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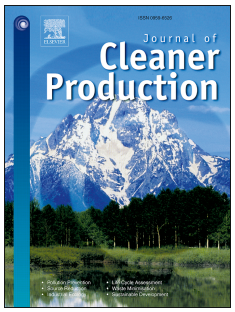

Residents' behaviour as a function of cognitive appraisals and affective responses toward a petrochemical industrial complex

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RESIDENTS' BEHAVIOUR AS A FUNCTION OF COGNITIVE APPRAISALS AND AFFECTIVE RESPONSES TOWARD A PETROCHEMICAL INDUSTRIAL COMPLEX

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Abstract

Environmental degradation due to polluting industrial complexes constitutes a relevant issue for local community. Most studies focus on the negative externalities, in terms of pollution, of these industrial complexes, although some research has also explored the economic benefits of these installations and the harm their closure can inflict on the local economy. **In the context of a petrochemical complex located in Castellón (Spain), the present paper analyses how residents' cognitive appraisal of the economic and environmental aspects leads to their affective responses, and how both elements –cognitive and affective– jointly explain their behavioural intention. The proposed hypotheses are tested on a sample of 992 individuals. The results confirm that cognitive appraisals, directly and by means of the affective response, have a significant influence on the residents' behavioural intention towards their place of residence. The findings also show that affective response has a higher impact than cognitive response and, additionally, that environmental aspects play a more important role than economic ones. Furthermore, the relationship between affects and behavioural intention has a greater weight among citizens who live closest to the petrochemical complex. Implications for firms' and public authorities' environmental management are discussed.**

Keywords: Polluting industrial complexes; environmental appraisal; economic appraisal; affects; citizens' behavioural intention; regional sustainability planning.

1. Introduction

Industrial complexes composed by firms with a polluting activity contribute to the environmental deterioration of their geographical surroundings. The local community, as a stakeholder (Azapagic, 2004; Bremmers et al., 2007; Kulkarni, 2000), is specially affected by this question. The literature has explored the impact on people's living conditions of residing in the vicinity of these complexes and other kind of contaminating installations such as waste disposal sites, nuclear power plants etc. (see, for example, Atari et al., 2011; **Axelsson et al., 2013**; Baxter and Lee, 2004; Burningham and Thrush, 2004; Castan-Broto et al., 2007; Cutchin et al., 2008; McGee, 1999; Phillimore and Moffatt, 2004; **Venables et al., 2012**). The approach these studies take emphasises the negative connotations associated with the effect that industrial pollution and environmental deterioration have on residents' quality of life. However, some of them, from a qualitative methodology, also explicitly highlight the economic benefits of these complexes as compensatory for poor physical environment and the negative consequences of installation closures, generally in terms of job losses (Atari et al., 2011; Baxter and Lee, 2004; Burningham and Thrush, 2004; McGee, 1999). Local communities want a clean and healthy environment, but are also interested in economic/industrial development that provides employment (Azapagic, 2004). The evaluation of these economic issues has a leading role to play in times of crisis, a fact that is clearly reflected in the work of Burningham and Thrush (2004: 228), who note in reference to a community located in the surroundings of a chemical complex: "this community had been built around local industry which provided jobs, investment and a sense of local purpose and identity. Industrial employment had, however, been declining in the area for years, threatening individuals' livelihoods and the whole community. In this context the remaining industry was vigorously defended".

The combined evaluation of these two dimensions – economic (benefits) and environmental (costs) – and their impact on residents' behaviour is an important issue that has not been sufficiently addressed in the literature, especially with regard to the quantitative assessment of their simultaneous effect. Furthermore, the literature reports that human behaviour is affected not only by cognitive processes, but also by affective processes (Brief and Weiss, 2002; Choi et al., 2011; **Koenig-Lewis et al., 2014**; Nyer, 1997). As well as understanding residents' judgments of the phenomenon studied, it is also essential to understand their affective responses in order to fully appreciate how their daily experiences and well-being are shaped (Atari et al., 2011; Davidson and Milligan, 2004). **Improved understanding of how local residents interpret their day-to-day reality should help to facilitate better environmental management by both the companies and the public authorities involved. Indeed, engagement with the local community has been widely highlighted in the literature as a way of reducing firms' conflicts with the surrounding community (Que et al., 2015; Raufflet et al., 2014), including the psychological and social concerns of residents (Atari et al., 2011; Luginaah et al., 2002a).**

Literature in the field of psychology reflects conflicting views on the relationship between cognitive and affective processes, both regarding their treatment as separate processes and in the causal relationships between them (Eder et al., 2007). Specifically, we adopt the cognitive appraisal theory (Lazarus, 1991; 1999; Nyer, 1997; Roseman et al., 1990; Roseman and Smith, 2001) to propose, in the context of a specific petrochemical industrial estate located in Castellón (Spain), that residents' cognitive appraisal of the economic and environmental aspects leads to their affective responses, and both elements – cognitive and affective – jointly explain their behaviour. The reasons for this choice are defended in the next section, where we develop the theoretical framework on which the hypotheses are based; this is followed by

an explanation of the methodology and results. The final section analyses the results and reports the main conclusions drawn from them.

2. Theory development and research hypotheses

The effects of environmental contamination on citizens' health have been extensively documented in the literature (Gouveia and Maisonet, 2005; Pope and Dockery, 2006; Legot et al., 2012; **Pascal et al., 2013**: Utell et al., 2005). Beyond the awareness of residents about the cause-effect relationship between industrial pollution and specific diseases, the potential exposure to contaminants create uncertainty around this issue resulting in a perception of risks contributing to undermine citizens' welfare and quality of life **(Boardman et al., 2008; Li et al., 2014).** Furthermore, some studies have analysed these issues in the specific context of petrochemical complexes (**Atari et al., 2011; Axelsson et al., 2013**; Bhopal et al., 1988; Cutchin et al., 2008; **Kondo et al., 2014; Kongtip et al., 2013**; López-Navarro et al., 2013a; **2013b**; Luginaah et al., 2002a; 2002b; Phippimore et al., 2000; **Tortosa et al., 2014**; Yang et al., 2002). These complexes, frequently located in port areas close to cities, constitute an important focus of contamination through contact with chemical substances dumped into the water, air or soil. Occupational exposure studies have been frequently developed in order to analyse the risk perception and the health effects in workers of those facilities (Kao et al., 2008). However, the potential exposure to a large set of chemicals may also be substantial for inhabitants living in nearby residential zones during the production and refining of crude oil and derivates, seriously affecting their health and well-being (**Kongtip et al., 2013**; Nadal et al., 2011; Signorino, 2012).

On the other hand, and from an economic perspective, petrochemical complexes usually comprise a wide range of companies that are likely to have a significant economic impact in their area of influence. The concentration of these companies in port areas comes as a result of

the technical conditions of shipping transport, as well as the agglomeration economies arising from the location in a geographical area of companies with highly interrelated activities (**Cerceau et al., 2014**; Martinez, 1983; **Merk, 2011**). These agglomeration economies generate economic benefits for the companies and, by extension, for the area in which they are located (Chertow et al., 2008). In this type of geographical location, paradoxically, growth in economic activity **may be related to** increased levels of pollution, since petrochemical complexes tend to attract other similar companies **potentially hazardous**, while at the same time they **may hinder** diversification that would bring in companies from cleaner industries. This phenomenon is clearly illustrated in Phillimore and Moffatt (2004:180) who, referring to the Teesside petrochemical complex and Banks's study (2000), state: "as some of Banks's (2000) interviews make apparent, chemical industry executives see one of the area's attractions as stemming from the population's experience of –and tolerance of – an industry that might face more of an uphill struggle in a setting with less historical familiarity. Thus, the difficult balancing act for those concerned with economic regeneration is to try to be both 'green and clean' for diversification and simultaneously a place where continued petrochemical investment is welcome".

This conflicting effect between environmental and economic dimensions, and the impact it has on individuals, is clearly reflected in the work of Cañizares (2004), when she speaks of a dual conception of fear. On the one hand, fear of environmental contamination that may also cause situations of life-threatening danger for the local population; and on the other, fear of socio-economic catastrophe, in other words recession (unemployment) if the economic activity is relocated. Although the combined effect of environmental and economic aspects associated with specific polluting industrial complexes has been dealt with in the literature, to our knowledge there are no empirical studies that quantify their combined impact

simultaneously. For this reason, we consider this topic to be a relevant area of research deserving of in-depth analysis.

As well as its usefulness in terms of sociological analysis, our approach from the local community's perspective is also particularly interesting from the point of view of companies' and public authorities' environmental management. A greater understanding of how the local residents interpret their day-to-day reality, from both cognitive and affective perspectives, should improve the quality of decisions taken in this scenario. In the present context, the companies' stakeholders, including the local community, expect the companies to act responsibly (Raufflet et al., 2014). To a certain extent, the company is expected to take into account the impacts of its activities on all its stakeholders and honour the "social contract" between business and society (Du and Vieira, 2012). As Bremmers et al. (2007: 217) suggest, "people living in the neighbourhood of a company will promote goals such as clean air, absence of noise and/or avoidance of direct dangers resulting from firm operations (...) inhabitants are powerful, for they have possibilities to involve the media and local government agencies in support of their goals". The role of the public authorities is therefore particularly significant in the case of potentially polluting industrial estates. Residents perceive the industrial complex as a whole and problems of sustainability cannot be tackled through an approach that views each company individually (and environmental regulations are usually established at company or industrial facility level); rather, what must be considered is the sum total of companies in the cluster and the accumulated effects that could occur in the geographical area in which the cluster is located (Waage et al., 2005).

As we noted in the introductory section it is necessary to examine cognitive and affective processes to gain a more comprehensive understanding of residents' behaviour. The relationship between cognition and emotion or affect has given rise to opposing positions in

the psychology literature. Cognitive appraisal theory (Lazarus, 1991; 1999; Nyer, 1997; Roseman et al., 1990; Roseman and Smith, 2001) holds that emotions are elicited by cognitive appraisals, and they act as mediator between cognitive appraisals and human behaviour. Lazarus (1991: 144) defines appraisal as the "continuing evaluation of the significance of what is happening for one's personal well-being". The cognitive appraisal of the situation "leads to a subjective experience (affect)" (Nyer, 1997: 297). Affect refers to the negative or positive subjective emotional experience associated with external events and objects or internal representations (Finucane et al., 2003; Gooty et al., 2010). To date, a wide range of studies have provided strong empirical support for this theoretical approach (Butt and Choi, 2006; Choi et al., 2011; Koenig-Lewis et al., 2014; Kuppens et al., 2003; Roseman and Evdokas, 2004; Smith and Kirby, 2009a; 2009b; Tong et al., 2007; Weibel et al., 2011). **However, other studies (e.g., Finucane et al., 2000; Lerner and Keltner, 2000; Slovic et al., 2004) prioritise the role of affects and argue that they are what influence cognition appraisals, according to previous studies by Zajonc (1980; 1984).** Indeed, it seems reasonable to assume that affect can influence or modulate the way information is processed and, in consequence, cognitive appraisals –some studies, for example Forgas (1995; 1998) or Martin and Kerns (2011), note that people in a positive mood tend to evaluate events more favourably. Far from being incompatible, the two approaches could converge in a sequential interdependence between cognition and affect, and consideration of such an interactive process removes the dilemma about which is the dominant process (cognitive or affective). In one of his later papers, Lazarus (1999) argued that the continuous interaction of the two elements enables human behaviour to be properly understood. Likewise, Storbeck and Clore (2007: 1230) also indicate that "affect and cognition should be thought of as fundamentally interactive". Whatever the case, the literature states that the idea of a cognitive approach is now firmly at the centre of any articulated understanding of emotion (Oatley et al., 2011), and

consequently emotions and affects can be studied from cognitive paradigms (Eder et al., 2007; Moors, 2007; Storbeck and Clore, 2007).

As we noted in the introduction we adopt the cognitive appraisal theory to develop a model that evaluates the combined effect of economic and environmental aspects on residents' behaviour. As Eder et al. (2007: 1139) noted, a "reason for a strong reliance on cognitive paradigms in affective research was the apparent success of cognitive methods in the explanation of human reasoning and behaviour". From this theoretical approach, we propose that residents' affects are constructed on a cognitive basis, which is also consistent with previous studies on communities and petrochemical complexes (Axelsson et al., 2013; Taylor et al., 1997) and both elements determine their behaviour. This relationship should be understood within the framework of the above-mentioned interactive sequence between cognition and affect. In the context of appraisal theory, emotions and affects are understood to be dynamic, undergoing changes as new appraisals are added or revised (Reisenzein, 2001), although this point is often misunderstood by non-appraisal theorists (Nerb, 2007). Given their experience as residents in the vicinity of the petrochemical complex analysed, and as a result of events that may have taken place (expansion and job creation processes, accidents, spills, fairly constant odour episodes, etc.), it is reasonable to assume that continuous appraisals over time about the economic benefits and environmental costs of the complex will have led to the formation of a relatively stable and lasting affects towards the complex. Furthermore, when we analyse affects in our study, we are not evaluating people's mood states – generally used in the literature to assess the impact of affects on cognitive processes – that may have a more or less evident impact on any of the cognitive processes that the individual faces. Our analysis, as regards affects, is limited to the specific affects the individual experiences as a result of a specific circumstance, namely, his or her residence in

the vicinity of a petrochemical industrial complex and the appraisals he or she makes about the economic benefits and environmental costs associated with this complex. For this reason the cognitive appraisal of these aspects undertaken in the present study may largely be determined by the person's previous accumulated information (and, although not considered in this study, by his or her specific configuration of needs, goals, resources, abilities, etc. (Smith and Kirby, 2009a)). These experiences and how they are appraised give rise over time to an affective reaction to the complex – which is what we aim to assess – that has a connotation of stability/durability. For all these reasons we consider the choice of our theoretical approach is justified.

Regarding human behaviour, a reliable measure is difficult to obtain and for this reason, the literature has traditionally used the behavioural intent variable. Specifically, Oliver (1997: 28) describes behavioural intentions as "a stated likelihood to engage in a behaviour". In fact, it has been considered the best predictor and therefore, the most reliable measure, since the factors that determine intention are the same as those that can explain the behaviour (Ajzen, 1991; Oliver, 1997). Nonetheless, the literature also cautions that although intention is the direct antecedent of behaviour, it may be an imperfect predictor, since the final behaviour may be influenced by contextual factors that alter the original intentions (Chandon et al., 2005).

An overview of the influence of cognitive appraisal on residents' behaviour

According to the above, local communities living near petrochemical complexes are concerned about firms' ecological impacts, but simultaneously they are also dependent on firms for jobs and economic growth. Atari et al. (2011: 486) in a study of the petrochemical area of Sarnia (Canada), noted that historically the pollution problems did not resonate with

residents "probably because air pollution was considered a trade-off for economic affluence", a result that is consistent with the study of Beynon et al. (1994) in the case of Teesside (UK). The cost (environmental)-benefit (economic) model may be a standard approach for analysing a person's behaviour (Chung et al., 2008). According to Taylor-Gooby and Zinn (2006: 397), "the most important approach in mainstream psychology might be termed the 'cognitive/learning' perspective. The central idea is that humans are more or less rational choosers, within the constraints of their capacity to reasoning and learning, the experiences to which they have access, and the context in which they live". Implicit in this approach is the assumption that individuals, in the pursuit of their well-being, make choices between different courses of action, evaluating the consequences and seeking to maximise the benefits and minimise associated costs (Koenig-Lewis et al., 2014). These decisions, however, are not necessarily conscious or rational; as Lazarus (1982: 1022) states, "the cognitive appraisal does not imply anything about deliberate reflection, rationality, or awareness".

Several contributions have followed a cost-benefit model (Kunreuther et al., 1990; Sjöberg and Drottz-Sjöberg, 2001) to analyse how a person cognitively appraises the benefits and costs associated with a locally unwanted facility, also known in the literature as LULUs (Popper, 1985). In this vein, some studies describe the benefits, based on economic indicators (Chung et al., 2008; Siedl et al., 2013), and the cost, through cognitive appraisal of the risk associated with the reality studied (Siegrist, 1999; 2000; Venables et al., 2012), in order to assess their impact on the degree to which the individual accepts that reality. Moreover, some previous research has also addressed the impact of cognitive appraisals associated with a geographic location in cost-benefit terms, as well as its impact on behaviour. Florida et al. (2010), for example, analyse the simultaneous impact of a wide range of variables associated with place of residence (including economic and environmental issues) on the probability of continuing to live in the present location or, in

other words, the intention to move to a different location. There is also an extensive literature on tourist destinations in which cognitive appraisals associated with geographical location –in terms of advantages and disadvantages– are associated with behavioural intentions, usually in terms of recommendations to others to visit or re-visit the destination (see, for example, Alén et al., 2007; Craggs and Schofield, 2011; or Yuang et al., 2008). The above leads us to the following hypotheses on the relationship between cognitive appraisal and behavioural intention:

H1: *The cognitive appraisal of economic impacts (benefits) deriving from the industrial complex activity has a positive impact on their behavioural intention towards their place of residence.*

H2: *The cognitive appraisal of environmental impacts (costs) deriving from the industrial complex activity has a negative impact on their behavioural intention towards their place of residence.*

The mediating role of affects

In the context of cognitive appraisal theory, several studies have revealed that emotions and affects emerge from the cognitive appraisal of the situation (Butt and Choi, 2006; Choi et al., 2011; Kuppens et al., 2003; Roseman and Evdokas, 2004; Smith and Kirby, 2009a; 2009b; Tong et al., 2007; Weibel et al., 2011). As Lazarus (1982) notes, humans are meaning-oriented, meaning-creating creatures who constantly evaluate events from the perspective of their well-being and react affectively to some of these evaluations. A positive appraisal of the event will lead to positive affects such as content, satisfaction or pleasure. In contrast, negative judgements will lead to negative affective responses like fear, worry or anxiety. Diener et al. (2010) state that subjective well-being is conditioned by the existence of both

positive and negative affects and, in line with other studies (see, for example, Choi et al., 2011), we consider both types of affects in our research.

In regard to the specific literature on petrochemical or similar hazardous industrial complexes, we are unaware of any studies that address the mediating role of affects as raised in this paper. However, some studies more or less explicitly recognise the existence of a relationship between cognitive appraisals and affective response, particularly regarding environmental appraisals and negative affects. Cutchin et al. (2008: 590), for example, noted that appraisal of risks associated with industrial production of synthetic chemicals, "commonly translate into a generalized stress or into more specific emotional responses such as a fear" (p. 590). Boardman et al. (2008), from the perspective of environmental risk and stress literature, characterise industrial activity as a hazardous condition and ambient stressor. Axelsson et al. (2013), in the context of a petrochemical area, analyse the relation between odours and annoyance/worry and conclude that living in close proximity to petrochemical industries implies a greater annoyance and worry about the possible health effects from the industry. Taylor et al. (1997) and Steinheider and Winneke (1993) also analyse and confirm this odour-annoyance relationship. Although these studies establish a relationship between cognitive (environmental) appraisals and negative affects considered on a one-dimensional level, we understand that it is reasonable to assume, according to the explanation at the end of the previous paragraph, a relationship between cognitive appraisal and affects in a two-dimensional level -positive and negative. And the same reasoning would apply in the case of the relationship between the cognitive economic appraisal and such affects – positive and negative. Indeed, studies have indicated that positive and negative affects tend to comprise independent dimensions and exhibit distinct functions with regard to human behaviour (Larsen and Diner, 1992; Posner et al., 2005). As a result of the above, we propose the following hypotheses:

H3a: *The cognitive appraisal of economic impacts (benefits) deriving from the industrial complex activity positively influence residents' positive affects.*

H3b: *The cognitive appraisal of economic impacts (benefits) deriving from the industrial complex activity negatively influence residents' negative affects.*

H4a: *The cognitive appraisal of environmental impacts (costs) deriving from the industrial complex activity positively influence residents' negative affects.*

H4b: *The cognitive appraisal of environmental impacts (costs) deriving from the industrial complex activity negatively influence residents' positive affects.*

In this conception of affects as mediators, research has found that affective reactions have a considerable impact on individuals' behaviour or their behavioural intentions (Butt and Choi, 2006; Choi et al., 2011; Koenig-Lewis et al., 2014). In other words, the individual's actions will be congruent with and determined by the affective responses experienced. Affects can therefore be strong motivators, encouraging individuals to take action to approach or avoid a particular state (DiEnno and Leigh-Thompson, 2013). As Atari et al. (2011) and **Luginaah et al. (2002a)** suggest, in a similar context as our research, residents use their affective experiences to adopt appropriate strategies and behaviours to live within a contaminated community. Thus, we propose the following hypothesis:

H5: *Residents' positive affects have a positive impact on their behavioural intention towards their place of residence.*

H6: *Residents' negative affects have a negative impact on their behavioural intention towards their place of residence.*

When estimating the model proposed in figure 1, we will also take into account any significant differences between the total effects of both dimensions – economic and environmental – on residents' behavioural intention in order to accurately evaluate their relevance. **The issue of the economic benefits, usually in terms of employment and development, is explicitly highlighted in various studies analysing the impact of hazardous facilities from the local community perspective (see, for example, Atari et al., 2011; Baxter and Lee, 2004; Burningham and Thrush, 2004; Gamero et al., 2011). However, none of these studies quantitatively analyses the simultaneous effect of the two dimensions and the weight of each one of them. In the absence of any previous compelling literature that allows us to assume a greater or lesser weight of one sequence over the other, we do not formulate any hypotheses on this question.**

Furthermore, we will also assess the extent to which the weight of the hypothesised relationships varies according to proximity of residence to the petrochemical industrial complex. **Various studies have shown the negative effect that pollution associated with industrial activity can have on residents living in the vicinity of a complex, which causes higher concern or perceived risk (Boholm and Löfsted, 2004; Hung and Wang, 2011; López et al., 2013b; Luginaah et al., 2000; Moffat et al., 2003). However, other studies in the literature find that the residents living close to a potentially polluting site show lower concern or perceived risk, or a higher acceptance (Baxter and Lee, 2004; Greenberg and Schneider, 1996; Greenberg, 2009; Parkhill et al., 2010; Venables et al., 2012). The reasons given to explain this favourable disposition include the influence of the economic benefits associated with the site (Baxter and Lee, 2003; Krannich et al., 1993), or the coping strategies that residents adopt such as refusing to think about the facility, having faith that all is well, or denying the threat (Atari et al., 2011; Luginaah et al., 2002a). Due to the lack of consensus in the literature, we also consider it inappropriate to**

propose any hypotheses on the causal relations of the model regarding the proximity of the residents to the industrial complex analysed.

Insert Figure 1

3. Methodology

3.1. Sample description

We tested the structural model by administering a questionnaire to a representative sample of residents. The data were gathered in a specific geographical location, covering the areas influenced by the Serrallo petrochemical estate, located in the municipal district of the city of Castellón, in the north east of Spain (UTM coordinates: X-755 803, 688 Y-4426958, 037). Today this complex, covering an area of 3.635.400 m^2, accommodates nine companies, most of them belonging to the petrochemical sector. The main companies in the state are an oil refinery, a chemical company (producing caprolactam, fertilisers, liquid manures and ammonium sulphate) a electricity generating company, a company retailing liquefied petroleum gas, a plant for grinding clinker and processing cement, and a vegetable oil-based biodiesel production plant. There also some other companies serving them in transporting and storing, waste treatment and a public terminal for the unloading, storage and dispatch of bulk goods. In addition, the installation of a total of seven new firms is now being projected: a concrete manufacturer; a biodiesel and/or vegetable oil and bulk storage depot; a planned logistics hub for raw materials and finished products connected to one of the firm's facilities on the original estate; a plant for the manufacture of plant nutrients and fertilisers; facilities for the storage and logistics of bulk solids and liquids; a plant for the reception and storage of

liquid waste generated by ships; and finally a product discharge point on the dyke enclosure connected to the facilities of the main refinery. The design of this new infrastructure means that this complex is still in growing, with the aim of maintaining its industrial activity for a long time. In 2011 the main three companies on the industrial estate, that is, those located solely in Castellón, reported joint revenues of 6,393,628,008 Euros, a figure that reflects the significance of their economic activity. In addition, all the companies in the complex generate over 5000 jobs, accounting for direct and indirect employment; 97% of these workers have a high level of education (Eco-audit, 2012).

The field work was carried out in March and April, 2011, in order to concentrate responses in a short space of time. Personal street interviews were conducted with residents to complete the questionnaire. A total of 992 valid responses were obtained using simple random sampling. Of these responses, 542 (54.6%) were from women and 450 (45.4%) from men. The majority of the respondents reported an age of between 26 and 45 (48.4%); young surveyed, from 18 to 25 years, were 128 (12.9%); respondents from 46 to 65 years were 286 (28.8%), while the lowest age range represented was the over 65 bracket, 98 interviewees (9.9%). Lastly, a total of 521 (52.5%) respondents reported an intermediate level of education, 307 (30.9%) a lower level and 164 (16.6%) a higher level of formal education.

According to official Spanish census data (INE-2011), the total population of the localities surveyed is 42,086, which for a 95% confidence level, represents a sample error of +- 3.10% (p=q=0.5) for the whole sample.

3.2. Statistical procedure

The model was empirically validated using Structural Equation Modelling (SEM), which represents a set of integrated multivariate techniques such as factor analysis, regression, path analysis or simultaneous equation modelling (Hou et al., 2014). SEM

has been used in research on environmental sustainability (Hussey and Eagan, 2007; Jakhar, 2015; Li et al., 2014; Llach et al., 2013) or risk perception literature (Sparrevik et al., 2010). Nowadays SEM is considered to be one of the most sophisticated methods to assess the causal relationships among multiple variables based on cross-sectional data, because it incorporates both latent and observable variables, and because it includes measurement errors (Byrne, 2001). It also allows one latent variable to be a dependent variable in one set of relationships, and at the same time it can be an independent variable in another set of relationships (Hou et al., 2014). SEM is therefore a suitable methodology to test, in a single model, our hypothetical model that involves the relationships between cognitive (economic and environmental) appraisals, positive and negative affects and residents' behavioural intention.

To implement this method, we used the EQS 6.2 (Bentler 1995) statistical software package, with the maximum likelihood estimation method. To evaluate the goodness of fit of the models, given the possible non-normal distribution of the data analysed, we used the Satorra-Bentler scaled Chi-square statistic (Bentler 1995; Bentler and Dudgeon 1996; Satorra and Bentler 1994), following previous studies that have used this modification of the statistic (Bou-Llusar et al., 2008).

3.3. Measurement scales

The measurement scales used were taken from the existing literature and subsequently adapted to the objectives of this study. To measure all the constructs, respondents were asked to indicate their level of agreement with the proposed statements, choosing a value on a five-point Likert scale, where 1 represented the lowest agreement with the statement ("totally disagree"), and 5 the highest ("totally agree").

The items used to measure the two cognitive appraisals scales were adapted from studies by Azapagic (2004), Bebbington et al. (2007), Chang et al. (2009), Johnson et al. (1994) and Krajnc and Glavic (2003). Specifically, *Economic Appraisals* were evaluated by means of a five-item scale, related to job creation, level of income, public funds, road infrastructures, and investments to improve quality of life of the community. *Environmental Appraisals* were also assessed with a five-item scale, regarding atmosphere contamination, noise pollution, unpleasant odours, waste discharge and landscape beauty.

***Positive and Negative Affects* were measured with four items in each case. They were based on the studies by Singh et al. (2008), ter Huurne and Gutteling (2009), and Yang et al. (2011). *Positive Affects* were assessed through residents' feelings of financial security, pleasure, optimism and content. *Negative Affects* were evaluated through their feelings of tension, worry, annoyance and fear.**

Finally, in order to measure the citizens' *Behavioural Intention* towards their place of residence, and drawing from the literature on consumer and community satisfaction, and tourism destinations (Craggs and Schofield, 2011; Florida et al., 2010; Martin et al., 2008), we defined a scale with three items that assessed the likelihood that residents would recommend the place, defend it publicly and move elsewhere.

Prior to drafting the definitive questionnaire with all the items, we carried out a series of in-depth interviews in order to adapt the final questionnaire that we would use to obtain residents' assessments. These interviews were held with appropriate members of the community who represented the various stakeholder groups in the area (two employees from the petrochemical industry, a representative of the fishing sector and several members of a local neighbourhood association). We adapted the original scales according to the experts' suggestions in order to get a first version of the questionnaire. This version was pre-tested and

it provided quantitative data in the form of assessments with the proposed scales, and qualitative data, from the analysis of opinions and more formal issues of the questionnaire. The final version of the items included in the questionnaire is provided in the appendix.

4. Results of the empirical study

4.1. Validation of the scales

To ensure the dimensionality, reliability, and the convergent and discriminant validity of all the scales used in the study, we performed the series of analyses described below. We followed the two-step approach proposed by Anderson and Gerbing (1988); the first step consisted of a study of the dimensionality, reliability and validity of the scales. This analysis allowed the scales to be refined by eliminating non-significant items, using Confirmatory Factor Analysis with the Structural Equations Modelling (SEM) technique. In the second step, the causal structure was established, enabling the causal hypotheses to be tested.

Dimensionality

The dimensionality of the scales was verified using an overall Confirmatory Factor Analysis for all the items of the model, taking into account the variables of each one of the items. The goodness of fit of the model for the CFA (see table 1) was above the recommended values in all cases (χ^2S-B(176)=763.8206; CFI=0.948; RMSEA=0.058; BBNFI=0.933; BBNNFI=0.938), verifying that each item only forms part of its corresponding variable. The Lagrange multiplier test was also used to detect possible correlations among the errors associated with the items, in order to improve the fit of the model. Correlations were detected between items NEG1-NEG4 and items NEG3-NEG4 from the negative affects scale, and also between items ECON4-ECON5 from the cognitive appraisal of economic impacts scale.

Insert Table 1

In addition, item ECON4 of the economic appraisal scale was removed (indicated in table 1 and appendix) since its factor loading was below 0.50, which leads to problems in the reliability of the model (Bagozzi, 1980; Bagozzi and Yi, 1988; Hair et al., 2006). Item ECON5, also in the economic appraisal scale, was also removed despite having a factor loading slightly above 0.50 (0.51), as its inclusion in the model appreciably deteriorated the discriminant validity of cognitive appraisal of economic impacts variable.

In summary, the cognitive economic appraisal scale was reduced to 3 items, while the cognitive environmental scale retained its 5 original items. The positive and negative affects scales were not modified, each with 4 items and the residents' behavioural intention scale also remained the same with 3 items. The goodness of fit of this new model (after removing the two items) remained above the recommended values in all cases (χ^2S-B(140)=579.6397; CFI=0.961; RMSEA=0.056; BBNFI=0.949; BBNNFI=0.952)

Reliability

Cronbach's alpha (Cronbach, 1951) and composite reliability (Fornell and Larcker, 1981) were used to confirm the reliability of the scales. Table 1 presents the values of the two indicators for each scale. Values are above the recommended minimum of 0.7 in all cases (Bagozzi and Yi, 1988), with the scales for positive and negative affects presenting notable values equal to and above 0.9, respectively.

Convergent and discriminant validity

Convergent validity was evaluated using the Bentler-Bonett normed fit index (BBNFI) (Bentler and Bonett, 1980). The BBNFI is the index of the difference between the Chi-square of the model minus the Chi-square of the null model (the independent model in which all correlations are equal to zero), divided by the Chi-square for the null model. A BBNFI over 0.90 indicates strong convergent validity (Ahire et al., 1996).

In addition to this analysis, the average variance explained (AVE) of three of the constructs of the model is higher than the recommended minimum of 0.5 (Fornell and Larcker, 1981), and is particularly high in the case of positive affects (0.86). The AVE for the other two cases –the cognitive environmental appraisal and the residents' behavioural intention– were 0.48 and 0.47, respectively, both very close to the cut off point. Overall, even though AVE of these two dimensions was less than 0.5, they were retained due to content validity and discriminant validity that satisfy the criteria of validity and reliability. (Bartram and Casimir, 2007; Roostika, 2011; Vlachos and Vrechopoulos, 2008). Considering the cut-off value for the BBNFI and the recommended value for the AVE, displayed in table 1, the model analysed presents a high level of convergent validity.

Finally, the discriminant validity of the entire model was confirmed by verifying that the square root of the AVE of all the variables of the model was greater than its correlation with the other variables, as shown in table 2. In light of the above, the convergent and discriminant validity of the variables included in the model are demonstrated.

Insert Table 2

Descriptive statistics

Prior to analysing the structural model, note that table 1 shows the averages and the standard deviation for each item. In table 2 the correlations between each of the variables are reported, and in all cases these are different from zero, and positive or negative in accordance with the nature of each of the variables (see the appendix).

4.2. Results of the structural model

After refining the scales, the empirical testing of the model concludes with the analysis of the relationships hypothesised that make up the proposed model. The last row of table 3 reports the goodness of fit indexes for the structural relationships model proposed. All the values of these statistics were adequate, thus verifying the model's suitability for the sample. In summary, this demonstrates that the structure of the relationships among variables proposed to explain residents' behavioural intention is valid for the dataset obtained.

Insert Table 3

Table 3 shows the estimated parameters and the t-tests corresponding to the weightings of each of the relationships considered in the model explaining residents' behavioural intention. Regarding the effect of cognitive appraisals on residents' behavioural intention (Hypotheses 1 and 2), the results of our estimation support Hypothesis 1, which posed a positive relationship between cognitive appraisal of economic impacts and residents' behavioural intention ($\beta=0.087$; $p<0.05$), but not Hypothesis 2, which predicted a negative relationship between

cognitive appraisal of environmental impacts and residents' behavioural intention (β=-0.026; p>0.05).

Regarding the hypotheses that specified cognitive (economic and environmental) appraisals as a significant predictor of positive and negative affects towards the petrochemical complex (H3a, H3b, H4a and H4b), our analysis specifically supports the relationship between cognitive economic appraisal and positive affects (H3a: β=0.199; p<0.05), and the relationships between cognitive environmental appraisal and (negative and positive) affects (H4a and H4b; β=0.447 and β=-0.194, both p<0.05, respectively). However, the relationship proposed between cognitive economic appraisal and negative affects (H3b) was not supported (β=-0.056; p>0.05).

Hypotheses 5 and 6, which established a relationship between (positive and negative) affects and residents' behavioural intention, were supported by our analysis (β=0.212 and β=-0.490, both p<0.05, respectively).

Table 3 also shows the indirect effects of cognitive (economic and environmental) appraisals on the behavioural intention towards place of residence via both positive and negative affects, revealing that the indirect effect on behavioural intentions is stronger in the case of cognitive environmental appraisal (β=-0.260; p<0.05) than in the case of cognitive economic appraisal (β=0.069; p<0.05).

Finally, the results of the coefficient of determination for residents' behavioural intention (R^2= 0.339) reveal that the four antecedent variables considered explain 33.9% of the variance of the behavioural intention. The variance of the other two dependent variables –positive and negative affects– is explained by the cognitive (economic and the environmental) appraisals, with values of 7.7% and 20.3%, respectively. In the first case, the relatively low coefficient of determination lead us to suggest that future research should identify other variables of a

different nature that would more efficiently explain the variance in the positive affect of residents living near industrial estates.

Having noted these findings, we conducted an additional analysis to observe the difference in the influence of each kind of cognitive appraisal on behavioural intention. For this purpose, we analysed, according to MacKinnon (2002) the total, direct and indirect effects of cognitive (economic and environmental) appraisals on the behavioural intention (table 4), noting that the cognitive environmental appraisal has a greater weighting than the economic one.

Insert Table 4

4.3. Multigroup analysis of the model based on the distance from the petrochemical complex to the citizens' place of residence

We also analysed the influence of proximity of place of residence to the industrial estate on citizens' evaluations. Specifically, we divided the sample into those living in neighbourhoods immediately adjoining the petrochemical complex, and those living at a greater distance, but also located in the area of influence of the complex.

We conduct a multi-group analysis to assess whether the model produces the same results for both samples. To ensure configural invariance, and after conducting a Lagrange multiplier test and observing the univariate increments of the χ^2, we removed items ENV4 and ENV5 from the environmental appraisal scale before proceeding with the test of invariance, as they presented different behaviour in the two models. After this amendment, the goodness-of-fit indices for the multi-group model ($\chi^2(220)=501.9118$; CFI=0.972; RMSEA=0.051;

BBNFI=0.951; BBNNFI=0.965) showed a good fit to the data, indicating the existence of configural invariance (Vandenberg and Lance, 2000); that is, the same model could be applied to each sub-sample.

Table 5 shows the parameter estimates for the causal relationships of the model. The coefficients are statistically significant and in both sub-samples, except for the relationship between cognitive environmental appraisal and behavioural intention, which is not significant for those living far from the complex. Nonetheless, the causal effects are higher for those living in neighbourhoods immediately adjoining the industrial area than for those living at a greater distance. Overall, an almost equal pattern of interrelationships is observed in the two sub-samples, with minor differences in the coefficients.

Insert Table 5

To learn whether differences between sub-samples are statistically significant, we first test for invariance in the measurement instrument. To do this, we compare the multi-group model with one in which the loading of the items are constrained to be equal across groups. The result of this invariance test was statistically non-significant ($\triangle\chi^2$=24.6594; $\triangle$d.f.=12; p=0.066), showing that there are no differences between the two models compared.

We then test for structural invariance. We compare the multi-group model with a nested model in which the structural relationships are constrained to be equal across groups. The chi-square difference tests for the multi-group model show the invariance test to be statistically significant ($\triangle\chi^2$=30.8638; $\triangle$d.f.=8; p=0.000). These results reveal differences between

people living in neighbourhoods immediately adjoining the industrial area and those living a greater distance in the explanatory model of the behavioural intention.

Furthermore, the results of the univariate increment of the χ^2 (for each relationship) at the Lagrange multiplier test, show that significant differences are concentrated in the relationships of the positive and negative affects with the residents' behavioural intention. Non-significant differences were found in the other causal relationships. This result was to be expected from a comparison of the parameter estimates in Table 5, which had very similar values. Moreover, as can also be seen in Table 5, when the two groups were considered separately substantial differences were found in the R^2 values. Specifically, in the case of those living at a greater distance from the petrochemical complex the explained variance of behavioural intention is 25.6% (R^2 = 0.256), a value that increases to 52.8% (R^2 = 0.528) when we consider citizens whose neighbourhoods adjoin the petrochemical industrial complex. Therefore, the model presented here better explains the behavioural intention of citizens living closer to the plant.

5. Discussion and conclusions

Environmental quality is one of the most relevant elements that determines people's satisfaction and well-being. As a result of constant international economic growth, the problems deriving from the depletion of resources and environmental degradation have in recent years become highly relevant and controversial questions, and are raising citizens' awareness of the importance of correct environmental protection.

The geographical concentration of business activities leads to economies of agglomeration, generating benefits for the companies involved and economic wealth for the surrounding area. However, the concentration of certain types of industrial activities can generate significant negative externalities in terms of environmental contamination, which negatively affects the

health and well-being of local residents. When industrial complexes making a significant contribution to the local economy dominate an area, environmental issues are frequently pushed into the background, particularly in times of recession.

The present study is the first to empirically corroborate, in the context of a specific petrochemical complex located in Spain, the combined effect of the cognitive appraisal of economic and environmental impacts on residents' affective response, and how both cognitive and affective response condition their behavioural intention. First, the study results show that both cognitive appraisals and affective responses determine residents' behavioural intention towards their place of residence, lending support to the literature arguing that both dimensions – cognitive and affective – need to be considered when analysing human behaviour (see, for example, Choi et al., 2011).

Secondly, the results also indicate that cognitive appraisals determine affective responses, so that the affects exert a mediating role between cognitive appraisals and residents' behavioural intentions in line with that indicated by other studies, although in fields other than those addressed in this paper (Butt and Choi, 2006; Choi et al., 2011; Koenig-Lewis et al., 2014). More specifically, residents' cognitive appraisal of the economic benefits associated with the industrial complex generates positive affects, while the residents' cognitive appraisal of environmental costs generates negative affects and reduces positive affects. While we do not deny that cognitive assessment may be conditioned by affective aspects associated with each individual –moods state can influence or modulate cognitive appraisals, the results of the study show that the outcome of cognitive appraisal, derived from past events residents have experienced in their ongoing day-to-day relationship with the petrochemical complex, generate a stable and lasting affective response over time to the complex that has a considerable impact on their behavioural intention towards their place of residence. Furthermore, the effect of negative affects on residents' behavioural intentions towards their

place of residence is larger than of positive affects. The study, therefore, coincides with the aforementioned contributions that defend the decisive role that the affective dimension has on individuals' behaviour.

A third important finding of this study is the evidence of the different intensity of the two considered dimensions –economic and environmental; although both dimensions are relevant to explain residents' behavioural intention, the environmental side has a significantly higher total weight than the economic one. This finding seems to indicate that the local community prioritises environmental issues over economic questions; and this supports the argument that the damage of a loss (environmental costs) tends to be weighted more highly than the benefits (economic consequences). Beyond the importance of the petrochemical industrial complex to the economic activity of the area, and despite the difficulties for industrial diversification at this petrochemical complex, the incidence of environmental appraisals (the effects on people's health are well documented in the literature, as pointed out in the literature review) and the negative affects deriving from them are of greater consequence in determining the behavioural intentions of the local community. Furthermore, the study results reveal that the direct influence of cognitive appraisals on behavioural intention is less than their indirect influence through the affective response. These results appear to verify coinciding with the findings of Atari et al. (2011) and Luginaah (2002a) that residents use their affective experience to adopt appropriate coping strategies to live within a contaminated community.

Fourthly, the results also identified a different influence regarding the relationship between affects and behavioural intentions according to proximity of place of residence to the petrochemical complex. In this regard, we found an increased incidence of affects, both positive and negative, on behavioural intention among residents living closest to the petrochemical complex. **In considering affects from two dimensions (positive and negative) our study contributes to the literature by explaining in greater depth the**

residents' affective relationship according to their proximity to the complex. The closer proximity to the complex leads to a greater impact of negative affects on behavioural intention, although this could be offset to some extent also by the greater weight of positive affects. The greater weight of positive affects towards behavioural intention could be due to a defensive conduct that may be more pronounced among those living closer to the industrial complex. **Several studies have shown that citizens living in the immediate surroundings of contaminating industrial complexes emphasize other elements to counteract perceived concerns and environmental risks, which include the economic benefits (see, for example, Baxter and Lee, 2004; Krannich et al., 1993).**

The results have some relevant implications, both for the firms located in the complex and for the public institutions responsible for controlling their activities and planning regional development. The residents' negative affects deriving from the appraisal of environmental impacts of the industrial complex activities, and the more important role of environmental aspects than economic ones, highlight the need for the companies involved to improve their environmental management practices. Such practices play an important role in the context of an industrial complex where several potentially polluting companies are operating. Cumulative environmental impacts resulting from the firms' activity constitutes an important element of concern in the local community. In addition, there is also a possibility of opportunistic behaviour by any of the companies in matters of environmental nature. In an industrial complex such as the one analysed here, it can be extremely complex to assign responsibility to a specific company, for example, when an excess in the levels of a contaminant substance is detected; since environmental problems may be caused by numerous industrial firms, it is difficult to identify polluters (Saengsupavanich et al., 2009). It is precisely in a context like the present one that companies should redouble their efforts to what might be called "shared environmental corporate responsibility", collectively intensifying

their activities in the environmental field to ensure the welfare of the local community. Moreover, considering how environmental appraisals influence residents' behavioural intentions through affective responses, our results suggest, in line with Luginaah et al. (2002a), that companies' intervention may have to move beyond the focus on technological measures to reduce environmental externalities to address the psychological and social concerns of residents. Among other necessary actions, they should first ensure that the information on environmental management effected is fully understandable, and even involve the local community in this management (by listening to and adapting citizens' suggestions), in order to improve relations with residents.

This process also has implications for the public institutions responsible for controlling these companies' activities, particularly regarding emissions and other possible environmental contamination of the area. More efficient interventions are therefore required to guarantee that industrial activity is undertaken appropriately, by supervising companies' activities and establishing the necessary environmental controls to guarantee the health of local residents. This monitoring activity should avoid the possible opportunistic behaviours mentioned above. Moreover, its aim is not just to ensure that emissions of the companies installed remain below the legal limits, but that cumulative pollution does not exceed the limits considered safe to guarantee the health of the population. This issue can play a significant role in the expansion of the petrochemical industrial complex. Thus, the results should also prompt reflection on the part of the public institutions responsible for sustainable territorial planning regarding such expansions, which are often presented as necessary to maintain the levels of competitiveness of the industrial complex and of the companies located in it. Indeed, new companies, with a related industrial activity, are currently being considered for incorporation into the petrochemical complex analysed in this study. The very nature of an industrial complex is such that it acts as a magnet for new companies with links to the petrochemical sector, and it

is extremely complicated to develop initiatives that encourage diversification of the industrial activity, which hinders the flow of investment into other sector types. Aside from the possible economic effects they might have, the acceptance of new facilities in the cluster should be analysed carefully, since their contribution to the accumulated levels of pollution from the industrial complex could exceed the safety thresholds that guarantee citizens' health. In parallel, and in order to establish buffer zones, urban development should not be allowed near the petrochemical complex. In the past decade, a number of developments were built at a short distance from the petrochemical complex, which now constitute a permanent source of conflict. **Regarding aspects of environmental regulation, it is particularly important to consider the industrial complex as a single unit. Environmental regulations, either through soft instruments (in particular certified environmental management systems), or direct "command-and-control" instruments, are generally applied at company (or facility) level, but are not usually established on territorial or geographical bases. In this vein, it would be advisable to prioritise the development of regulations that consider the industrial complex as a whole and that define, as well as the emission limit values for the individual company (facility), the collective emission limit values. There are currently two monitoring stations in the area, but they only measure a very limited, and therefore clearly inadequate, number of contaminants.**

Furthermore, public authorities can and should act as intermediaries in the relationship between the residents and the businesses of the petrochemical complex, and ensure that two-way communication between them is fluid and constructive, especially from an affective perspective. In this line, the local public authorities should address the claims and suggestions from both the business sector and the citizens they represent.

Finally, although the results of our research are encouraging, they are tempered by the limitations of it. As the main limitation of our study, we must point out that the results

obtained are contingent on the context analysed. Consequently, we note that the results may not be generalisable, since they refer to a specific industrial state located in Spain. In further studies, the analysis of other hazardous industrial realities could be of interest to compare the results. Therefore, as this was a cross-sectional study we focused on the relationship that residents' cognitive appraisal of a daily reality can directly and indirectly have on their behavioural intention, through their stable and lasting affective response to this reality. Future longitudinal analysis could assess the sequential relationship of interdependence between cognitive and affective processes, as it is defended in one stream of literature, since both factors may act as an antecedent and consequence, respectively, depending on the sequence to be analysed**. A further limitation of our study is that it does not include socio-demographic factors in the estimated model, such as educational level, gender, etc. Future research might also usefully analyse epidemiological data to quantify the effect of the petrochemical complex on the health risk of local residents.**

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Appendix

Variable code	Definition
Economic Appraisals (ECON)	
ECON1	The industrial estate helps to create jobs in the area.
ECON2	The industrial estate generates a higher level of income among the residents of the area.
ECON3	The industrial estate results in higher public funds for the municipality.
ECON4[a]	The industrial estate means improved road infrastructures in the area.
ECON5[a]	The companies in the industrial estate invest some of their profits in improving the quality of life of the community.
Environmental Appraisals (ENV)	
ENV1	The firms in the industrial estate release gases and other contaminating substances into the atmosphere.
ENV2	The companies in the industrial estate cause noise pollution.
ENV3	The companies in the industrial estate produce unpleasant odours.
ENV4	The companies in the industrial estate discharge waste into the sea.
ENV5	The industrial estate spoils the natural beauty of the local landscape.
Positive Affects (POS)	
POS1	Living near this petrochemical complex makes me feel financially secure.
POS2	Living near this petrochemical complex makes me feel pleased.
POS3	Living near this petrochemical complex makes me feel optimistic.
POS4	Living near this petrochemical complex makes me feel contented.
Negative Affects (NEG)	
NEG1	Living near this petrochemical complex makes me feel tense.
NEG2	Living near this petrochemical complex makes me feel worried.
NEG3	Living near this petrochemical complex makes me feel annoyed.
NEG4	Living near this petrochemical complex makes me feel afraid.
Behavioural Intention Towards The Place Of Residence (INT)	
INT1	I would recommend my friends and relatives to move into the area where I live.
INT2	I would be willing to publically defend living in this area even though it may be controversial.
INT3	Even if I got an unexpected windfall (lottery prize, inheritance, etc.), I wouldn't move to live in another area.

[a]Items removed.

Table 1. Measurement model (dimensionality, reliability and validity of the scales)

Construct	Item code	Mean	Standard deviation	Standard loading	t-Statistic	Composite reliability tests
ECONOMIC APPRAISAL	ECON1	3.26	1.40	0.74	Fixed	AVE= 0.61
	ECON2	2.85	1.34	0.95*	20.04	CR= 0.82
	ECON3	2.78	1.33	0.61*	17.01	Cronbach's Alpha= 0.80
ENVIRONMENTAL APPRAISAL	ENV1	4.36	0.98	0.69	Fixed	AVE= 0.48
	ENV2	2.78	1.65	0.73*	14.65	CR= 0.82
	ENV3	3.83	1.52	0.73*	19.10	Cronbach's Alpha= 0.81
	ENV4	3.63	1.30	0.73*	17.13	
	ENV5	3.74	1.47	0.57*	14.02	
POSITIVE AFFECTS	POS1	2.34	1.41	0.86	Fixed	AVE= 0.86
	POS2	2.28	1.36	0.96*	47.42	CR= 0.96
	POS3	2.20	1.31	0.95*	44.03	Cronbach's Alpha= 0.96
	POS4	2.25	1.33	0.93*	41.03	
NEGATIVE AFFECTS	NEG1	2.40	1.35	0.92	Fixed	AVE= 0.69
	NEG2	2.71	1.50	0.87*	39.43	CR= 0.90
	NEG3	1.84	1.16	0.73*	25.85	Cronbach's Alpha= 0.90
	NEG4	1.99	1.29	0.78*	26.15	
BEHAVIOURAL INTENTION	INT1	3.45	1.45	0.77	Fixed	AVE= 0.47
	INT2	2.60	1.55	0.70*	16.92	CR= 0.73
	INT3	2.96	1.68	0.57*	15.02	Cronbach's Alpha= 0.72
Indexes tested for the model's fit: Chi-square (S-B)= 579.6397; d.f.=140; Chi/d.f.=4.140 CFI=0.961; RMSEA=0.056; BBNFI=0.949; BBNNFI=0.952						

[a]Items removed.
* Significant at p-value < 0.05

Table 2. Correlation matrix and discriminate validity

	AVE	ECON	ENV	POS	NEG	INT
Economic appraisal (ECON)	0.61	*0.78*[a]				
Environmental appraisal (ENV)	0.48	- 0.34*	*0.69*[a]			
Positive affects (POS)	0.86	0.25*	- 0.25*	*0.92*[a]		
Negative affects (NEG)	0.69	- 0.16*	0.44*	- 0.22*	*0.83*[a]	
Behavioural intention (INT)	0.47	0.23*	- 0.33*	0.34*	- 0.55*	*0.69*[a]

[a] Italics represents square root of AVE

* significant correlation at p-value < 0.05

Table 3. Comparison of the model relationships

Effects		Parameter estimates	t-Statistic
H1:	Economic appraisal → Behavioural intention	0.087*	2.085
H2:	Environmental appraisal → Behavioural intention	- 0.026	-0.538
H3a:	Economic appraisal → Positive affects	0.199*	5.584
H3b:	Economic appraisal → Negative affects	- 0.056	- 1.466
H4a:	Environmental appraisal → Negative affects	0.447*	9.996
H4b:	Environmental appraisal → Positive affects	- 0.194*	- 5.029
H5:	Positive affects → Behavioural intention	0.212*	6.221
H6:	Negative affects → Behavioural intention	- 0.490*	- 10.810
Indirect causal effects:			
	Economic appraisal → Behavioural intention	0.069*	3.385
	Environmental appraisal → Behavioural intention	- 0.260*	- 8.246
Indexes tested for the model's fit: Chi-square (S-B)= 683.3172; d.f.=142; Chi/d.f.=4.812 CFI=0.952; RMSEA=0.062; BBNFI=0.940; BBNNFI=0.942			

* Significant at $p<0.05$

R^2: Behavioural intention = 0.339; Positive affects = 0.077; Negative affects = 0.203.

Table 4. Total, direct and indirect effects for prediction of behavioural intention by cognitive appraisals (economic and environmental)

	Economic appraisal	Environmental appraisal
Total effects	0.156*	- 0.286*
Direct effects	0.087*	- 0.026
Indirect effect via affects (positive and negative)	0.069*	- 0.260*
Indirect effects as percentage of total	44.23 %	90.91 %

* Significant at $p < 0.05$

Table 5. Estimated parameter and t-test for the multiple-group model

	Structural model for close neighbourhoods		Structural model for far neighbourhoods	
Effects	Parameter estimates	t-Statistic	Parameter estimates	t-Statistic
Economic appraisal → Behavioural intention	0.059*	2.500	0.115*	3.288
Environmental appraisal → Behavioural intention	- 0.075*	- 2.759	0.022	0.512
Positive affects → Behavioural intention	0.315*	16.979	0.152*	5.111
Negative affects → Behavioural intention	- 0.567*	- 23.759	- 0.450*	-11.682
Economic appraisal → Positive affects	0.132*	5.140	0.250*	8.864
Environmental appraisal → Positive affects	- 0.257*	- 7.378	- 0.066*	- 2.205
Economic appraisal → Negative affects	- 0.058*	- 2.435	- 0.096*	- 3.210
Environmental appraisal → Negative affects	0.418*	11.924	0.433*	11.698
Indirect causal effects:				
Economic appraisal → Behavioural intention	0.075*	4.374	0.081*	5.108
Environmental appraisal → Behavioural intention	- 0.318*	- 10.601	- 0.205*	- 8.386

* Significant at $p < 0.05$

R^2 (close neighbourhoods): Behavioural intention = 0.528; Positive affects = 0.084; Negative affects = 0.178.

R^2 (far neighbourhoods) Behavioural intention = 0.256; Positive affects = 0.067; Negative affects = 0.197.

Figure 1. Structural model