beliefs in the efficacy of environmental laws related to water conservation. Self-reported anti-social behaviour however has a negative effect, and beliefs in the inefficacy of water conservation laws produced no effect. Personal normative beliefs are defined in terms of [Schwartz’s \(1977\)](#) personal norm. [Schwartz \(1977\)](#) considers that personal norms are expectations that individuals have of a particular behaviour in a specific situation and that they experience as moral obligations. This definition is based on the classic theories of reasoned action and planned behaviour ([Ajzen & Fishbein, 1980](#); [Fishbein & Ajzen, 1975](#)).

[Thørgensen \(2006\)](#) used Schwartz’s definition, The Focus Theory of Normative Conduct ([Cialdini et al., 1990](#)) described above and [Ryan and Decy’s \(2000\)](#) well-known Self-Determination Theory to elaborate a taxonomy of norms regulating responsible environmental behaviour. [Thørgensen \(2006\)](#) situated descriptive social norms (what most of my acquaintances do), subjective social norms (operationalized as acquaintances’ expectations on subject behaviour) and personal norms (feelings of moral obligation defined by internal reasons), in a continuum of increasing levels of internalization and integration into the self. Descriptive social norm is the more externally motivated whereas subjective social norm is the person’s perception of social pressures to perform a specific behaviour. Personal norm is based on guilt anticipation and feelings of obligation, involving both affective and cognitive processes tied to the self.

Environmental Psychology literature has dealt mainly with how to promote pro-environmental behaviours but it has not addressed how to cope with illegal anti-ecological behaviours. Therefore, this work combines studies on place identity with studies on personal

and social norms in relation to environmentally significant behaviour, in an attempt to expand knowledge of these constructs and to understand illegal anti-ecological behaviour. For this purpose, we elaborate a model relating the main variables described in those studies and use path analysis to assess the role of place identity, environmental attitude, and personal and social norms in explaining illegal anti-environmental behaviour.

The main antecedent of the likelihood of illegal anti-ecological behaviour would be personal norms. Thus responsible behaviour depends on the strength of personal norms while social pressure is less important. The stronger the personal norms rejecting illegal anti-ecological behaviour the less likely will it be for a person to develop illegal anti-ecological behaviours. This hypothesis is coherent with [Schwartz’s \(1977\)](#) norm activation theory and is supported by the empirical evidence provided by [Wenzel \(2004a, 2004b\)](#) for tax behaviour, [Tyler \(2006a\)](#) for obeying the law, [Thørgensen \(2006\)](#) for pro-environmental behaviours, [Corral-Verdugo and Frías-Armenta \(2006\)](#) for water conservation, and [Frías-Armenta et al. \(2009\)](#) for anti-ecological behaviours. Besides, the likelihood of illegal anti-ecological behaviour is expected to be positively influenced by descriptive social norms, and negatively influenced by environmental attitude and place identity. The relationship between descriptive social norms and the likelihood of illegal anti-ecological behaviour is hypothesized on the basis of The Focus Theory of Normative Conduct ([Cialdini et al., 1990](#)) and the empirical evidence provided by [Cialdini \(2003\)](#) and [Thørgensen \(2006\)](#).

Environmental attitude is expected to be related to the likelihood of illegal anti-ecological behaviour according to classic theories relating attitude and behaviour such as The Theory of Reasoned Action and The Theory of Planned Behaviour ([Ajzen & Fishbein, 1980](#); [Fishbein & Ajzen, 1975](#)) and empirical evidence provided by [Thompson and Barton \(1994\)](#).

Place identity is expected to be related to the likelihood of illegal anti-ecological behaviour according to research relating place identity and pro-environmental behaviour described above and [Turner’s \(1991\)](#) self-categorization theory. [Turner \(1991\)](#) states that the individual’s identification with the group enhances internalization of social norms and conformity processes. Studies by ([Wenzel, 2004a, 2004b](#); [Wenzel & Jobling, 2006](#)) also support this hypothesis for tax behaviour. In addition, following [Turner’s \(1991\)](#) rationalization that individuals’ identification with the group influences their attitudes, place identity is also expected to have an indirect effect on illegal anti-ecological behaviour by influencing environmental attitude. Given that there is not enough research to hypothesize the role of place attachment in the proposed theoretical model, this study only explores its relationships with the variables included.

Personal norms would be positively influenced by environmental attitude and subjective social norms which, in turn, would be positively influenced by injunctive social norms. Although a direct relationship between environmental attitude and illegal anti-ecological behaviour has been predicted, environmental attitude is also expected to influence personal norms, as suggested by The Value-Belief-Norm Theory of Environmentalism ([Stern, 2000](#)) in which moral obligation is determined by beliefs in the person-environment relationship. Subjective social norms are considered an antecedent of personal norms following [Thørgensen’s \(2006\)](#) continuum of norm internalization. This continuum also justifies the fact that injunctive norms would have an impact on anti-ecological behaviour ([Cialdini et al., 1990](#)), but indirectly through subjective social norm and personal norm (see also [Wenzel, 2004a, 2004b](#)). Place identity would also have an impact on injunctive social norm and on environmental attitude. [Turner \(1991\)](#) states that the individual’s identification with the group enhances conformity with group norms ([Wenzel & Jobling, 2006](#)). It therefore seems reasonable to expect that, in the environmental domain,

identification with place would enhance individuals' perception of people's rejection of illegal anti-ecological behaviour.

2. Method

2.1. Participants

This study involved 264 persons selected through quota sampling from the local residents of an island where high environmental protection is in place and where environmental laws are particularly salient (see <http://www.todotenerife.es/>). Quotas were based on age criteria (17–29 years, 30–46 years and over 46 years), gender and residential area (rural, urban and tourist). This procedure resulted in a sample composed of 48.5% men and 51.5% women, aged between 19 and 70 years, with an average age of 34.81 years ($SD = 13.9$), living in rural (37.1%), urban (27.7%) and tourist (35.2%) areas, respectively. Table 1 shows participant distribution according to the three selection criteria.

2.2. Instrument

Participants completed an anonymous self-reporting questionnaire to gauge their responses using Likert-type scales ranging from 1 = Not at all, to 10 = Very much. The questionnaire was divided into two sections. The first included five items that measured the likelihood of performing illegal anti-environmental behaviours, along with personal and social norms associated with these conducts. The second required participants to complete the scales of Place Attachment, Place Identity and Environmental Attitude. Below is a description of each section.

The first part of the questionnaire included an item about the Likelihood of Illegal Anti-Ecological Behaviour, which required participants to quantify the likelihood of performing seven specific illegal anti-ecological behaviours. Participants responded on a scale from 0 (Not likely) to 10 (Very likely). We considered it necessary to measure the Likelihood of Illegal Anti-Ecological Behaviour given that some anti-ecological behaviours are uncommon (lack of conditions or opportunity). We wanted to know whether participants would act in this way if they had the chance to do so, thereby revealing their anti-environmental tendencies. The other four items in the first part measured the following variables for each instance of illegal anti-ecological behaviour: Personal Norm (To what extent do you personally believe it is wrong to perform these behaviours?); Descriptive Social Norm (How many people do you think have acted in this way in the past year in the Canary Islands?); Injunctive Social Norm (To what extent do you think most people consider it wrong to behave in the following way?) and Subjective Social Norm (To what extent do you think that the five people who are most important to you would disapprove of the following behaviours?). These questions were derived from Martín et al. (2007), who in turn based their work on Cialdini et al. (1990); Tyler (2006a, 2006b) and Wenzel (2004a, 2004b).

Each of the five items was answered in relation to seven illegal anti-ecological behaviours: unauthorized camping on a beach,

pouring sewage into the sea, building a dwelling on land designated for agricultural use, turning music up so loud that it annoys the neighbours, disposing of rubble and used electrical appliances on a piece of land, abandoning pets and constructing or refurbishing a dwelling without the necessary permit.

These behaviours were selected on the basis of previous research. First, an analysis was carried out of the characteristics of environmental transgressions involved in 1505 files handled by four public administrations in charge of environmental law enforcement across federal, state, island and municipality jurisdictions in the place where the present study was undertaken. Second, twenty infractions were selected depending on the type of infraction, the type of transgressor, the context where the infractions took place and their frequency. Third, these infractions were scored on 14 scales and data were analyzed by multidimensional scaling. Lastly, seven of the twenty infractions were selected by considering their salience in the resulting dimensions (construction activities, environmental impact and economical benefits) and their familiarity for the participants (Hernández et al., 2005; Martín, Hernández, et al., 2008; Martín, Salazar-Laplace, et al., 2008). Participants' responses to each item on the seven illegal anti-ecological behaviours were referred to participants' place of residence. These responses were averaged across the seven illegal anti-ecological behaviours to obtain a single score for each variable.

The second part of the questionnaire included three Likert-type scales: two for measuring Place Attachment and Place Identity (Hernández et al., 2007) and one for measuring Environmental Attitude (Thompson & Barton, 1994). Place Attachment and Place Identity were assessed in relation to the island where participants currently resided. The place attachment scale incorporates eight items referring to the affective aspects of place bonds (e.g., "I like living on this island") and the place identity scale incorporates four items referring to the representational aspects of place bonds (e.g., "This island is part of my identity"). Environmental Attitude was measured using the Spanish adaptation of Thompson and Barton's Scale (1994), which is composed of 15 items and focuses on environmental beliefs as components of general environmental attitudes (Amérigo, Aragonés, Frutos, Sevillano, & Cortés, 2007; Amérigo, Aragonés, Sevillano, & Cortés, 2005).

The questionnaire also included a series of socio-demographic data (gender, age and place of residence) to determine the sample profile. Two versions were prepared to counteract any carry-over effect in the responses, using two orders for illegal anti-ecological behaviours and for the items in the second part.

2.3. Procedure

The questionnaire was applied by a group of 12 trained interviewers who were each assigned a specific number of interviews, according to residential area, gender and age. The interviewers selected participants who met the sampling requirements and conducted the interviews in an appropriate location.

The interviewers read the questions to the participants and noted down the corresponding responses. Before asking the questions, the interviewers explained a series of instructions that appeared at the beginning of the questionnaire and gave an example to check interviewees' understanding. Interviewers asked interviewees for a contact telephone number, informing them that they would receive a call from a supervisor to check that the interview had taken place. A random telephone follow-up was used to check 30% of the interviews, confirming that the questionnaire had been suitably applied in all cases. The questionnaire took between 20 and 30 min to complete.

Table 1
Sample distribution according to residential area.

Age	Residential area					
	Rural		Urban		Tourist	
	Women	Men	Women	Men	Women	Men
<30	25	25	25	17	21	27
30–45	11	9	6	10	8	8
>45	17	11	7	8	16	13

3. Results

First, we present the mean and standard deviation of the individuals' responses to the items contained in the questionnaire: the Likelihood of Illegal Anti-Ecological Behaviour, Personal Norm, Descriptive Social Norm, Subjective Social Norm and Injunctive Social Norm (see Table 2). Subsequently, we provide the descriptive statistics, internal consistency of the scales and correlations between the variables. We then present the results of the path analysis in order to relate illegal anti-ecological behaviours to the normative variables, environmental attitude and place identity measurement.

The means show that participants report low probability values of anti-ecological behaviour (from .10 to around 5, on a scale from 0 to 10). "Unauthorized camping on a beach" and "Turning up music so loud that it annoys the neighbours" show the highest values of likely future occurrence, while the least likely are "Abandoning pets" and "Pouring sewage into the sea".

Least likely behaviours were accompanied by the highest levels of rejection in terms of personal and social norms, while most likely behaviours scored lower for these items.

Below we outline the internal consistency of the scales used to assess each variable, analyzed using Cronbach's alpha, and the descriptive statistics. In general, reliability values are satisfactory and range between .91 for the Place identity scale and .63 for the Likelihood of Illegal Anti-Ecological Behaviour scale. Eliminating the item concerning abandoning pets the Likelihood of Illegal Anti-Ecological Behaviour scale increases the consistency to .66. This item also has the lowest mean for the Likelihood of Illegal Anti-Ecological Behaviour scale and was eliminated for future analysis.

The items Disposing of rubble and used electrical appliances on a piece of land, and Pouring sewage into the sea were kept despite also having low means because the internal consistency remains the same and because both infractions are highly relevant in environmental terms, given that these disposals cause permanent damage to the physical environment. Eliminating these items would mean reducing the infractions under analysis to illegal noise, camping and constructions.

The internal consistency of the Likelihood of Illegal Anti-Ecological Behaviour scale after eliminating the item concerning abandoning pets, although acceptable, was still modest. In order to improve it, an analysis of the items capacity of discrimination using Likert (1932, 1971) procedure of extreme-group comparison was carried out. Table 3 displays contrast statistics for each of the items of the scale showing that all items have an adequate capacity to discriminate between participants with high and low Likelihood of Illegal Anti-Ecological Behaviour. Therefore, all of them were kept in the final scale. Consequently, the mean for the six remaining anti-ecological behaviours was calculated for each question about norms and likelihood of behaviour.

Table 2

Mean and standard deviations in the seven anti-ecological behaviours in the variables used.

	Likelihood of illegal behaviour		Personal norm		Descriptive social norm		Subjective social norm		Injunctive social norm	
	Mean	SD	Mean	SD	Mean	SD	Mean	SD	Mean	SD
Unauthorized camping on a beach	4.87	3.82	4.67	3.39	6.77	2.28	4.41	3.68	4.43	2.72
Pouring sewage into the sea	.48	1.38	9.19	1.81	5.72	2.52	8.47	2.26	7.06	2.68
Building a dwelling on land designated for agricultural use	2.10	3.02	7.51	2.80	5.71	2.54	6.68	2.93	6.07	2.83
Turning music up so loud that it annoys the neighbours	3.49	3.24	6.70	2.89	6.53	2.18	6.39	2.89	5.04	2.74
Disposing of rubble and used electrical appliances on a piece of land	.85	1.77	8.71	2.14	6.22	2.48	8.01	2.43	6.58	2.69
Abandoning pets	.10	.66	9.43	1.46	5.54	2.45	9.03	1.94	6.98	2.82
Constructing or refurbishing a dwelling without the necessary permit	3.39	3.62	7.05	2.91	6.68	2.36	6.12	3.19	5.84	2.79

Table 3

Contrast statistics for items of the scale likelihood of illegal anti-ecological behaviour.

	t	Difference of means
Unauthorized camping on a beach	-20.93 (**)	-7.42
Pouring sewage into the sea	-3.51 (**)	-.91
Building a dwelling on land designated for agricultural use	-11.44 (**)	-5.05
Turning music up so loud that it annoys the neighbours	-11.09 (**)	-5.01
Disposing of rubble and used electrical appliances on a piece of land	-6.02 (**)	-2.03
Constructing or refurbishing a dwelling without the necessary permit	-18.59 (**)	-6.99

**Correlation is significant to level .01 (bilateral), gl = 130.

For Place Attachment and Place Identity and Environmental Attitude, the mean for all the items in each scale was calculated. Table 4 displays these results.

Table 5 shows the correlations between the variables analyzed. As expected, the correlation between Place Attachment and Place Identity is significant and positive. Place Identity correlates with Injunctive Social Norm, Subjective Social Norm and Environmental Attitude, while Place Attachment only maintains a significant correlation with Place Identity.

Likewise, correlations are significant between most of the various social norms analyzed, so that Injunctive Social Norm, Personal Norm and Subjective Social Norm correlate among themselves but not with Descriptive Social Norm. Another notable aspect is the relationship between future behaviour and the remaining variables, so that Personal Norm and Subjective Social Norm correlate the most with future behaviour, followed by Descriptive Social Norm. Environmental Attitude is positively related to Personal and Social Norms, and to Place Identity but not to future behaviour or Place Attachment.

The correlations obtained were as expected, clearly evidencing the role of Place Identity and Environmental Attitude on behaviours that infringe environmental protection laws.

Lastly, we carried out a path analysis to assess the role of Place Identity, Environmental Attitude, and Personal and Social Norms in explaining Illegal Anti-Ecological Behaviour, as hypothesized in the proposed model. This model explains 26% of Illegal Anti-Ecological Behaviour and 26% of Personal Norm. Indicators of goodness-of-fit for this model are shown in the legend of Fig. 1.

Fig. 1 shows that Likelihood of Illegal Anti-Ecological Behaviours can be predicted from Descriptive Social Norm and Personal Norm. Personal Norm is influenced by Subjective Social Norm, which in turn is influenced by Injunctive Social Norm. Moreover, Place Identity influences Injunctive Social Norm and Environmental Attitude, which in turn influences Personal Norm.

As expected, the relationship between Likelihood of Illegal Anti-Ecological Behaviour and Personal Norm was negative whereas the

Table 4
Descriptive statistics and internal consistency for each scale.

Variables	Minimum	Maximum	Estimated	Standard deviation	Cronbach's alpha
Place attachment	2.75	10	8.33	1.45	.90
Place identity	0	10	8.75	1.96	.91
Descriptive social norm	.43	10	6.17	1.57	.73
Likelihood of illegal behaviour	0	8.33	2.53	1.78	.66
Injunctive social norm	0	10	6.00	1.97	.81
Personal norm	0	10	7.6	1.6	.73
Subjective social norm	.71	10	7.01	1.83	.76
Environmental attitude	3.53	9.87	6.97	1.22	.72

relationship between Likelihood of Illegal Anti-Ecological Behaviour and Descriptive Social Norm was positive. Indeed, as more participants feel morally obliged to comply with pro-environmental laws, they are less likely to perform anti-ecological behaviour. However, the more participants perceive more people behaving illegally, the higher the likelihood that participants will behave in this way. Likewise, the positive influence of Injunctive Social Norm on Subjective Social Norm, and of the latter on Personal Norm, was confirmed.

Contrary to expectations, Environmental Attitude and Place Identity do not significantly influence Likelihood of Illegal Anti-Ecological Behaviour. However, as hypothesized, Environmental Attitude positively influences Personal Norm, and Place Identity positively influences Environmental Attitude and Injunctive Social Norm.

4. Discussion

These results are consistent with previous research into the relation between norms and anti-ecological behaviour (Cialdini et al., 1990, 2006; Corral-Verdugo & Frías-Armenta, 2006; Corral-Verdugo et al., 2002; Frías-Armenta et al., 2009). Therefore, as the results concerning the relationship between norms, place identity and environmental attitude within the context of illegal anti-ecological behaviour are the main purpose of this work, the line of argument for the following comments will focus on these relationships.

As Wenzel's (2004a, 2004b) work on the role of social identity in tax paying shows, our findings also underline the importance of identity processes in the formation of social and personal norms. In Wenzel's work, social identity acts as a mediating variable between the injunctive and personal norms. In our work, however, place identity plays a significant role as an antecedent of injunctive social norms.

Place identity and place attachment are significantly related as in previous studies (Hernández et al., 2007). However, while place identity has become part of the proposed model, place attachment is not directly related to illegal anti-ecological behaviour. This finding apparently contradicts the results of studies relating pro-

Table 5
Correlations between the variables studies.

	Place identity	Descriptive social norm	Likelihood of illegal behaviour	Injunctive social norm	Personal norm	Subjective social norm	Environmental attitude
Place attachment	.58(**)	.08	-.03	.12	.06	.15	.026
Place identity		-.04	-.01	.17 (**)	.01	.16 (**)	.14 (*)
Descriptive social norm			.12 (*)	-.06	.08	-.02	.03
Likelihood of illegal behaviour				-.03	-.44 (**)	-.24 (**)	-.09
Injunctive social norm					.14 (*)	.28 (**)	.13 (*)
Personal norm						.47 (**)	.24 (**)
Subjective social norm							.18 (**)
Environmental attitude							

**Correlation is significant to level .01 (bilateral); *Correlation is significant to level .05 (bilateral).

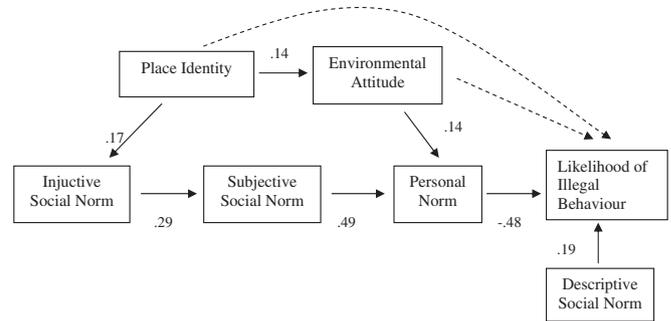


Fig. 1. Path analysis of the influence of norms on the likelihood of illegal anti-ecological behaviours and the role of environmental attitudes and place identity (Chi-squared (gl; 11) = 21,225; P = 0.03; CFI = .95; RMSEA = .05).

environmental behaviour and place attachment (Halpenny, 2006; Stedman, 2002; Walker & Chapman, 2003; Walker & Ryan, 2008). The reasons for such difference may be diverse. Firstly, all previous studies analyzed pro-environmental behaviour and not illegal anti-ecological behaviour, whereas the predictors of each may be different. The lack of studies analyzing both place attachment and anti-ecological behaviour at once prevents us from contrasting our results with previous research. Future studies are needed to confirm or to refute them. Secondly, the lack of impact of place attachment might be explained by the fact that the studies available either make use of the terms place identity and place attachment as synonyms, or consider place identity as a dimension of place attachment, overlapping the measurements of both place bonds. Furthermore, the scales used to measure place attachment have varied broadly from study to study, making comparisons difficult.

Another explanation for the lack of impact of place attachment might be that the role of place identity, and not of place attachment, in our model is due to the fact that identity is basically a cognitive process (Proshansky, Fabian, & Kaminoff, 1983), while attachment is linked to emotional processes (Giuliani, 2003; Low & Altman, 1992). It is therefore reasonable that place identity may have a direct effect on injunctive social norm, which also has a strong cognitive component. Moreover, that place identity is related to environmental attitude is consistent with studies relating both place identity and specific environmental attitudes with pro-environmental behaviours (Bonaiuto, Carrus, Martorella, & Bonnes, 2002; Stedman, 2002), but our results go farther showing that place identity significantly predicts environmental attitude.

Also worthy of comment is that environmental attitude influences personal norms and that this in turn influences illegal anti-ecological behaviour, yet environmental attitude does not directly influence illegal anti-ecological behaviour, unlike pro-environmental behaviour (Vining & Ebreo, 2002). The fact that illegal anti-ecological behaviour is an example of anti-normative behaviour may be behind this result. Given that such conduct is bound up with the law,

personal norms are required to control it. While pro-environmental behaviour may be intrinsically motivating and directly related to environmental attitude, it is hard to believe that this attitude directly influences compliance with a law that punishes certain behaviours.

The above results led us to reconsider the efficacy of interventions aimed at encouraging compliance with environmental laws by only emphasizing individuals' bonds with the environment, and the need to extend the study of the role of personal and social norms in environmental protection. However, future studies should also explore why place attachment falls outside the model, despite its relation to place identity. A possible line of research could be to incorporate other affective and emotional variables related to the likelihood of performing illegal anti-ecological behaviours. Similarly, given that this work has used a measurement of place attachment and place identity associated with the island as a whole, an adaptation of the measurements of these bonds to the specific setting in which illegal anti-ecological behaviours take place could be useful. To that end, this study is a first step towards creating models that will help to clarify the relation between place attachment, place identity and illegal anti-ecological behaviour, as well as to predict this kind of behaviour, which has such serious consequences for the environment.

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