Environmental Protection in Environmentally Reactive Firms:

Lessons from Corporate Argentina

Abstract

We propose a model of planned corporate environmental behaviour that emphasises the values and attitudes of managers towards the environment, environmental intentions and the context in which these intentions are formed and translated into actual performance. In particular, we focus on the extent to which environmentally reactive (as oppose to pro-active) managers influence the environmental performance of their firms. We identify the factors that mitigate or accentuate the effects of environmental "reactivism" – *i.e.* a mind-set shared by those who assign to the state the responsibility of protecting the environment. We generate a series of hypotheses and use structural equation modelling to test them in the context of a unique data-set of Argentinean firms. Our system's approach to corporate environmental behaviour explains approximatively 70% of the variation in reported environmental performance across firms while highlighting elements of the model that may potentially be influenced by policy. Amongst other things, our empirical results suggest that stakeholder pressures can be an effective tool in the development of pro-environmental attitudes (and environmental intentions in the case of small firms) and in so doing offset some of the negative effects of environmental reactivism on environmental performance. Our paper highlights a number of other important implications for the design and implementation of environmental policies that account for human managerial determinants of corporate behaviour and social factors.

Keywords: Argentina, Environmental Attitude, Environmental Behaviour, Environmental Management Systems, Environmental Reactivism, Structural Equation Modelling

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INTRODUCTION

Despite recent and renewed faith in regulatory approaches to curb environmental degradation (Karnani, 2011), evidence suggests that voluntary actions by firms may still be needed to compensate for enforcement failures (Darnall, Henriques and Sadorsky, 2009). Despite this our understanding of the environmental behaviour of firms and how they can be persuaded to engage voluntarily in corporate environmental protection is incomplete and lacks coherence (Valente, 2012).

What is needed is an account of the overall institutional process of corporate environmental behaviour, one linking core environmental beliefs and attitudes to actual performance. Doing this requires recognition that (a) organisational actors interact with internal and external stakeholders and come to share understandings of what to do and why (Halme, 2002) and (b) within an organisation, this collective creation of meaning is shaped by the core beliefs and attitudes of their members (Bartunek, Rousseau, Rudolph and DePalma, 2006).

Core beliefs about what is 'normal' reflect how the individual perceives power relationships in society, including notions of who is empowered and social/ethical frames (Foucault, 1984). In this paper, we shall argue that `policy beliefs about agency` – i.e. whose responsibility it is to protect the environment – is the most relevant dimension of core beliefs in the determination of corporate environmental behaviour (Dryzek, 1997; Simon and Sandstrom, 2011). This assumption is embodied in the introduction of `corporate environmental reactivism`, a construct that captures the extent to which a firm (i.e. its managers) believes that the responsibility to look after the environment lies with the state.

Our ultimate objective is to map out the conversion of this core belief (i.e. the extent of environmental reactivism) into corporate environmental performance, specifying as best as we can the stages in-between. Evidence suggest that core beliefs are difficult to alter so understanding these intermediate stages may help identify how, when and where policy can be most effective in influencing final outcomes (Sabatier, 1988).

Our paper consequently develops a multi-stage model of corporate environmental behaviour which is empirically tested using data collected from 536 Argentinean firms. The concept of corporate environmental behaviour is unpacked into five different core dimensions: the company's core beliefs towards the environment (Environmental Reactivism), the company's managerial locus of control, the company's attitude towards environmental activities (Environmental Attitude), activities companies do to protect the natural environment (Environmental Management Intentions) and the success of such activities (Environmental Performance). To these we add two exogenous context factors – internal obstacles and stakeholder pressures. Structural equation modelling is then used to estimate the relative strengths of the relationships between these behavioural components in the determination of corporate environmental behaviour and the impact of context variables on these relationships. We argue that such insights can help the design and implementation of environmental policies that explicitly account for the human element while recognising the social context in which they are implemented.

In this way the paper makes theoretical, empirical and policy contributions. From a theoretical perspective, the model emphasizes how insights from individual behaviour theories can be used to understand corporate environmental behaviour. In particular it underlines the role played by managers' core policy belief about agency – whose responsibility it is to protect the environment - in the determination of environmental attitudes, intentions and performance. It also depicts the behavioural mechanisms by which

stakeholder pressures and internal obstacles influence corporate environmental performance. Our empirical contribution is achieved by using this multi-stage model to test 6 hypotheses that evaluate the importance of the human element in the 'greening' of corporate behaviour using a unique data set of Argentinean firms. Given the limited number of studies on the environmental behaviour of managers in developing countries, our investigation of environmental reactivism adds to our understanding of collective forms of social responsibility and serves as a useful benchmark for international comparisons. The paper's third objective is to highlight some of the implications of the analyses for the design and implementation of environmental policies in the context of environmental reactivism.

The paper is organised into 8 sections. Section 2 develops the theoretical framework. Section 3 explains how the model is operationalized and presents the hypotheses. Sections 4, 5 and 6 follow with a description of the data and analyses. Section 7 draws out results. Conclusions and policy implications follow in Section 8.

CORPORATE ENVIRONMENTAL BEHAVIOUR

Etzioni (2007) is amongst those who argue that the existing literature on firms and the natural environment is not particularly cohesive. In particular, our understanding of why companies respond differently to the same pressures is very fragmented (Boiral, 2007; Kock, Santalo and Diestre, 2012).

Existing studies predominantly focus on the analysis of external pressures (e.g. regulatory stringency) on an organisation (Delmas and Toffel, 2008; Delgado-Ceballos, Aragon-Correa, Ortiz de Mandojan, and Rueda-Manzanares, 2012; Bansal and Gao, 2009) and less on the interactions of individuals and organisational factors in forming a corporate response to green issues. Cordano, Marshall and Silverman (2010) is a notable exception. Using the U.S. wine industry as their platform and the Theory of Planned Behaviour (Ajzen, 1991) as their theoretical framework, the authors examine managers' attitudes, norms and

perceptions of stakeholder pressures to assess their intention to implement environmental management systems (EMS). They subsequently test whether voluntarily established EMS increased the success of firms' energy conservation and recycling practices. Their study highlights the importance of employee norms in the adoption of EMSs while making recommendations about EMS components that are particularly effective in the U.S. wine industry.

Our model builds on Cordano et al (2010) and extends it in several important ways. Firstly, we formulate a model of corporate environmental behaviour where organisational constraints and institutional pressures indirectly determine environmental outcomes through their impact on the implementation of EMS. Secondly, we use structural equation modelling to investigate the mediating role of EMS in converting 'green' attitudes into improved environmental performance. Thirdly, our model uses an objective construct of environmental performance that covers a wider range of environmental impacts. Finally, our sample includes a variety of potentially polluting industries in the province of Buenos Aires (Argentina) where norms, attitudes, stakeholder pressures and markets are likely to be substantially different than those found in the US wine industry.

As in Cordano et al (2010), we use Azjen's (1991) Theory of Planned Behaviour (TPB) as a theoretical foundation and assume that pro-environmental outcomes are preceded by implementation intentions. We also adopt their suggestion that implementation intentions can be proxied by the strength of their environmental management systems (EMS). Ajzen, Czasch and Flood (2009) empirically demonstrates that correlations between stated attitudes and behaviour are often lower than theoretical expectations but that this gap can be reduced by using "implementation intentions" – *i.e.* actual plans, procedures and systems (such as EMS) specifying when, where and how the intended behaviour (i.e. full compliance with legislation) will be carried out and facilitating its implementation. For this reasons we shall

refer to EMS as environmental management intentions or (EMIs) throughout the remainder of the paper. Our model assumes that EMIs are influenced by managers' feelings of empowerment and beliefs about agency (Hines, Hungerford and Tomera, 1987; Bamberg and Moser, 2007).

We also recognise that the translation of 'intentions to behave' into 'actual behaviour' will be influenced by obstacles and pressures (Ostrom, 1999; Stern, Dietz and Guagnano, 1995). External pressures can "…(E)nhance managers' ability to voice their views allowing change to spread from pockets wider into the organisation." (Halme, 2002:10) It is also recognized that external pressures can trigger improvements in environmental performance, even if the dominant values remain non-environmental (Newton, 2002). More concretely, firms can 'cope' with pro-environmental external pressures by deploying 'symbolic performance' without implementing significant performance improvement (Boiral, 2010). Nonetheless, continued pressures and managers` perceptions of the importance of such pressures can help overcome organisational resistance and translate symbolic actions into actual performance (Etzioni, 2007; Henriques, Husted and Montiel, 2013) since managers are likely to try and form long-term coalitions with external stakeholders who they perceive as being influential (Simon and Sandstrom, 2011).

Although significantly less attention has been given in the literature to the obstacles which negatively affect corporate environmental performance (Delgado-Ceballos et al, 2012) previous research emphasises organisational constraints such as the lack of resources, skills and training of employees in matters relating to the environment (Dasgupta, Hettige and Wheeler, 2000; Banerjee, 2001; Vazquez, Liston-Heyes, Plaza-Ubeda and Burgos-Jimenez, 2010). Obstacles and pressures are included in our corporate TPB model as context factors that impact upon the translation of beliefs into actions.

OPERATIONALISING THE MODEL

This section describes the components of the theoretical model and the hypotheses tested in the analyses section. A structural representation of the theoretical framework and the proposed hypotheses are depicted in Figure 1 below.

Environmental Reactivism

Following Sabatier's (1987) and Dryzek's (1997) analysis of environmental discourses we argue that a core policy belief that is key in explaining attitudes towards environmental protection relates to notions of agency in environmental protection. For this reason, we focus on the extent to which firms adhere to 'corporate environmental reactivism' to represent their core organisational policy belief in matters of environmental protection. More concretely, environmental reactivism is a cognitive representation of bounded responsibility towards environmental protection according to which firms' only responsibility is to abide by the law. Under extreme forms of environmental reactivism, the state is recognised as the only actor empowered to devise coordinated strategies for translating environmental protection objectives into regulation - individual and organisational voluntary actions are not needed.

By placing the core policy belief of environmental reactivism at the heart of our model, we recognise that "(…) a firm's values impede, shape and filter the change efforts that individual initiate" (Bansal, 2003: 519).

Managerial Locus of Control

Even if environmental beliefs are deeply ingrained in the manager's psyche, their translation into attitudes, intentions and behaviour will be determined by his or her locus of control – i.e. what the individual sees as being within or beyond his/her control given context specific constraints (Stern et al, 1995; Bamberg and Moser, 2007). There is a difference in strategy-making behaviour between managers who exhibit an internal locus of control - they think that their own behaviour 'makes' a difference - versus that of managers with an

external locus of control who see change as somewhat random and/or provoked by more influential people (Hines et al, 1987). The former tend to promote innovative, pro-active and riskier corporate strategies while the latter will tend to follow strategies within the constraints of rigid external boundaries "that cannot be violated" (Miller, Kets de Vries and Toulouse, 1982:251).

Environmental Performance Attitudes

Attitudes are judgements about the importance of a particular issue and about the selection of a behaviour that fits with a given situation. Beliefs are converted into attitudes before they are translated into intentions and actual behaviours (Martin and Simint iras, 1995). Research examining the factors related to green behaviour suggests that an individual's ecological attitude is highly dependent upon his/her knowledge of the relevant environmental issues (Bamberg and Moser, 2007). This study focusses on attitudes towards environmental practices relating to 'action-based knowledge' at the corporate level. Unlike general knowledge which relates to managers' rudimentary understanding of environmental issues including basic terminology and concepts, action-based knowledge relates to managers' understanding of the activities required to mitigate environmental problems. It includes an awareness of the consequences of individuals' actions on the environment and of the remedies that can improve behaviour (Hines et al., 1987). Individuals with stronger action-based knowledge about a particular set of practices are more likely to have a positive attitude towards the importance of these practices to environmental protection (Bamberg and Moser. 2007)

Environmental Management Intentions (EMIs) and Environmental Performance

Attitudes influence specific intentions to implement (or not) a behaviour (Cordano et al, 2004). Despite conventional wisdom, correlations between stated/reported intentions and actual behaviour are not as strong as theory suggests in the context of self-regulation

(Bamberg and Moser, 2007). However, these become much stronger if we consider the link between implemented intentions - *i.e.* intentions that are materialised into specific plans and strategies to carry a specific behaviour (Ajzen et al, 2009).

Ajzen et al's (2009) implementation intentions construct includes factors that are actual actions such as 'developing a detailed plan', 'designing strategies' and 'setting mechanisms and systems to support the intended behaviour'. Implementation intentions are assumed to reflect responsiveness. They produce commitment but also "automaticity in behavior by means of a single mental pairing of a goal-directed behavior with critical stimulus cues" (Ajzen et al, 2009:181). In our model, corporate environmental management intentions (EMIs) are measured by the extent and degree of formalization of internal administrative systems to encourage and support improvements in environmental performance. Consequently, our conceptualization of EMIs refer to all firm activities that enable it to detect and react to green pressures including administrative support, planning, coordination, training and management efforts to identify and implement practices to improve environmental performance as well as the communication of such efforts to stakeholders (Henriques and Sadorsky, 1996; Cordano et al, 2004) - i.e. EMIs are inclusive of formal EMSs.

We follow Klassen and McLaughin (1996) and Cordano et al (2010) in *not* assuming that EMIs can be used to proxy environmental performance. Instead, the environmental performance of the firm is measured by a multidimensional measure of the success of its environmental actions (Klassen and McLaughin, 1996; Henriques et al, 2013). Thus, the 'environmental performance' construct includes the success of both reactive (legislation, compliance, treatment plants) and proactive (R&D, green products, waste minimization, recycling/reusing, remanufacturing, energy reduction, continuous improvement) actions

identified in the technical environmental literature as conducive to direct reductions in environmental externalities.

Context Factors: Internal Obstacles and Stakeholder Pressures

Following Ostrom (1999), the model recognises that the translation of beliefs into intentions to behave will be influenced by obstacles and drivers of environmental performance. Pressures to be 'green' have been the subject of a plethora of studies including those by Delmas and Toffel (2008) and Sharma and Henriques (2005). Managers tend to categorise such pressures into opportunities to achieve gains, threats and/or requirements. Our model recognises this by adding a number of institutional, organisational and market motivators to our list of context factors including opportunities to improve competitiveness (Sharma and Henriques, 2005), social legitimacy (Kennedy and Fiss, 2010), mimicry (Bansal, 2005), threats from formal (Angell and Rands, 2003) and informal regulation (Dasgupta et al, 2000), supply chain requirements (Henriques and Sadorsky, 1996), and internal organisational stakeholder requirements (Balogun and Johnson, 2005).

Significantly less attention has been given to the obstacles or inhibitors that negatively affect the development of a proactive environmental strategy (Delgado-Ceballos et al, 2012). Internal obstacles to environmental efforts typically span three categories: i) lack of environmental training and skills (Dasgupta et al, 2000; Banerjee, 2001); ii) lack of economic resources and iii) low priority assigned to environmental issues (Vazquez et al, 2010).[1] In this study, the choice of obstacles is inspired by work conducted by Dasgupta et al (2000) in Mexico on behalf of the World Bank.

The items used to measure these seven concepts are discussed further below.

Hypotheses

From the previous discussion, we derive six testable hypotheses and sub-hypotheses that underpin the statistical analyses that follow.

A high value attached to the environmental reactivism scale reflects managers' beliefs that the scope of their firms' environmental responsibility is defined by the regulator. In other words, a high score means that managers are aware of environmental challenges but they give environmental issues priority only if required to so do by regulators. If enforcement is low they will comply with environmental regulation only if it does not clash with shareholder's interests. A lower score is associated with firms that are more pro-active and willing to act independently beyond regulatory strictures.

High levels of environmental reactivism are typical of 'defensive firms' in the phase of adjustment to environmental pressures. Managers with this type of mind-set will avoid acknowledgment of responsibility at corporate level believing that companies are powerless to improve the environment on their own (Dryzek, 1997). For this reason, we postulate that their locus of control will be perceived as 'external' to the organisation. An external locus of control in the environmental context implies a reluctance to accept that individuals play a role in causing environmental deterioration and should be involved in actions to mitigate it (Lorenzoni, Nicholson-Cole and Whitmarsh, 2007). We also hypothesise that managers, while acknowledging environmental challenges, will downplay their urgency and centrality and assign higher priorities to economic and developmental concerns (Dryzek, 1997). A strongly reactivist environmental mindset will also limit investments in environmental action-based knowledge acquisition and lead to unambitious goal setting with respect to the environment – i.e. a relatively weak environmental attitude (Crane, 2000). Although regulatory compliance will be considered important, voluntary actions will be assigned low organisational priority and their implementation will be strongly influenced by financial considerations (Kock et al, 2012). In other words, we expect that the extent of environmental reactivism at the firm will be positively related to an external corporate managerial locus of control and inversely related to the environmental attitude construct.

H1a: Corporate environmental reactivism will be positively related to an external managerial locus of control.

H1b: Corporate environmental reactivism will be negatively related to a strong corporate environmental attitude.

The managerial locus of control determines the extent to which managers of a firm feel empowered to make a difference to the environment. Leadership research suggests that internally-oriented managers are more confident in their ability to impact the environment, more skilled in dealing with stressful situations, place more emphasis on open and supportive means of influence, engage in riskier and more innovative company strategies and generate higher group and company performance than do managers with externally-oriented managerial loci of control (Miller, Kets de Vries and Toulose, 1982; Waldman, Siegel and Javidan, 2006).

Research on organisations and the natural environment suggests that an internal locus of control is a strong determinant of environmental strategy and intended pro-environmental behaviour (Williams and Schaefer, 2013). Individuals who have an internal environmental locus of control (stronger sense of empowerment towards environmental concerns) are more likely to act in a way that mitigates these concerns and are less afraid of taking risks for the 'right' reasons (Hines et al, 1987; Stern et al, 1995; Bamberg and Moser, 2007). Thus, firms led by managers with an internal locus of control tend to be relatively more environmentally responsive (Vazquez-Brust and Liston-Heyes, 2010). In contrast, firms with an external locus of control will use neutralization strategies – e.g. "my firm is too small to make an impact", "my firm will not be competitive" – to justify inadequate action (Hillary, 2000). We repeat and extend these predictions by assuming that a more internally focussed locus of control plays an important part in developing environmental management intentions and mobilising firms into action.

H2a: *More internally-focussed locus of control will be positively related to stronger environmental attitudes.*

H2b: *More internally-focussed locus of control will be positively related to stronger environmental management intentions.*

For similar reasons, the attitude of managers towards what is socially acceptable in terms of the corporate-environment relationship will frame discussions of organisational change and 'normal' practices (Balogun and Johnson, 2005). This will impact upon how firms set their performance goals and hence on actual environmental behaviour (Bamberg and Moser, 2007; Balogun and Johnson, 2005). Attitudes underpinned by action-based knowledge affect motivation, strategy and ability to act in an environmentally friendly way. The more knowledge, the stronger the commitment to implement the behaviour will be (Bamberg and Moser, 2007).

Insights from behavioural theories also suggest that environmental intentions mediate the relationship between environmental attitude and environmental performance particularly when performance is self-regulated (Ajzen et al, 2009; Bamberg and Moser, 2007). Corporate practices signalling 'environmental intentions' such as environmental managements systems, training or implementation strategies facilitate the translation of action-based knowledge and attitudes into outcomes and bring about environmental performance (Johnstone and Labonne, 2009).

Accordingly, we postulate that a strong environmental attitude will impact directly on EMIs (H3a) and environmental performance (H3b) (Dryzek, 1997; Hajer, 1995). We also hypothesise that EMIs mediate the relationship between action-based knowledge and environmental performance (H3c).

H3a: *The strength of the environmental attitude will be positively related to environmental management intentions (EMIs).*

H3b: *The strength of the environmental attitude will be positively related to corporate environmental performance.*

H3c: *Environmental management intentions mediate the relationship between the strength of environmental attitude and corporate environmental performance.*

Developing 'implementation intentions' - plans, procedures and systems - creates commitments to perform a given behaviour (Ajzen et al, 2009). At the firm, EMIs inform managers about its liabilities, provide guidance on how to achieve a good performance and institutionalise environmental performance as a corporate objective (Potosky and Pradash, 2005). They also act as a facilitator in the implementation of pro-environmental practices by helping to resolve internal agency control issues which can result in adverse environmental impacts. Surprisingly however, the empirical evidence on EMIs efficiency is mixed (Anton, Deltas and Khanna, 2003; Henriques et al, 2013). Some authors found that the adoption of environmental management systems (our proxy for EMIs) lead to significant improvements in environmental performance (e.g. Dasgupta et al, 2000; Potosky and Pradash, 2005) while others found no such evidence (King and Lennox, 2000; Boiral, 2007).

Boiral (2007) argues that in many cases environmental management systems do not improve performance because they are only aimed to be symbolic actions for external stakeholders. Managers are aware that failing to signal pro-environmental responsiveness can result in a loss of social legitimacy (Johnstone and Labonne, 2009). To overcome conflicts in the allocations of resources while minimising damage to social legitimacy, managers will favour symbolic actions (*e.g.* codes of conduct) without necessarily applying them in practice (Fiss and Zajac, 2006). Symbolic actions are less costly than actual

behaviour but are effective in managing public perceptions of legitimacy and social acceptance.

Anton, Deltas and Khanna (2003) suggest that it is the comprehensiveness of the EMS (depth and range of issues addressed) that explains differences in performance. In their study, firms with more comprehensive EMS have lower toxic emissions per unit output. Likewise, Johnstone and Labonne (2009) found that certified EMS are in general more comprehensive than non-certified ones and that firms with more comprehensive EMS are more likely to have a variety of other environmental management tools in place (see also Henriques et al, 2013).

In line with these findings, the EMIs index used here assigns higher scores to firms with more formalised and comprehensive environmental management systems. We hypothesise that firms with a higher EMI index will show improved environmental performance (H4).

H4: *Stronger environmental management intentions are positively related to corporate environmental performance.*

Change is incremental in most organisations. Environmentally reactive managers often begin the process of responding to "greening" pressures by modifying current practices 'as needed' (Post and Altman, 1994). Path dependency and organisational inertia create biases against environmental goal setting, the development of EMIs and the carrying out concrete environmental actions when organisations have to make decisions about the distribution of scarce resources (Sydow, Schreyogg and Koch, 2009). Without strong environmental values in the organisation, middle managers will tend to be averse to environmental improvements and unable to surmount corporate inertia and other internal obstacles (Kock et al, 2012). Following Post and Altman (1994), we hypothesise that internal obstacles will weaken environmental attitudes, EMIs and corporate environmental

performance thereby creating the performance gaps frequently observed in the execution of environmental change programmes.

H5a: *Internal obstacles are negatively related to the environmental attitude construct.*

H5b*: Internal obstacles are negatively related to environmental management intentions.*

H5c: *Internal obstacles are negatively related to corporate environmental performance.*

Organisational change in firms with environmentally reactive CEOs will tend to follow a mostly reactive and incremental pattern, driven by regulatory and market pressures (Post and Altman, 1994). These firms are typically able to identify pro-environmental pressures that need to be addressed to ensure the organisation's survival (Delmas and Toffel, 2008). In this way stakeholder pressures are effective in mobilising environmentally reactive firms into actions.

Neo-institutional theorists argue that organisational structures and processes seemingly implemented for compliance purposes are often created only to buffer the organisation from stakeholder pressures (Etzioni, 2007). As discussed, responses to pressures may be decoupled from the actual environmental impacts of the firm if they respond with mostly 'symbolic actions' (green-washing). Nonetheless, over-reliance on symbolic actions has limited long term appeal as stakeholders learn to decipher real from stated actions (Johnston and Labonne, 2009). Moreover, competitive pressures add impetus to behaviour change (Bansal, 2005).

We therefore postulate that increases in environmental pressures will be matched by stronger environmental attitudes (H6a), enhanced intended behaviour (H6b) and improved corporate environmental performance (H6c).

H6a: *Stakeholder pressures are positively related to the environmental attitude construct.*

H6b*: Stakeholder pressures are positively related to environmental management intentions.*

H6c: *Stakeholder pressures are positively related to corporate environmental performance.*

We control for the effects of firm size on these relationships (H1-H6). Firm size is a common control variable in empirical studies as it captures competitive benefits associated with average costs and greater bargaining power. The traditional argument for including size in studies of environmental regulation is that there are likely to be economies of scale in both the productive and administrative aspects of compliance with environmental requirements (Heyes, 2009). In other words, bigger firms may find compliance and environmental performance 'cheaper' than smaller firms and be relatively more pro-active in terms of staying ahead of the enforcement game. Big firms also tend to be the prime target of militant stakeholders and green activists and are hence more likely to be scrutinised than their smaller counterparts (Baron, 2001). Our model and these hypotheses are summarised in Figure 1.

INSERT FIGURE 1 ABOUT HERE

DATA

The first phase of the project entailed an exploratory study of 50 Argentinean firms using corporate reports, audits and semi-structured interviews with environmental actors. Discourse analysis was used to uncover key 'story-lines' (short narratives) and in the identification of dominant corporate paradigms (Vazquez and Liston-Heyes, 2008). Phase I was instrumental in the development of the theoretical framework, the 'environmental reactivism' construct and in operationalizing the data collection.

Phase II, the subject of this article, focuses on testing the theoretical model. For this purpose we designed a large scale survey following the methodological guidelines used by previous research in organisational narratives (Phillips, Lawrence and Hardy, 2004; Bartunek et al, 2006) and environmental paradigms (Cotgrove, 1982). Together, these

authors argue that discourse analysis provides a useful theoretical framework for exploring the social construction of institutions. In particular, they propose a set of conditions and features of discourse that lead to the production of institutional processes. Their pioneer work encourages the empirical examination of language and storylines in organisational research. We used these insights in the conceptualisation and design of the survey instruments and in the collection of the data. The time line of this research is represented in Figure 2.

INSERT FIGURE 2 ABOUT HERE

The survey was used to gather information on the relationship between environmental beliefs and environmental behaviour by incorporating popular environmental 'storylines' generated by desk-research and discourse analysis (Phase I). It also identified the characteristics of the 'context' in which the firm and its managers operate. The survey's third objective was to compare the environmental beliefs and attitudes of the individual managers in charge of environmental affairs with those displayed by the firm in its corporate reports and other public documents.

DATA

The Phase II survey was executed in Buenos Aires between March 2006 and March 2007. The sample included 536 firms - 13% of the population of polluting industries in the provincial industry census - which operate in sectors that use processes that may involve the discharge of polluting substances and wastes in water, air or soil, and/or use a lot of energy, water and non-renewable resources. These include metallurgy, food and drinks, chemicals and petrochemicals, pharmaceuticals, non-basic metals, manufacturing, hospitals, treatment plants and petrol stations.

The sample was selected using a stratified design technique with industry, size, and geographical location as selection parameters.[2] Approximately 60% of the firms had less than 100 employees (the number of employees ranged between 1 and 4190 with an average of 97 per firm). The Ministry of Public Works and the Inter-American Development Bank (IDB) in Argentina supported the delivery and administration of the survey. Linkages to these two institutions facilitated access and enhanced participation from managers. The municipalities provided access to restricted databases as well as fees and stipends for the surveyors operating in their jurisdictions. Focus groups, pilot testing and training sessions with surveyors were held to explain and fine-tune the survey instrument. Monitoring of selected interviews was organised and a general debriefing/workshop took place to assess the quality of the responses once the first 30 questionnaires were completed.

The survey is composed of two structured questionnaires and a financial annexe. The first questionnaire ("Environmental Practices"- 60 minutes) was delivered and completed by the manager in charge of environmental affairs within each organisation. The second ("Managers' opinions" - 20 minutes) is shorter and completed by senior managers empowered to take strategic decisions on environmental issues at company level. The final response rate was 76%.

Since many of the 98 survey items use a Likert scale (i.e. respondents were asked to indicate their agreement with each of a series of statements by indicating a response on a scale from 1 to 5) the actual number of questions is well over 300. These can be grouped into 9 broad categories: i) about the firm, ii) corporate perceptions of existing and planned environmental regulations, iii) corporate self-assessment of environmental performance, iv) perceived constraints on environmental performance, v) corporate environmental practices and behaviour, vi) corporate reasons for compliance and environmental pressures; vii) the firm's human component; viii) respondent's profile and ix) a financial annexe. More details

of these categories are presented in Vazquez (2007). An original Spanish or English translation of the questionnaire is available from the authors upon request.

ANALYSIS

Structural equation modelling (AMOS 20) is used to test empirically the hypotheses and theoretical model presented above.

We use a strictly confirmatory approach whereby the model is tested using goodness-of-fit tests to determine if the pattern of variances and covariances in the data is consistent with a structural model specified by the researcher (Figure 1). The reader should bear this is mind when interpreting the results that there may be other unexamined models consistent the data, such that an accepted model is only a 'not-disconfirmed' model.

In accordance with general tradition, latent variables are depicted as ellipses and manifest variables as rectangles. Figure 1 represents the hypothesized causal structure as a path diagram with variables shown as ellipses and rectangles and possible causal links shown as arrows. The parameter estimates were calculated using the maximum likelihood method. Missing data was handled using list-wise deletion (the default in AMOS) thereby reducing the sample size from n=535 to n=505 (i.e. a reduction of usable data points of 5.6%). A comparison of the discarded data with overall averages does not indicate significant differences in the pattern of responses.

We first tested a measurement model (Model 1) that includes one observable variable, 6 latent variables and 54 items. The latent variables include ENVREACT (environmental reactivism – 5 items), LOC (managerial locus of control - 4 items), ENVATT (environmental attitude - 9 items), OBS (internal obstacles - 13 items), PRESS (stakeholder pressures – 12 items) and ENVPERF (corporate environmental performance – 11 items). All the latent variables have factor loadings higher than the .40 level and above, a rule of thumb routinely used in the social sciences (Ford, MacCallum and Tait, 1986) and

display Cronbach Alphas (a popular measure of scale reliability) above .70. The observed variable "environmental management intentions" (or EMI) is a weighted average of 11 dichotomous indicators of the extensiveness of the firm's environmental management system (Chudnovsky, Pupato and Gutman, 2005). EMI scores indicate the completeness and level of formalisation of the firm's environmental management system.

Prior to testing our structural equation model (SEM), we created parcels for the latent variables that had over 5 items. Parcels in SEM help to maintain a manageable indicator-to-sample size ratio (e.g. Bagozzi and Edwards, 1998; Bagozzi and Heatherton, 1994), provide an adequate representation of latent constructs (Hagtvet and Nasser, 2004), have higher reliabilities than single items and offer a better approximation of normal distribution on continuous variables (Kishton and Widaman, 1994). Accordingly in Model 2 we create parcels using the 'item-to-construct balance' approach described in Little, Cunningham, Shahar and Widaman (2002).[3] More concretely, we created 3 parcels across 9 items to measure environmental attitudes (ENVATT), 3 parcels across 13 items to measure internal obstacles (OBS), 3 parcels across 12 items to measure stakeholder pressures (PRESS) and 3 parcels across 11 items to measure environmental performance (ENVPERF). We left the ENVREACT and LOC constructs untouched since they have fewer items.

In Model 3, we preserve the same structure but parcel the items associated with PRESS and ENVPERF differently. The exploratory factor analyses suggest that these two variables have relatively weaker unidimensional structures than the other latent variables. Consequently, we test a model where the parcels for these two variables reflect these secondary influences – i.e. parcels are internally consistent facets that are used as manifest indicators of the higher order construct (Little et al, 2002:167; see also Kishton and Widaman, 1994). Tables I-VII describe the items in each construct. The mean and standard deviation are shown for each item along with factor loadings and parcel membership in

Models 2 and 3. The studies underpinning the constructs (see also Section 3) are listed in the last row of each table. Table VIII provides construct reliability coefficients and correlations between the variables of the model.

While the measurement model (Model 1) performed satisfactorily in the confirmatory factor analysis, its overall fit is substantially improved by the introduction of parcelling. (Goodness-of-fit indicators with recommended thresholds appear in the first 4 columns of Table IX.) Since Models 2 and 3 performed well, we used both in our analyses of the structural model presented in Figure 1 – i.e. Structural Model 2 uses an item-to-construct balance approach to parcelling while Structural Model 3a uses higher order constructs for PRESS and ENVPERF.

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INSERT TABLE VII ABOUT HERE

INSERT TABLE VIII ABOUT HERE

RESULTS

Goodness-of-fit indicators for Structural Models 2 and 3a appear in Table IX and are all within the satisfactory range. This is reassuring given that the choice of parcelling technique can impact the performance of SEM if unmodeled secondary factors are present (Hall, Snell and Foust, 1999). A detailed examination of the outputs does not indicate major differences in the sign and/or statistical significance of the parameter estimates between Models 2 and 3a. For readability purposes, we only present estimates of Model 3a (which keeps the multidimensional nature of the PRESS and ENVPERF constructs explicit) in Figure 1 and Table IX since it performed marginally better than Model 2.[4]

As for the effects of firm size, we control for them in two ways. First, we introduce 'SIZE' as an exogenous control variable in the structural model and test its impact on the endogenous variables. Secondly, we separate the data into two sets - small firms (i.e. firms with less than 100 employees) and large firms (i.e. firms with 100 employees or more) – and test these models for configural invariance to verify that they share the same structure and to identify differences in regression estimates. While Model 3b (small firms) performed well statistically, some of the goodness-of-fit indicators for Model 3c (large firms) are somewhat weaker (i.e. the Hoelter Indices are below the 200 threshold and the RMSEA is within the acceptable as oppose to the "very good" range). Overall however the model's fit indicators are within satisfactory limits lending credence to its estimates.

INSERT TABLE IX ABOUT HERE

The final structural models 3a, 3b and 3c explained 68%, 61% and 86% of the variance in the Environmental Performance variable. Table X presents standardised regression coefficients, standard errors and probability levels. The last column indicates

whether there are qualitative differences between the coefficients of small versus large firms. Figure 3 presents the final structural model (Model 3a) with statistically significant standardised path estimates.

DISCUSSION

All but two of hypotheses (H5a and H6c in Figure 1) are supported by the analyses although H1b only holds for large firms and H6b only holds for small firms. We shall discuss the results using all the firms in the first instance and add specific comments on the effects of size when relevant.

INSERT TABLE X ABOUT HERE

INSERT FIGURE 3 ABOUT HERE

Consistent with H1a, the extent of environmental reactivism of senior managers is a significant and positive predictor of an external managerial locus of control (β_{all}=0.40; β_{small}=0.44; β_{large}=0.45; p<.01) for firms of all sizes. Environmental reactivism is also linked to weaker environmental attitudes (H1b) although this was only true for larger firms (β_{large}=-0.17; p<.01). In other words, "reactive" managers tend to feel powerless in solving wider environmental problems, a role they delegate to the state. These results suggest that environmental reactivism weakens environmental attitudes in significant ways for large firms and is strongly associated with a more externally focused managerial locus of control in all firms.

We also test the hypotheses that a more internally focussed managerial locus of control leads to stronger environmental attitudes (H2a) and management intentions (H2b). These two hypotheses are supported by the data and hold for all firms (H2a: β_{all}=-.21; β_{small}=-.23; β_{large}=-0.17 and H2b: β_{all}=-.18; β_{small}=-.22; β_{large}=-0.18; all with p<.01). We can

conclude tentatively that an external managerial locus of control – *i.e.* when the firm feels powerless to prevent environmental degradation – is linked to weaker environmental goals and environmental intentions. Taken together, environmental reactivism appears to have profound negative effects on corporate environmental attitudes and environmental management intentions.

Next we investigate the relationships between environmental attitudes and management intentions (H3a) as well as corporate environmental performance (H3b). As postulated, the setting of higher environmental goals leads to more ambitious environmental intentions (β_{all}=0.32; β_{small}=0.38; β_{large}=0.44; p<.01) – while this is true for all firms, it is worth noting that the coefficient for large firms is significantly greater. Stronger environmental attitudes also appear to be conducive to an enhanced overall environmental performance by firms (β_{all}=0.54; β_{small}=0.59; β_{large}=0.60; p<.01). In turn, H4 tests the extent to which environmental management intentions are a strong predictor of environmental performance. As expected, the coefficient is relatively high, positive and statistically significant for all size firms (β_{all}=0.60; β_{small}=0.57; β_{large}=0.57; p<.01). In effect, having a stronger environmental attitude has a direct effect on environmental performance and an indirect effect through an intensification of environmental intentions (H3c). In other words, EMIs mediate the environmental attitude – corporate environmental performance relationship as hypothesised. The introduction of EMIs partially mediates this link and enhances the level of explained variance in the ENVPERF variable from .47 to .68. Without EMIs the parameter estimates between ENVATT and ENVPERF is β_{all}=0.60, p<.01. It is interesting to note that environmental attitudes remain very important in the determination of environmental performance even when environmental management intentions are accounted for. These findings highlight the importance of the human element in the greening of corporate behaviour.

Next are the hypotheses pertaining to the context variables that are external to the model (*i.e.* they are not endogenously determined). The first construct - internal obstacles - captures resource scarcities that can potentially impede the firm in the setting of strong pro-environmental attitudes (H5a), in the development of management intentions (H5b) and in the realisation of a strong corporate environmental performance (H5c). We found the coefficients on the two last variables to be negative and statistically significant (H5b: β_{all}=-.16; β_{small}=-.09; β_{large}=-0.20; H5c: β_{all}=-.19; β_{small}=-.21; β_{large}=-0.17; all with $p<.01$) as hypothesised. However, for small firms there is a *positive* relationship between internal obstacles and the environmental attitude construct – *i.e.* the higher the perceptions of internal obstacles, the stronger the environmental attitude (β_{small}=0.15, $p<.01$) which is somewhat puzzling. One plausible explanation for this finding is that rhetoric and goal setting is used to overcome strong organisational barriers. Managers often use discursive and other symbolic materials to overcome resistance by destroying existing meaning systems and establishing new ones in an attempt to give strategic direction (Sonensheim, 2010). Individuals must be convinced through 'organisational rhetoric' that changes in practices are required to survive and thrive. Drawing on Magee and Galinsky's (2008) conceptualization of status and power, we could argue that organisations wanting to overcome internal barriers need an environmental attitude and a discourse that emphasises the importance of environmental practices to the success of the organisation. In other words, high internal obstacles require ambitious environmental attitudes.

A second explanation draws on our earlier discussion of symbolic performance and discourse coalitions. As organisational obstacles increase, managers will try to satisfy pressures from external stakeholders with rhetoric and attitudes supporting green-storylines (Hajer, 1995). In simpler terms, the higher the perceptions of internal obstacles, the more managers invest in (less expensive) symbolic and discursive legitimating strategies such as

public relations and the communications of strong environmental attitude and goals (H5a) at the expense of investment in more cost-intensive management systems (H5b) and actual behaviour (H5c) (Boiral, 2007). Since internal obstacles *reduce* environmental intentions, it is not clear what overall effects they exert on environmental performance for small firms. They are unambiguously damaging for larger firms.

The construct measuring pressures effectively refers to stakeholder claims made to the firm in relation to the environment. These can come in the form of regulation, consumer demand for green products, supply chain requirements, community pressures and/or internal stakeholder requirements. As hypothesised, stakeholder pressures play an important and significant role in the setting of stronger environmental attitudes (H6a: β_{all}=.44; β_{small}=.43; β_{large}=.48; p<.01). In smaller firms, pressures also encourage the implementation of more sophisticated environmental management systems (H6b; β_{small}=0.15; p<.01) although this doesn't seem to be the case for larger firms. Pressures do not appear to be strong direct predictors of corporate environmental performance and we need to reject H6c. More concretely, stakeholder pressures impact positively on environmental performance but only in an indirect fashion through the enhancement of environmental attitudes (as well as stronger environmental intentions in the case of smaller firms).

Taken together the estimates relating to context variables confirm that internal obstacles reduce environmental performance directly and indirectly through its impact on intentions. Pressures on the other hand only operate indirectly as they are channelled through environmental attitudes (all firms) and intentions (for small firms only). Unlike obstacles, they do not have a direct effect on how intentions are translated into actual environmental performance.

As explained, we also tested for the effects of firm size on endogenous variables by adding a control variable. Firm size does not impact significantly on environmental attitudes

or on overall environmental performance. However, the estimates suggest that larger firms have more extensive environmental management intentions (β=0.14; $p<.01$) and a more internally-focussed managerial locus of control (β=-.16; $p<.01$). Other things equal, larger firms will have more extensive environmental management systems and feel more empowered in terms of their ability to act upon the environment. These results are not surprising if we recognise that compliance is typically cheaper for bigger firms (Heyes, 2009). It may also be the case that managers of large firms perceive themselves as more 'empowered' since their firms will usually be more politically and economically powerful than their smaller firms. Note that while size enhances environmental performance indirectly through more internally focussed managerial locus of control and stronger EMIs, it doesn't directly impact on how intentions translate into performance. In this way, pressures exert a relatively 'narrower' influence on the behaviour of large firms.

Overall then, the model performed as hypothesised except for the anticipated direct effects of stakeholder pressures on environmental performance (H6c) and for the positive impact of obstacles on the environmental attitudes of small firms (H5a).

CONCLUSIONS

This paper presents a theoretical model of corporate environmental behaviour that is informed by research on behavioural psychology as well as insights from the literature on organisations and the natural environment. This model maps out the processes by which environmental reactivism - i.e. the extent to which firms accept state regulation but resist calls for voluntary engagement with green initiatives – impact upon managerial environmental attitudes and ultimately on corporate environmental performance.

The paper makes theoretical, empirical and policy contributions. From a theoretical perspective, our model emphasizes how insights from individual behaviour theories (i.e.

TPB) can be used to understand corporate environmental behaviour. In particular it underlines the role of managers' core policy belief about agency – environmental reactivism – in the determination of corporate environmental behaviour. It also uncovers the behavioural mechanisms by which stakeholder pressures and internal obstacles influence corporate environmental performance. Finally, while most models assume that attitudes only indirectly affect performance through their impact on intentions - our model allows attitudes to impact directly on intentions *and* performance. In other words, environmental attitudes are given a potentially greater role to play in the determination of corporate environmental performance.

Our empirical contribution is realised by testing this multi-stage model on a unique data set of Argentinean firms and finding support for most (but not all) of our hypotheses. Without repeating our empirical findings, taken together we can assert that they highlight the importance of the human element in the greening of corporate behaviour while documenting the beliefs, attitudes and practices of Argentinian managers. Given the paucity of studies on the environmental behaviour of managers in developing countries, our investigation of environmental reactivism adds to our understanding of collective forms of social responsibility and serves as a useful benchmark for international comparisons.

Our third objective, which we turn to now, is to underline some of the implications of our findings for the design and implementation of environmental policies in the context of environmental reactivism. According to Karnani (2011) command and control narratives are making a comeback, at least with regards to managing the environment. However, while stricter regulations may well be effective in mobilising 'environmentally reactive' firms, they are unlikely to materialise and/or be implemented in settings where governments are resources-constrained and/or lack political motivation to do so as is often the case in Argentina and other developing countries. Our study effectively shows how such firms,

characterised as ‘morally hollow while ethically pragmatic’ by Crane’s (2000), can be coerced into taking voluntary actions.

Overall our results lend empirical credibility to a model that we argue has sound theoretical grounding, To begin, they suggest that environmental reactivism is associated with an externally focussed managerial locus of control that over-relies on the powers of economic growth and regulations to remedy environmental degradation and weak environmental attitudes. In turn, an externally oriented locus of control and weak environmental attitudes lead to poor investment in environmental management systems (intentions) and a weak overall environmental performance. While these may be gloomy results, we also demonstrate that environmental attitudes can be positively swayed by stakeholder pressures. Since pro-environmental attitudes act directly and indirectly (through environmental intentions in the case of small firms) on corporate performance, stakeholder pressures can be an interesting counterweight to environmental reactivism. Consequently, programs that help groups of stakeholders channel and communicate their demands more effectively can encourage the setting of higher performance goals and facilitate the conversion of these goals into more environmentally sustainable behaviours. This is welcome news given that beliefs about agency (environmental reactivism) are very difficult and time consuming to manipulate (Dryzek, 1997).

Moreover, regulatory actions need not mandate punitive measures and expensive enforcement programmes to be influential. In some contexts the setting of regulatory requirements and guidelines can enhance the prioritisation of stakeholder claims and trigger better communication and sharing of practices within the firm, fostering more mutual technical assistance and improving information flow between customers and suppliers leading to significant improvements in performance (Kassinis and Vafeas, 2006). Non-punitive regulatory guidelines are generally less costly (both financially and politically) and

hence more appealing to governments in developing countries. In other words, Argentina may not be ready for a system that relies in a major way on voluntary actions by firms nor can it rely on regulatory enforcement of punitive fines. However, it may be receptive to more coercive forms of stakeholder pressures that are supported by regulations but rooted in small-scale practical reasoning at the local level (Scruton, 2012).

The paper also documents the empirical importance of internal obstacles - the other context variable - in the determination of corporate environmental performance. Here too it is easy to think of a number of policies that could target the reduction in the perceptions of and/or actual organisational obstacles. While political stability and increased transparency may be longer term goals, training and awareness programmes that enhance knowledge and management skills in environmental matters can substantially decrease real or perceived internal obstacles at relatively low costs (Dasgupta et al. 2000).

In other words, our results demonstrate the potential influence pressures and internal obstacles can have on environmental attitudes and intentions. Since these variables can be manipulated in the short to medium term, the improvement of environmental performance becomes a feasible project even in the absence of strong regulators and in the presence of environmental reactive firms.

While our results lend empirical credibility to a model that we argue has sound theoretical grounding, as with any empirical study there are important caveats. First, like many studies investigating corporate behaviour the study relies on variables that are based on self-reports by key respondents (senior corporate managers). While these respondents are likely to be in the best position to answer questions about their firm's environmental policies and behaviour we cannot rule out errors and biased answers. In particular, the model could be extended to include reliable measures of financial performance as controls. Such data is difficult to obtain in a developing country like Argentina but it would substantially enrich

the model. Secondly the empirical study presented has been conducted in one cultural setting (Argentina) and a limited set of industry contexts (polluting sectors). This might limit the generalizability of the results. Replication of the study in other locations could help further validate the model while highlighting the possible effects of culture and other socio-economic differences. Our study could serve as a useful benchmark for comparative behavioural analyses. Thirdly, although the arrows in the structural model suggest causality our empirical investigations are ultimately based on covariances and correlations between variables. In particular, our analyses do not allow us to assert that a strong corporate environmental performance is necessarily caused by strong environmental attitudes nor that external management loci are caused by environmental reactivism. In our defence, the sequences of relationships in our model – values, attitudes, intentions, behaviour (performance) – are well established and theoretically sound (Ajzen et al, 2009). Yet from a policy perspective, establishing causality is important particularly with respect to the context variables which we argue can be manipulated to offset (to some extent) the impact of environmental reactivism. As our understanding of the human element of corporate environmental behaviour develops, randomised trials and natural experiments will need to be set up to uncover and confirm causal effects.

ENDNOTES

[1] Note that previous research has identified both *external* and *internal* barriers (*e.g.* Post & Altman, 1994) although empirical studies suggest the latter are more powerful (Ruiz-Tagle, 2003). We empirically tested the relevance of external barriers in our model but found they were not statistically significant. They were removed from the final version on grounds of parsimony.

[2] All firms were first stratified under the SIC Revision 3 classification and subsequently by plant size as measured by number of employees. Within these strata, firms were ranked by their level of environmental impact as measured by the NCA or 'Level of Environmental Complexity' which ranges between 20 and 80. This index is computed by a formula that uses a number of environmental impact parameters such as volume of effluents, concentration of polluting substances, type of environmental impact as well as features of the area surrounding the plant. The Environmental Agency uses NCA to classify firms according to whether they are Type I (low impact), Type II (medium impact), Type III (high impact), or no impact in accordance with Law 11.459. See Vazquez Brust (2007) for details of the sampling method.

[3] For each construct, the three items with the highest factor loadings are used to anchor three parcels. The three items with the next highest item-to-construct loadings were added to the anchors in an inverted order. The highest loaded item from the anchor items are then matched with the lowest loaded item from the second selection…so on and so forth (see Little et al (2002) p.166 for more details).

[4] Multicollinearity was also assessed by calculating the squared multiple correlations between each variable and all the rest with values greater than 0.90 being of concern (Kline, 1998). This value was not reached by any of the retained items. We also assessed collinearity by computing the tolerance and variance inflationary factor (VIF) for each of the variables. If a set of explanatory variables is uncorrelated then its VIF will be equal or close to 1. In common practice, a tolerance of less than 0.20 and/or a VIF of 5 and above indicates a multicollinearity problem. With VIF values ranging from 1.138 to 1.640, multicollinearity was not felt to be an issue. Issues related to kurtosis and skewness of the sample data were not felt to be problematic with values ranging from 0.005 to 1.149 for the former and 0.046 to .718 for the latter.

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TABLES AND FIGURES

Figure 1: Theoretical Model and Hypotheses

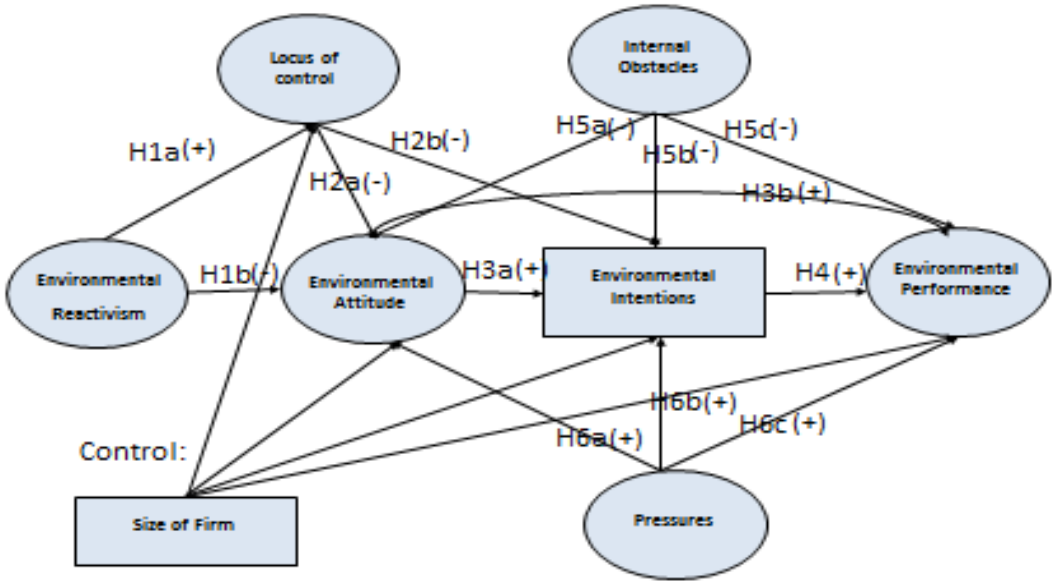


Figure 2 – Study Timeline

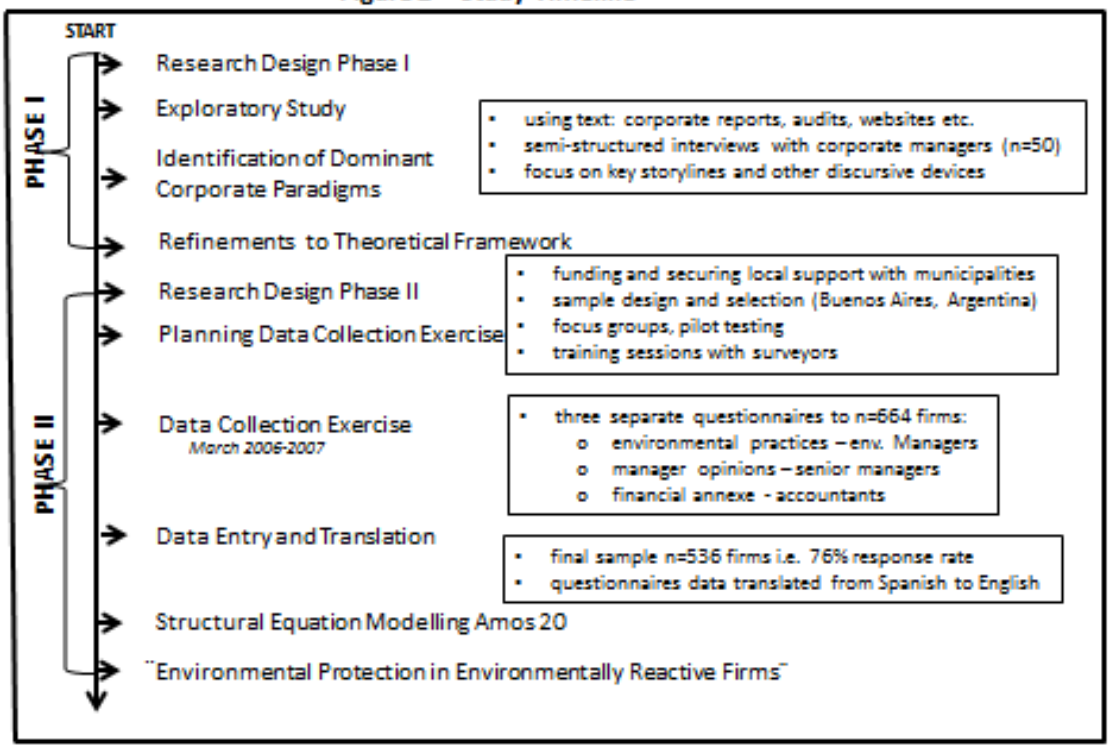
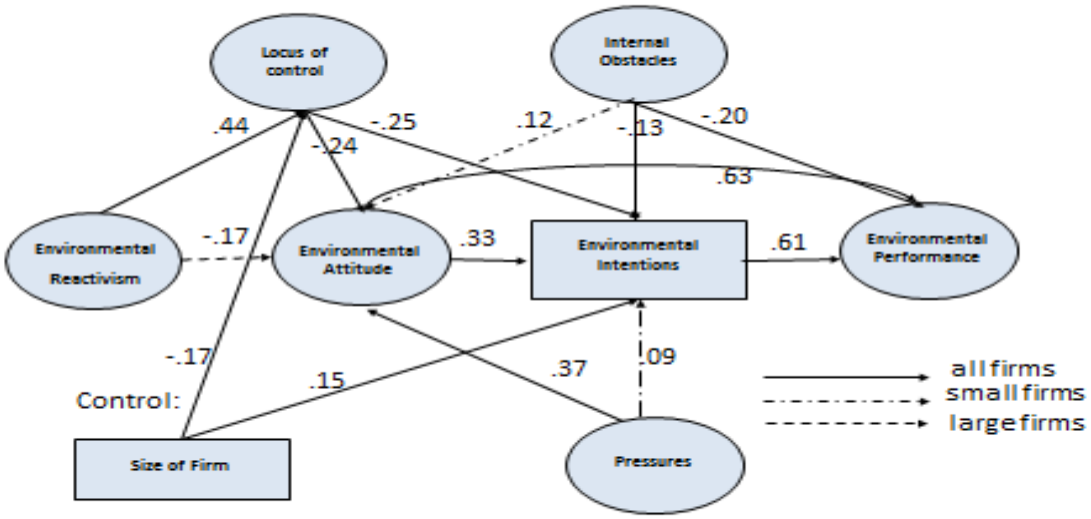


Fig. 3: Standardised Path Estimates



Note: Only statistical significant path estimates are shown (p<.05); CMIN/DF=1.936; CFI=.962; PRATIO=.723; RMSEA=.043 χ^2=356.25; df=184; p<.05. The analyses includes all firms.

Table I. ENVIRONMENTAL REACTIVISM (H1a, H1b)

To what extent do you agree with the following statements? [1=strongly disagree to 5=strongly agree]	MEAN	S.D.	Factor loadings
A firm's responsibilities to its customers, shareholders and employees should be prioritised over its responsibilities towards the environment. V222a	2.37	1.20	.670
A firm's responsibility is to comply with regulations set by the State. V222b	3.16	1.22	.548
A firm's environmental efforts should commensurate with its economic performance. V222c	2.87	1.15	.599
The ethical responsibility of the firm is to be profitable. V222h	2.84	125	.509
It is the role of the government – not the firm's – to protect the environment.V225a	2.62	1.34	.460
N=5 items; Cronbach Alpha = 0.72 (without factor weights); KMO=.76; BST=367.719 DF=10 p<.05			
Construct influenced by Dryzek (1997) and Bansal (2003).			

Table II. MANAGERIAL LOCUS OF CONTROL (H2a, H2b)

To what extent do you agree with the following statements? [1=strongly disagree to 5=strongly agree]	MEAN	S.D.	Factor Loadings
I have insufficient knowledge to influence env. practices at my firm. V223a	2.71	1.28	.452
My firm has insufficient resources to improve the environment. V223d	2.78	1.39	.673
My firm cannot improve the environment and remain competitive. V223e	2.49	1.37	.845
It is difficult for my firm to remain successful and improve the env. V223f	2.20	1.31	.675
N=4 items; Cronbach Alpha = 0.75; KMO=.74; BST=510.875 DF=6 p<.05			
Construct influenced by Aragon-Correa (1998) and Hillary (2000)			

Table III. ENV. PERFORMANCE ATTITUDE (PERFATTITUDE –H3a, H3b, H3c)

Abstracting from the level of success experienced by your firm in the implementation of the following environmental actions, how important do you think adherence to these environmental actions are in general? [1=very unimportant to 5=very important]	MEAN	S.D.	Factor Loadings	Parcels
Adherence to env mgt. system voluntary standards (e.g. ISO1401) v152c	3.42	1.37	.598	Parcel 2
Internal environmental assessment requirements. V152d	3.49	1.36	.634	Parcel 1
Adherence to EMS voluntary standards (e.g. ISO1401). V152e	3.84	1.21	.749	Parcel 3
Recycling products/by-products/waste. V152f	3.76	1.35	.743	Parcel 1
Remanufacturing. V152g	3.34	1.46	.655	Parcel 3
Investment in R&D of env. friendly products/production. V152l	3.36	1.37	.645	Parcel 3
Rational use of scarce and/or non-renewable raw materials. V152m	3.99	1.22	.763	Parcel 2
Imposing env. standards/audits on suppliers/distributors/buyers. V152o	3.58	1.28	.743	Parcel 1
Developing cleaner manufacturing processes V152p	3.98	1.24	.722	Parcel 2
N=9 items; Cronbach Alpha = 0.89; KMO=.89; BST=2067.80 ; DF=36 ; p<.05				
Construct influenced by Bamber & Moser (2007) and Hines et al (1987).				

Table IV. ENVIRONMENTAL MANAGEMENT INTENTIONS (EMI – H4)

Var.	Indicators	Variable values	Mean (s.d.)
PE	Green label	0=no green labels, 1=green labels	.18 (.38)
PA	Env. plan	0=no env. plan, 1=env. Plan	.47(.49)
EIA	Env. impact assessment	0=no; 0.5=in process;1=approved	.28(.42)
ISO	Env. management system	0=no EMS, 1=Ems	.17 (.38)
CAP	Env. training	0=no training, 1=training	.31 (.46)
AUD	Env. audits	variable range where 0=no assessment, 1=monthly assessments	.30 (.14)
SIN	Env. synergies in (processes,inputs, & outputs)	Variable range where 0=no synergies, 1=synergies	.13(.21)
DIV	Env.disclosure	0=no, 0.25 =if <once a year 0.5 =if once a year; 0.75 =if twice a year; 1=if>once a mth.	.05 (.21)
NGO	Collaboration with env. NGOs	0=no; 1=yes	.05 (.20)
INV	Investment in env. R&D	0=no; 1=yes	.11 (.25)
POL	Env. policy	0=no; 1=yes	.44(.49)
N=11 items; scale adapted from Chudnovsky et al (1997). mean=.60; s.d.=.56			

Table V. INTERNAL OBSTACLES (INTOBS – H5a, H5b, H5c)

How important do you think the following factors are in preventing improvements in the environmental performance of your firm? [1=not important at all to 5=very important]	MEAN	S.D.	Factor Loadings	Parcels
A lack of knowledge about relevant technologies. V142a	2.89	1.31	.793	Parcel 2
A lack of information on how to implement clean production. V142b	2.88	1.35	.827	Parcel 1
A lack of training at management level. V142c	3.14	1.32	.795	Parcel 3
A lack of training at operational level. V142d	3.04	1.27	.739	Parcel 3
A lack of emphasis on env. mgt. by the leaders of the firm. V142e	2.65	1.41	.743	Parcel 1
A lack of time. V142f	2.92	1.33	.590	Parcel 1
A lack of economic resources. V142g	3.56	1.35	.606	Parcel 3
A lack of awareness about the env. consequences of processes V142h	2.75	1.39	.804	Parcel 2
A lack of available measures (e.g. effluents, water, pollutants). V142i	2.73	1.36	.771	Parcel 3
An inability to identify and remediate non-compliance. V142j	2.58	1.35	.788	Parcel 1
The high costs of clean production systems. V142k	3.26	1.34	.647	Parcel 1
The short term standards imposed by regulation. V142l	2.90	1.31	.624	Parcel 2
The costs of maintenance of end-of-pipe technologies. V142m	2.79	1.39	.689	Parcel 2
N=13 items; Cronbach Alpha= 0.94; KMO=.934; BST=3741.853; DF=78; p<.05				
Construct influenced by Dasgupta et al (2000).				

Table VI. PRESSURES (PRESS – H6a, H6b, H6c)

How important might the following factors be in persuading your firm to improve its environmental performance? [1=not important at all to 5=very important]	Mean	S.D.	Factor Loading	Parcel Model 2	Parcel Model 3
Non-compliance fines. V214a	3.93	1.24	.486	Parcel 1	Parcel 1
Judicial closures. V214c	3.92	1.31	.588	Parcel 1	Parcel 1
Penal liabilities for managers. V214d	3.86	1.31	.581	Parcel 3	Parcel 3
Environmental requirements by national buyers/suppliers. V214f	3.32	1.43	.559	Parcel 3	Parcel 3
Environmental requirements by foreign buyers/suppliers. V214 g	3.16	1.50	.616	Parcel 2	Parcel 2
Customer preferences for 'greener' products. V214h	3.48	1.37	.745	Parcel 1	Parcel 1
Access to new markets. V214i	3.77	1.32	.728	Parcel 1	Parcel 1
A green internal corporate policy. V214j	3.62	1.27	.523	Parcel 2	Parcel 2
Product differentiation. V214n	3.96	1.24	.684	Parcel 3	Parcel 3
Gaining a competitive advantage over rival firms. V214p	3.82	1.26	.730	Parcel 2	Parcel 2
The possibility of lagging behind other firms. V214q	3.62	1.32	.742	Parcel 2	Parcel 2
The risk of acquiring a 'bad' public image. V214r	3.84	1.29	.692	Parcel 3	Parcel 3
N=12 items ; Cronbach Alpha=0.88; KMO=.843; BST=3219.225; DF=66; p<.05					
Construct influenced by Sharma & Henriques (2005), Angell & Rands (2003), Dasgupta et al (2000), Henriques & Sadorsky (1996), Balogun & Johnson (2005).					

Table VII. ENVIRONMENTAL PERFORMANCE (Dependent Variable)

How do you assess the level of success experienced by your firm in the implementation of the following environmental actions? [1=very poor to 5=very good]	Mean	S.D.	Factor Loadings	Parcels Model 2	Parcels Model 3
Full compliance with existing environmental regs. V151a	3.68	1.30	.520	Parcel 1	Parcel 2
Internal environmental assessment requirements. V151c	2.50	1.45	.649	Parcel 1	Parcel 2
Up-to-date treatment technologies. V151d	2.88	1.43	.647	Parcel 1	Parcel 2
Recycling of products/sub-products/waste. V151e	3.06	1.57	.668	Parcel 3	Parcel 2
Constant improvements of processes. V151f	3.50	1.27	.690	Parcel 1	Parcel 2
Effluents/waste minimization. V151i	3.61	1.33	.716	Parcel 2	Parcel 1
Constant improvements of processes V151h	3.50	1.27	.668	Parcel 2	Parcel 1
Reduction in water and energy consumption. V151j	3.81	1.24	.596	Parcel 3	Parcel 1
Rational use of scarce and/or non-renewable raw materials. V151m	3.09	1.52	.601	Parcel 2	Parcel 1
Reduction of hazardous emissions. V151n	3.39	1.62	.705	Parcel 3	Parcel 1
Development of cleaner manufacturing processes V151p	3.26	1.40	.556	Parcel 3	Parcel 1
N=11 items; Cronbach Alpha=0.87; KMO=.883; BST=1764.115 ; DF=55; p<.05					
Construct adapted from Chudnovsky (1997).					

Table VIII. Descriptive Statistics, Correlations and Reliability Coefficients

Construct/Variable	Mean	SD	1	2	3	4	5	6	7	
1. Environmental Reactivism	13.87	4.10	*0.72*							
2. Managerial Locus of Control	10.60	3.69	.31**	*0.75*						
3. Environmental Attitude	32.69	8.68	-.14**	-.15**	*0.89*					
4. Environmental Intentions	2.93	2.28	-.20**	-.38**	.40**	N.A.				
5. Internal Obstacles	38.05	13.00	.12**	.26**	.10**	-.18**	*0.94*			
6. Stakeholder Pressures	44.44	10.53	-.02	-.01	.38**	.20**	.15**	*0.88*		
7. Environmental Performance	34.13	10.24	-.15**	-.34**	.51**	.69**	-.22**	.22**	*0.87*	
8. SIZE	97.07	319.99	-.15**	-.23	.11**	.26**	-.09	.02	.17**	N.A.

Alpha reliabilities for latent variables are in italic on the diagonal; **p<0.05; Environmental intentions and size are manifest variables.

Table IX: Fit indicators – Measurement and Structural Models

Model Fit Summary	**Measurement Model 1** All firms	**Measurement Model 2** All firms	**Measurement Model 3** All firms	**Structural Model 2** All firms	**Structural Model 3a** All firms	**Structural Model 3b** Small firms	**Structural Model 3c** Large firms
Chi-Square[a]	χ^2=2708.593; df=1323; p<.005	χ^2=386.626 df=174; p<.005	χ^2=324.222. df=155; p<.005	χ^2=436.801 df=207 p<.05	χ^2=356.25 df=184 p<.05	χ^2=290.698 df=167 p<.05	χ^2=295.528 df=167 p<.05
CMIN/DF[b]	2.014	2.222	2.092	2.111	1.936	1.741	1.770
CFI[c]	.902	.959	.959	.962	.962	.965	.937
RMSEA[d] LO90,HI90 PCLOSE	.045 (.042,.047) .565	.049 (.043,.056) .565	.047 (.039,.054) .782	.047 (.041,.053) .777	.043 (.036,.050) .956	.042 (.033,.049) .962	.064 (.052,.076) .029
PRATIO[e] PNFI PCFI	.888 .732 .801	.753 .699 .722	.738 .683 .708	.747 .695 .719	.727 .673 .700	.723 .668 .698	.723 .628 .677
Hoelter Index[f] (.05,.01)	N=267 N=274	N=269 N=288	N=288 N=310	N=281 N=300	N=307 N=328	N=293 N=314	N=126 N=135

a. Ideally, we want p>.05 but this is rarely possible in large samples. (Byrne, 2001)
b. Values below 3 are indicative of a good model (Kline, 1998).
c. Comparative fit index. Values >.90 (>.95) are indicative of good and very good fit respectively (Byrne, 2001).
d. Root mean square error of approximation. Values <.05 represent very good fit while values <.08 are acceptable. (Byrne, 2001)
e. These indicators 'penalise' the model for having too many parameters. Values above .50 are associated with good fit (Mulaik, Van Altine, Bennett, Lind and Stilwell, 1989).
f. States the sample size at which the χ^2 would not be significant. Hoelter (1983) proposed that a value in excess of 200 is indicative of a model that adequately represents the sample data.

**with internally consistent facets (parcels) for PRESSURES, ENVPERF;
Structural Model 2a includes all firms; Model 2b includes small firms (n<99 employees); Model 2c includes large firms (n>100 employees).

Table X: Maximum Likelihood Regression Weights – Model Relationships

Regression Relationships			All firms β Stand. Estimate (S.E.)	Small firms β Stand. Estimate (S.E.)	Large firms β Stand. Estimate (S.E.)	Qual. Diff?
(H1a) Managerial Locus of Control	<---	Environmental Reactivism	.40** (.05)	.44** (.05)	.45** (.09)	No
(H1b) Environmental Attitude	<---	Environmental Reactivism	-.00 (.22)	.03 (.23)	-.17* (.34)	Yes
(H2a) Environmental Attitude	<---	Managerial Locus of Control	-.21** (.30)	-.23** (.41)	-.17* (.40)	No
(H2b) Env. Mgt. Intentions	<---	Managerial Locus of Control	-.18** (.20)	-.22** (.25)	-.18* .(31)	No
(H3a) Env. Mgt. Intentions	<---	Environmental Attitude	.32** (.04)	.28** (.04)	.44** (.07)	No
(H3b) Env. Performance	<---	Environmental Attitude	.54** (.28)	.59** (.34)	.60** (.34)	No
(H4) Env. Performance	<---	Env. Mgt. Intentions	.60** (.10)	.57** (.13)	.57** (.14)	No
(H5a) Environmental Attitude	<---	Internal Obstacles	.10* (.04)	.15** (.04)	-.08 (.06)	Yes
(H5b) Env. Mgt. Intentions	<---	Internal Obstacles	-.16** (.03)	-.09* (.03)	-.20** (.05)	No
(H5c) Env. Performance	<---	Internal Obstacles	-.19** (.05)	-.21** (.07)	-.17** (.09)	No
(H6a) Environmental Attitude	<---	Pressures	.44** (.03)	.43** (.03)	.48** (.04)	No
(H6b) Env. Mgt Intentions	<---	Pressures	.15** (.02)	.15** (.02)	.09 (.03)	Yes
(H6c) Env. Performance	<---	Pressures	-.12 (.07)	-.12 (.09)	-.13 (.09)	No
Managerial Locus of Control	<---	Size	-.16** (.00)	N.A.	N.A.	N.A.
Environmental Attitude	<---	Size	.08 (.00)	N. A.	N. A.	N. A.
Env. Mgt. Intentions	<---	Size	.14** (.00)	N.A.	N.A.	N.A.
Environmental Performance	<---	Size	.01 (.00)	N. A.	N. A.	N. A.

*** p<.01; *p<.05*