

**ASTROTURFING GLOBAL WARMING:
IT ISN'T ALWAYS GREEN ON THE OTHER SIDE OF THE FENCE**

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ABSTRACT

Astroturf organizations are fake grassroots organizations usually sponsored by large corporations to support any arguments or claims in their favor, or to challenge and deny those against them. They constitute the corporate version of grassroots social movements, which proactively connect people locally with the aim to foster pro-social and pro-environmental issues. Serious ethical and societal concerns underline the astroturfing practice, especially if corporations are successful in influencing public opinion by borrowing a social movement approach. This study is motivated by this very issue and examines the effectiveness of astroturf organizations in the global warming context, wherein large corporate polluters have an incentive to set up astroturf organizations to undermine the importance of human activities in climate change. We conduct an experiment to determine whether astroturf organizations' websites impact the level of user certainty about the causes of global warming. Results show that people who used astroturf websites became more uncertain about the existence of global warming and humans' role in the phenomenon than people who used the grassroots website. Astroturf organizations are hence successful in their promotion of business interests over environmental protection. Aside from the multiple business ethics issues it raises, the astroturfing strategy poses a significant threat to the legitimacy of the grassroots movement.

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1. Introduction

United States President Obama's call for action on the issue of global warming seems to have turned out in vain, as illustrated by the recent study published by the Pew Research Centre in 2009. The latter shows that the majority of Americans (1) believe that the burning of fossil fuels and other human activities are *not* responsible for global warming and (2) do *not* view global warming as a very serious problem (Goldenberg, 2009; Pew Research Centre, 2010). These results, however, contrast sharply when scientists are surveyed, but also with the Intergovernmental Panel on Climate Change's Nobel Peace Prize-winning report indicating that global warming is unequivocal and there is at least a 90% likelihood it is caused by human activity (Intergovernmental Panel on Climate Change, 2007).

Why such a disparity? Perhaps this apparent state of great confusion and uncertainty can be somewhat indirectly attributed to the Western Fuels Association delivering, for free, to public and university libraries across the United States hundreds of copies of their *Greening of Planet Earth* video, which shows that plants on earth are *lacking* carbon dioxide and an increase in atmospheric carbon will provide a *more fertile* world – a potentially serious avenue for confusion for a university first-year student (Hoggan and Littlemore, 2009); or, the Heartland Institute sending thousands of brochures and DVDs to Canadian schools pushing them to teach their students that scientists have been exaggerating the effects of human activity on global warming (De Souza, 2008).

Besides targeted educational institutions, the common thread in both of these examples is rejecting the scientific consensus and “convincing many of the public, and often the media too, that the consensus is not based on ‘sound science’ or denying that there is a consensus by exhibiting individual dissenting voices [...]” (Diethelm and Mckee, 2009, p.2). Such convincing efforts to reject the case for taking action to fight threats to society and the environment are part of a larger phenomenon known as *denialism*, “the employment of rhetorical arguments to give the appearance of legitimate debate where there is none” (Hoofnagle and Hoofnagle, 2010). In the socio-political and organizational context, these global warming *denialists* are astroturf organizations. The term comes from “AstroTurf”, which is a brand of synthetic carpeting designed to *look like* natural grass but is in fact *fake* grass (generally used for sports fields). Hence, astroturf organizations are simply fake grassroots organizations usually created and/or sponsored by large corporations to support any arguments or claims in their favor, or to challenge and deny those against them. Not surprisingly, the use of astroturf organizations appears to be common for political activities (see, e.g., Krashinsky, 2009; Mackenzie and Pickard, 2009). We believe this phenomenon to be a major concern for society as a whole if large organizations are successful in influencing people’s beliefs and perceptions by funding and using astroturf organizations. We argue that such activity purposefully designed to fulfill corporate agendas represents a serious lapse in ethical conduct.¹

This investigation is motivated largely by the denialism, and more specifically the astroturfing, phenomenon described above. In particular, we seek to determine whether

¹ In fact, public relations associations discourage the use of astroturfing in their codes of ethics (Fitzpatrick and Palenchar, 2006).

people actually trust astroturf organizations in terms of their existence and their messages about this specific issue and, more importantly, also whether these messages affect or change their beliefs about the causes of global warming (human vs. nature).

Accordingly, in this study we draw upon theory about rhetoric (Green, Babb and Alpaslan, 2008; Hartelius and Browning, 2008) as it applies to the language of legitimacy (Suddaby and Greenwood, 2005) to conduct an experiment to determine whether astroturf organizations' websites and information therein appears to impact the level of user certainty and beliefs about the causes of global warming. We argue that such impact is possible if astroturf organizations themselves are effective, which could constitute grounds for great ethical and societal concern.

Our study extends the business ethics literature in two ways. First, existing research in astroturfing primarily focuses on the relationship between astroturf groups or organizations, their sponsor companies, and other relevant stakeholders such as legislators. To the best of our knowledge, no studies to date have examined the direct impact that astroturfing exerts on people's beliefs and perceptions. Second and importantly, similar to Cho, Patten and Roberts (2006), we connect our findings to wider business ethics issues in regards to the extent to which it is appropriate for corporations to be implicated in such activities. Significant ethical concerns have been raised because corporations have taken advantage of their influence to solely maximize shareholder interests, not to benefit other segments of society (see, e.g, Roberts and Bobek, 2004).

2. Background and Hypotheses

2.1 Overview on Corporate Political Strategies

Suarez (1998) suggests that the influential position enjoyed by business in American politics (Eismeier and Pollock, 1988; Smith, 2000) constitutes a driver for corporations to develop political strategies that maximize their political power and complement their overall business agenda. This is particularly true when the outcomes of public policy are potentially going to affect their business interests, leading them to become more politically active (Humphries, 1991). Hillman and Hitt (1999) integrated the diffused literature on corporate political strategies into a three-stage sequential decision comprehensive model, which is presented in Table 1, as summarized by Roberts, Dwyer and Sweeney (2003). We briefly focus on the third decision phase of the overall model – strategies and tactics – and more specifically on the “financial incentive” and “constituency-building” strategies.

A financial incentive strategy basically consists of an attempt to serve the interests of the corporation by influencing policy outcomes through the use of financial means. In the US, one commonly used financial tactic is to make a political contribution to a legislator’s campaign via a political action committee² (PAC) or individual efforts (Center for Responsive Politics, 2010). Other financial incentive tactics also include offering legislators with honoraria or covered travel expenses for speaking engagements,

² The 1974 amendments to the Federal Election Campaign Act (FECA) allow companies to support federal candidates for legislative offices by forming corporate political action committees (PACs). A corporate PAC is a separate legal entity established by a corporate “parent” (or sponsor) and financed by “donors”, without whose support the PAC would not be viable (Eismeier and Pollock, 1988). The sole purpose of a PAC is to collect campaign funds and disburse them to federal candidates (Mack, 1997; Ryan, Swanson, and Buchholz, 1987). PAC contributions help corporations gain access to legislators and regulators to discuss their positions on proposed legislation in an attempt to influence policy outcomes (Hillman and Hitt, 1999; Mack, 1997). Since their allowed existence through FECA, the number of corporate PACs has sharply increased from 89 in 1974 to reach over 2,000 making contributions in 2006.

or hiring personnel with political experience in the key policy areas of interest to the organization (Hillman and Hitt, 1999; Roberts et al., 2003). For example, PAC contributions have been utilized as a financial incentive tactic to influence legislators and policymakers on matters relevant to a number of respective industries such as tobacco (see, e.g., Luke and Kraus, 2004), cable television (see, e.g., Cohen and Hamman, 2003), the accounting profession (see, e.g., Roberts et al., 2003; Thornburg and Roberts, 2008) and car dealers (see, e.g., Stern, 1988). In particular, PACs from the Energy and Natural Resources sector had already outnumbered those from other industries throughout the mid-1980s and consistently ranked among the highest political campaign contributors (Center for Responsive Politics, 2010; Eismeier and Pollock, 1988). And, while corporate PACs contributed over \$200 million³ to congressional candidates during the 2006 election cycle, the Energy and Natural Resources sector alone donated over \$22 million in PAC contributions during that same cycle (Center for Responsive Politics, 2010). More specifically, Cho, Chen and Roberts (2008) show how a sample of firms in the chemical and petroleum industries similarly directed their PAC funds towards legislators deemed influential in a controversial piece of legislation that was passed in the U.S. immediately after the Bhopal disaster of 1984. The results of Cho et al. (2008) suggest that these industries sought to use their PACs in order to subvert legislation that sought to increase corporate accountability on environmental pollution issues.

On the other hand, a constituency-building strategy makes an effort to indirectly affect public policy. Hence, a firm's constituency and/or the general public is generally

³ It is important to note the limitation on the dollar amount of campaign contributions according to FEC regulations. Groups and individuals may donate up to \$5,000 to a single PAC per calendar year. In turn, PACs may contribute up to \$5,000 to any candidate or his/her authorized committee per election (Center for Responsive Politics, 2010; Mack, 1997).

involved and such strategy is most likely to be used during the public opinion formation stage of a particular policy, and if an organization has a large employment or membership base. Typical constituency-building tactics involve grassroots efforts (i.e., generating the involvement of a legislator's local voting constituency), advocacy advertising, political education programs, public relations campaigns, and press conferences.

2.2 *Grassroots or Astroturf?*

In more general terms, grassroots organizations are defined as “local political organizations which seek to influence conditions not related to the working situation of the participants and which have the activity of the participants as their primary resource” (Gundelach, 1979, p. 187). As such, in contrast to traditional political power structures, grassroots organizations or movements often operate at the *local* level and are generally fueled by *community* volunteers who give their time and resources to support a specific cause. Their primary objective is therefore to work their way upward from collective efforts to support a local – and often national and global – cause of social and/or political nature they deem good for society; their procedures generally include hosting house meetings, putting up posters, setting up websites, talking with people on the street, gathering signatures for petitions, raising money from small donors to support political campaigns, etc...

However, while grassroots movements are typically known to proactively connect people locally about pro-social and pro-environmental issues (e.g., human rights, against child labor, against pollution, etc...), corporations appear to also engage in grassroots efforts as part of their constituency-building strategies. Grassroots movements can also be used by corporations themselves, in the sense that they can make an attempt to

influence and convince their local constituents by advocating facts and arguments aligned with their business interests. As discussed above, this case of *faking* a grassroots movement is called *astroturfing*. Hoggan and Littlemore (2009) simply define an astroturf group as a “fake grassroots organization animated by a clever public relations campaign and a huge budget” (p. 36). A commonly cited example of astroturfing activities often mentioned in the general media is the alleged large-scale campaign and funding support from ExxonMobil Corporation toward creating and funding “think tanks” that spread false information about global warming and climate change science (Greenpeace USA, 2007).

A few prior studies examine the issue of astroturfing in the organizational and political context from various different perspectives and definitions. Tsoukalas and Glantz (2003) and Apollonio and Bero (2007) describe the astroturfing activities of the tobacco industry in terms of processes, success and implications for the public. Lyon and Maxwell (2004) take a slightly definition of astroturfing (i.e., a strategy “in which a firm that knows the state of the world subsidizes the lobbying activities of a group with similar views” (p.594)) and, using analytical modeling, show that a law requiring disclosure of astroturfing expenditures would reduce the effectiveness of astroturfing and this would be desirable by the public decision-maker. Mattingly (2006) investigates qualitatively the overall process of corporate political actions by interviewing public relations representatives from industry associations and corporations and a representative from the state legislature. He reports that corporations will be more successful in influencing public policy when the organization accumulates sufficient credibility through PACs, grassroots and development of relationships with legislators. Astroturfing is

acknowledged by a participant as something to avoid because legislators see through the attempt to manipulate. Fitzpatrick and Palenchar (2006) examine whether governments could force corporations to reveal their participation in front groups without violating constitutional rights. Their findings indicate that legislators are expected to approve legislation on the disclosure of front group⁴ financing in the coming years.

This limited number of prior studies on astroturfing primarily focus on the more macro-based, organizational (whether it is the corporation per se or the astroturf organization) side of the phenomenon. However, little research has been conducted experimentally at the individual level, for example, on the extent to which astroturfing strategies are effective. We identified a study by Pfau, Haigh, Sims and Wigley (2007), who assessed the influence of corporate front-group stealth campaigns and examined the effects of post hoc exposure of their deceptive practices. Using an experimental scenario of a front-group stealth campaign, they find that such campaigns succeed in influencing public opinion in the direction hoped for by the corporations and boost perceptions of the front group itself but not perceptions of the corporations behind it (the corporate sponsors). Overall, front-group stealth campaign “exert significant influence on public attitudes” (p. 94) and can be counteracted by post hoc exposure and pre-emptive warning.

One specific but implied objective of astroturf organizations is to increase or instill confusion and uncertainty to the general public about a sensitive issue such as global warming. This conjecture is in line with the American Petroleum Institute (API),

⁴ “Front groups are controversial public relations techniques used by organizations to influence public opinion and public policy on behalf of undisclosed special interests. The groups are created to pursue public policy objectives for organizations that disguise their connection (e.g., financial support) with the effort while attempting to appear independent. The typical objective of front groups is to convince public policymakers that citizen support skews in a particular direction or to influence outcomes in local, state, and national elections.” (Fitzpatrick and Palenchar, 2006, p.203). Hence, it appears that a “front group” is similar to an astroturf organization except that it focuses more specifically on influencing policymakers and election outcomes.

which released a “Global Climate Science Communication Action Plan” in 1998. The document clearly states that its purpose is to convince the public, through the media, that climate science is in deep uncertainty. It further states that victory will be achieved when, among others, average citizens and the media recognize uncertainties in climate science (and recognition of uncertainties becomes part of the conventional wisdom), media coverage reflects balance on climate science, and those promoting the Kyoto protocol treaty on the basis of extant science appear to be out of touch with reality (Hoggan and Littlemore, 2009).

2.3 Rhetoric and Legitimacy

A key foundation for the use of corporate political strategies is the concept of legitimacy - “a generalized perception or assumption that the actions of an entity are desirable, proper, or appropriate within some socially constructed system of norms, values, beliefs, and definitions” (Suchman, 1995, p.574). Corporate political strategies are typically aimed at maintaining the status quo (Tyler, 2006) while grassroots activities are typically aimed at creating new norms (Greenwood, Suddaby and Hinings, 2002). This clash between an established norm, value, or belief, termed an institutional logic, and an emerging norm, value or belief triggers social conflict (Eisenstadt, 1980) as competing interests challenge a contested terrain (Rao and Singh, 1999). This contest is a political game as the competing interests present and contest arguments between a dominant institutional logic and an emergent logic consistent with their self-interests (Hensmans, 2003). Hence, rhetorical strategies are a key tool used by actors as they defend established logics against change (Suddaby and Greenwood, 2005).

Institutional logics are the deeply held and generally unexamined assumptions used by broad social institutions to shape how we interpret and act upon the world at large (Friedland and Alford, 1991). By unconsciously following established logics, we are able to act upon the world by reducing uncertainty about the world because we place trust in these broader social institutions (Sitkin and George, 2005). Multiple social institutions create multiple institutional logics, often competing and contradictory. In discussing the nature of competing institutional logic, Seo and Creed (2002) argue that actors aware of these contradictions are more likely to act to create or inhibit change.

Suchman (1995) describes three types of legitimacy that maintain the underlying assumptions supporting institutional logics. This includes pragmatic legitimacy – a calculation of self-interest by an actor, whether or not something serves the interests of the actor or society; moral legitimacy – a normative evaluation of the behaviour of an entity, whether or not something is the right thing to do; and cognitive legitimacy – a taken-for-granted assumption that leads to acceptance as inevitable. Competing logics may draw upon these different types of legitimacy leading to the contestation between established and emergent logics.

Legitimacy allows actors to act more confidently in the world by reducing uncertainty about their actions (Ashforth and Gibbs, 1990). This is consistent with, and follows from, the definition of legitimacy. An actor or entity believes that their actions are appropriate when they engage in behaviour that is consistent with the expectations of the socially constructed system in which they operate. This reduces uncertainty about the appropriateness of actions by conforming to the legitimized expectations of its relevant audience (Aldrich and Fiol, 1994). Zimmerman and Zeitz (2002) argue that legitimacy is

a basis for decision making. They contend that social systems create “prescribed scripts, rules, norms, values, and models that are socially reinforced throughout the system” as a way of dealing with chronic condition of uncertainty found in society. They argue “When faced with uncertain decisions..., social actors refer back to this stock of scripts, rules, norms, values, and models in order to proceed” (Zimmerman and Zeitz, 2002, p.416). Trust is also an important element of legitimacy. Actors that act in ways that are consistent with the dominant institutional logic are deemed to be more credible and therefore more trustworthy (Suchman, 1995). Conversely, actors that act in illegitimate ways are considered irrational, less credible, and therefore less trustworthy.

At the field level where institutional logics operate, uncertainty and trust are critical to the rhetorics that control how we interpret and act upon the world, especially under conditions of contradictory logics. Suddaby and Greenwood (2005) argue that contradictions in institutional logics create the conditions by which shifts in logics may occur and that rhetorical strategies determine whether these shifts occur or are resisted. These shifts happen (or not) “when actors manipulate the degree of uncertainty implied by an innovation” (Suddaby and Greenwood, 2005:59). They argue that rhetorical strategies are used to manipulate institutional meaning systems using vocabularies to dampen or “amplify contradictions of meaning inherent in institutional logics in efforts to displace or affirm the dominant logic.” One method of manipulating meaning systems is through the use of narratives (Hartelius and Browning, 2008). Hartelius and Browning (2008:31) argue that “a shared narrative provides the fundamental social cohesion within any organizational environment.” Narratives serve as the means by which scripts, rules, norms, values, and models are transmitted and how socially constructed systems, the

institutional logics, are shaped and controlled. Thus the language used in narratives can be used to help reduce uncertainty and increase trust by helping people act in an uncertain world leading to greater legitimacy for the logic underlying the narrative. Conversely attacking a narrative can be used to increase uncertainty and decrease trust by making people question the legitimacy of the logic underlying the narrative.

2.4 Development of Hypotheses

We argue that the global warming issue represents a clash of competing institutional logics and narratives about these logics. The dominant method for generating energy in today's world is various carbon-based means (primarily oil and coal). That most people drive cars, heat their homes, and use electricity using carbon-based methods suggests that a carbon-based energy economy is a prevailing dominant institutional logic based on pragmatic legitimacy. We appear to accept it because it is in our immediate self-interests to use this cheap and readily available energy. We argue that human-caused global warming is a contradictory logic because it relies on a narrative that is counter to the carbon-based energy narrative. The basic narrative from scientists argues that global warming is being caused by human activity through the use of carbon-based energy and that global warming is causing harm to the planet (Intergovernmental Panel on Climate Change, 2007). This narrative rests on moral legitimacy, that the right thing to do is reduce our use of carbon-based energy. Thus the global warming narrative directly challenges the carbon-based energy narrative.

Actors on both sides of this contested field of logics are likely aware of the contradictions and challenges posed by their narratives of choice. In this contest, we contend that the carbon-based energy narrative is an established and legitimized narrative

whereas the global warming narrative is the emergent challenger. Actors defending the carbon-based energy narrative are creating astroturf organizations in order to challenge and destabilize the emergent global warming narrative. By challenging the emergent narrative, levels of uncertainty and beliefs about global warming, astroturf organizations are decreasing the legitimacy of the global warming narrative. If their rhetoric is effective, we hypothesize that:

H₁: Viewing information from astroturf organization websites will increase uncertainty levels about the causes of global warming compared to viewing information from grassroots organizations.

H₂: Viewing information from astroturf organization websites will decrease the belief that humans are responsible for the underlying causes of global warming compared to viewing information from grassroots organizations.

Broad-based disclosures can be used by the actors of the present contested field of logic to gain or maintain their legitimacy (Gray, Kouhy and Lavers, 1995; Deegan 2002; Cho and Patten, 2007). In addition to the overall message they send through the disclosure of the astroturf organization, proponents of the carbon-based energy narrative can resort to specific pieces of information to reinforce the legitimacy of their established narrative (Patten, 2005). Information users are influenced by the disclosure of information and respond by strengthening the legitimacy they confer to the discloser. For instance, disclosing detailed information about operational activities on the corporate website renders a corporation more credible in the eyes of certain users (Bansal and Kistruck, 2006). Similarly, under certain circumstances positive environmental disclosures are successful in offsetting negative effects in people's minds (Milne and Patten, 2002). In the context of climate change, astroturf organizations could use specific funding information disclosure strategy in order to reinforce their legitimacy. Such strategy could

vary from no disclosure about any funding source to conspicuously disclosing that the organization is funded by seemingly environmental foundations or the like. Such strategy could potentially provide more credibility to astroturf organizations while creating an appearance of increased transparency. Hence, we expect that:

H₃: Disclosure of funding sources will moderate the effect of astroturf organization websites on global warming uncertainty levels and beliefs.

3. Research Method

In order to determine the extent to which people's trust and certainty levels are affected by the actual astroturf organizations and their messages exhibited on their websites, we conducted a lab experiment using a four-by-two between-subjects design. The section below details the participants, the experimental task, the experimental procedures and the measurement of variables.

3.1 Participants and Experimental Task

Two hundred and seventy-eight undergraduate students⁵ enrolled in accounting classes at a large Canadian university participated in the study in exchange for course credits. Table 2 reports demographic information concerning the 278 final sample participants.⁶

----- Table 2 about here -----

⁵ There were six additional participants who did not complete the survey after viewing the website. Thus, responses from these participants were dropped from the final data set.

⁶ Separate from these students from accounting classes (n = 151), we had also recruited students from marketing classes in exchange for cash compensation and performed the same study. Unexpectedly and for unknown reasons, we observed differences in measures we collected *prior* to the introduction of manipulations, which may raise the issue concerning failure of randomization. However, these results were qualitatively similar to the current study's results reported here, in terms of the impacts of viewing astroturf organization vs. grassroots websites on uncertainty, beliefs, and perceived importance of global warming issues, either when we controlled for these prior measures or when we did not.

The experimental task and questionnaire were completed in a lab setting creating a realistic environment for viewing website disclosures and allowing individuals to complete the experiment on their own time in a natural context (Bryant, Hunton and Stone, 2004). The experimental task first consisted of answering a series of questions about opinions, knowledge and concern levels on various social issues (homelessness, racism, fair trade, and global warming). To disguise the purpose of the experiment, participants were told that the purpose of the research was a marketing experiment about effective website design for social issues. Participants were told they would be randomly assigned to view a website related to one of these social issues. The next step was to visit a given website and read some information related to global warming issues contained within the various links of the assigned website. These websites were designed expressly for the experiment and were based on an extensive review of real-world grassroots and astroturf websites relative to the types of global warming-related information commonly provided by these two types of websites. This provided a high level of internal validity, while keeping the task externally valid as well. There were eight versions of the websites reflecting the eight treatment conditions, in which both the type of organization (astroturf or grassroots) and the funding source (no funding information, “Funded from donations by people like you”, “Funded by ExxonMobil”, or “Funded by grants from the Conservation Heritage Fund”) were manipulated. Other than the content of the messages and the funding source information, the substance of the websites was identical. In other words, website design, structure and length were the same across all eight conditions, and only the *information content* was manipulated. This provides the optimal setting in which we were able to isolate and measure the effects of the treatment variables.

The website for each condition respectively consisted of a “Home page” with links to five other pages pertaining to global warming and the organization’s activities. In the grassroots condition, these were labeled as “About us,” “Key issues and solutions,” “Why act now?,” “Get involved!,” and “Contact us.” Similarly, in the astroturf condition, the pages links were labeled as “About us,” “Myths/facts,” “Climate science,” “Scientific references,” and “Contact us.” All of the content was based on information found on real-world on grassroots and astroturf websites. This design allowed us to create a situation that is realistic across all treatment groups and also created a high level of control over the experiment.

A further manipulation consisted of disclosing information regarding the funding source that supported the organization. The organization’s name in all websites regardless of condition was “Climate Clarity.” In each of the funding source conditions, all web pages within the condition specified who funds the organization (donations, Exxon Mobil or the Conservation Heritage Fund). The ‘no disclosure’ condition did not have any information on funding sources anywhere within the web pages.

3.2 Experimental Procedures and Measurement of Variables

Participants were randomly assigned to one of the eight conditions and asked to type their assigned website’s Uniform Resource Locator (URL). Prior to viewing a corresponding website, participants were first asked questions to established their level of general uncertainty as a control measure (Lind and Van den Bos, 2002). (“There is a lot of uncertainty in the world right now,” “Many things seem unsettled in the world currently,” and “I cannot predict how things will go in the world in the future” on seven-point scales anchored at 1 = “strongly disagree,” 2 = “moderately disagree,” 3 = “slightly

disagree,” 4 = “neither,” 5 = “slightly agree,” 6 = “moderately agree,” and 7 = “strongly agree”), as well as their knowledge and concern about four different social issues (noted above). Their personal involvement in the global warming issues, of particular relevance to our study context, was embedded here using these two measures, such as “To what extent do you know about global warming issues?” and “To what extent are you concerned about global warming issues?” both anchored at “1” = “not at all,” “4” = “somewhat,” and “7” = “very much.” Next, the participants were introduced to the first screen containing the home page of the participant’s assigned website. Participants were encouraged to spend sufficient time browsing so that they would be able to answer questions about the website’s content. After reviewing the website, participants continued with the questionnaire, by responding to a series of multi-item measures of respondents’ uncertainty towards the global warming issue (“There is a lot of uncertainty about whether or not humans are causing global warming,” “The science about global warming seems quite unsettled currently,” and “Scientists cannot accurately state whether or not humans are causing global warming,” as well as their beliefs regarding the argument that humans are causing global warming (1 = “inappropriate,” “incorrect,” “scientifically unproven,” “inaccurate,” and 7 = “appropriate,” “correct,” “scientifically proven,” “accurate”). Participants also provided opinions on their perceived importance of the global warming issues (“Global warming is not a serious issue that should cause concern” and “The impacts of global warming are so minimal that no policy or legislative response is required” on seven-point scales) and credibility of information from the website (“I think the information in the website is credible,” “I think the information in the website is exaggerated,” “I think the information in this website is not believable,”

and “I believe the claims in the website,” on seven-point scales). Next, participants were asked about their opinions concerning the actual website and organization themselves. In particular, the degree of trust toward the organization and the functionality of the website, modified from McKnight, Choudhury and Kacmar (2002) were also measured. Finally, after completing several demographic questions and manipulation check measures, participants were thanked and dismissed.

Participants in the control condition ($n = 73$) did not view any website and merely responded to three items regarding the global warming issue, such as uncertainty about the cause, perceived importance of global warming issues, and beliefs as to whether human beings are responsible or not.

4. Results

4.1 Confound Assessments

Prior to our main analysis, a 2 (Organization Type) \times 4 (Funding Source) analysis of variance (ANOVA) was performed on the participants’ general perceptions regarding uncertainty of the world and the extent to which they were aware of and concerned about several social issues, including global warming issues, to detect whether differences in these variables might confound changes in uncertainty levels about the causes of global warming or beliefs about human responsibility for global warming, after exposure to messages from an astroturf organization. The analysis revealed no significant differences for general uncertainty level, their perceived knowledge, or concern about global warming issues across all experimental conditions (p -values $> .10$).

We also checked the possibility of differential subjective experience that participants had while viewing a respective website. To address this issue, the respondents' scores from the perceived web functionality were entered into a 2×2 ANOVA, which yielded neither main effects nor an interaction effect (p -values $> .31$). Given the absence of any effect on this measure and the fact that the website was simple to navigate and worked well technically (all M s > 5.00), we could be assured that any effects we would observe would not be attributed to any web functionality factor.

4.2 Hypotheses Testing

Results from a 2 (Organization Type) \times 4 (Funding Source) ANOVA on key dependent measures (uncertainty and legitimacy of the argument that human beings are responsible for global warming) yielded a main effect of funding information. Specifically, there were no significant effects involving the funding source factor, neither main effects nor interactions (p -values $> .10$). Disclosing the funding source of an organization did not affect participants' perceptions of the dependent variables. Thus we found no support for H_3 . For the remaining analyses, we pooled the data for different levels of funding information and added participants in the control condition as a standard comparison, yielding a one-way design with three levels (i.e., astroturf vs. grassroots vs. control).

Next, we assessed whether viewing the messages from astroturf organization websites had an impact on participants' uncertainty levels about the causes of global warming ($\alpha = .81$). The one-way ANOVA run on uncertainty yielded a significant effect ($F(2, 275) = 20.54, p < .001$). Analyses involving contrasts showed that participants who

viewed information from astroturf organizations were more likely to find science about global warming to be uncertain relative to those who had viewed information from grassroots organizations ($M_{\text{astroturf}} = 4.38 > M_{\text{grassroots}} = 3.33, p < .001$) or those in the control condition ($M_{\text{astroturf}} = 4.38 > M_{\text{control}} = 3.21, p < .001$). Thus, H_1 is supported in that astroturfing websites significantly weakened people's certainty about the cause of global warming.

Exposure to information from astroturf organizations also influenced beliefs as to whether human beings are causing global warming, which provides support for H_2 . Specifically, as indicated by the ANOVA performed on this belief measure ($\alpha = .92; F(2, 275) = 16.47, p < .001$), individuals who viewed information from astroturf organizations were significantly less likely to believe that global warming was caused by human beings than individuals who viewed information from grassroots organizations ($M_{\text{astroturf}} = 4.48 < M_{\text{grassroots}} = 5.33, p < .001$). Significance was also observed in the comparison to people in the control group ($M_{\text{astroturf}} = 4.48 < M_{\text{control}} = 5.366, p < .001$). Taken together, these results indicate that, after viewing astroturf organization websites, people's attitudes toward the human responsibility argument tend to decrease in terms of magnitude (i.e., beliefs), as well as in strength (i.e., certainty) and support both H_1 and H_2 .

In addition, exposure to information from astroturfing versus grassroots organizations appeared to have an impact on the perceived importance of the issue itself, as well ($F(2, 275) = 4.36, p < .05$), in that people who viewed information from a

grassroots vs. astroturf organization perceived the global warming issue as more important ($M_{\text{grassroots}} = 6.42 > M_{\text{astroturf}} = 6.01, p < .01$)⁷.

Table 3 presents descriptive statistics of the above-mentioned variables, as well as other measured items, such as credibility of the information and trust toward the organization. Interestingly, participants who browsed a website from an astroturf organization found the information as less credible and the organization as less trustworthy, compared to those who browsed a website from a grassroots organization. Despite such a correct assessment of the message and the target, however, participants' uncertainty and beliefs about global warming were still significantly affected., as astroturf organizations had intended to instill confusion and uncertainty to the general public regarding the global warming issue. This stark contrast (i.e., not trusting, but still being persuaded) may indicate the power of mere exposure to astroturfing messages.

----- Table 3 about here -----

4.3 Additional Analysis

To further shed light on these effects after viewing information from astroturf versus grassroots organizations, we investigated whether a certain group of people would be more or less likely to be influenced by such information. Specifically, in order to examine the possibility that astroturfing messages might be particularly potent among people who are less involved in the global warming issue, we performed two additional tests on : 1) the moderating role of issue involvement; and 2) the differential reliance on website information in forming their judgments. For the first task, we performed a

⁷ However, the comparison between people who viewed information from an astroturf organization and people who did not view any website was only directional ($M_{\text{astroturf}} = 6.01$ vs. $M_{\text{control}} = 6.12, p > .49$).

regression on key dependent measures with organization type (dummy coded as 0 = grassroots and 1 = astroturf), mean-centered issue involvement levels, and their interactions as predictors, which did not generate any significant interaction effect.

For the second test, in which we compared the beta coefficients (i.e., weight) of organization type across groups with either high or low expertise on the global warming issue.⁸ Following the procedure suggested by Gujarati (1970; 2003),⁹ we observed that in terms of beliefs about human cause, individuals who were not highly involved in the issue were more influenced by exposure to the astroturfing messages, relative to individuals who were highly involved in the issue. In other words, people with a low level of involvement in the issue tended to question the human cause argument to a greater degree, compared to people with a high level of involvement. These results echo the notion that individuals who are less (vs. more) aware of or concerned about the global warming issue appear to utilize the information from astroturf organizations to a greater degree, as the beta coefficient difference (i.e., weight) indicates, resulting in trivializing the generally accepted argument as to human beings' direct responsibility for the issue.

⁸ To create two groups in expertise, we employed a median split (median = 5.00) on the average of two involvement items (i.e., “to what extent do you know about global warming issues?” and “to what extent are you concerned about global warming issues?”, on seven-point scales) and identified low- and high-involvement groups.

⁹ In order to test for statistically significant differences across two groups, we combined the two equations into one using dummy coding:

$$\begin{aligned} \text{Beliefs} &= \beta_0 + \beta_1 \times D + \beta_2 \text{OrganizationType} + \beta_3 \text{OrganizationType} \times D + \varepsilon \\ D &= 1 \text{ (if a high level of involvement)} \\ &= 0 \text{ (if a low level of involvement)} \end{aligned}$$

In terms of interpretation, we can conclude that the impact of organization type (either astroturf or grassroots) for a low-expertise/concern group (β_2) is not the same as that for a high-expertise/concern group ($\beta_2 + \beta_3$) if β_3 is significantly different from zero. That is, β_3 indicates the differential weight of organization type on beliefs for the high versus low group. In our analysis, we found β_3 to be significantly smaller than zero ($\beta_3 = -1.16; p < .01$) and β_3 to be significantly greater than zero ($\beta_3 = .67; p < .05$). These results indicate that the influence of exposure to the information from astroturf websites is greater among people with low versus high issue involvement.

5. Discussion, conclusion and implications

The purpose of our study was to determine whether information from astroturf organizations affects people's trust and certainty levels, in terms of their existence and their messages about global warming and whether these messages actually affect/change their beliefs about its causes (human vs. nature). A surprising result was the lack of support for the moderating effect of funding source disclosure. We expected that participants who viewed denialism information on a website that claimed to be funded by ExxonMobil would be less trustful of the information and thus the information would not affect their beliefs about global warming. This group of participants did have lower levels of trust in the website yet their beliefs were still significantly affected by the information. Such lack of support for our expectations may be attributed to the differences in user responsiveness driven by different types of disclosure and impression management tactics (Bansal and Kistruck, 2006) or that some website disclosure features affect trusting intentions but not trusting beliefs (Cho et al., 2009). More importantly, however, our research findings suggest that astroturf organizations are effective in creating the sought uncertainty in the minds of people exposed to their message.

Analysed in light of rhetoric as it applies to the language of legitimacy, our results show that in the clash of competing institutional logics, we showed that astroturf organizations are able to successfully employ carbon-based energy narratives to challenge the emergent institutional logic of global warning narrative used by grassroots organizations. Information from astroturf organizations appears to effectively undermine the certainty about global warming, the beliefs that humans cause global warming and the importance of the phenomenon per se. Our research examines a current social conflict in

which competing interests are challenging each other in a contested terrain (Eisenstadt, 1980; Rao and Singh, 1999). Our results support the idea that rhetorical strategies used within broad narratives (Hartelius and Browning, 2008) can be manipulated by actors as they defend established logics (Suddaby and Greenwood, 2005) by challenging an emergent and contradictory logic.

Our research provides an empirical test of Suddaby and Greenwood's (2005) argument that rhetoric can be used to emphasize contradictions in emergent logics by manipulating uncertainty. A counter-intuitive result comes from our finding that uncertainty about the cause of global warming increases even when participants distrusted the source of information. This builds on Sitkin and George's (2005) argument that we are able to act because we trust broader social institutional logic because our uncertainty about the world is reduced. Our research results suggest that we may be less likely to follow an emergent logic when we are more uncertain about the effect of our actions. Increasing uncertainty in an emergent logic destabilizes the logic because we are unsure of the appropriateness of the actions dictated by the new logic.

Like all empirical studies, our investigation is subject to certain limitations. Our research design focused on a high level of internal validity with preset organization type conditions, information/messages, and funding sources, which required certain tradeoffs with external validity. However, because the structure and content of the websites designed for use in our study were based on information found on actual grassroots and astroturf websites, we believe our study's external validity is strengthened. In addition, participants in our experiment were university undergraduate students. While we believe these sample members were appropriate subjects for this investigation given their

substantial web reliance, we concede that they may not be representative of the general public. However, many researchers have found that student samples are appropriate as long as the task is matched to their familiarity level and abilities (e.g., McKnight et al., 2002). In this aspect, we believe that using a student sample was appropriate for this particular task (see Cho, Phillips, Hageman and Patten, 2009).

Limitations aside, these findings not only indicate that corporations are successful in fostering their own interests through astroturfing, but also imply that this corporate political activity is detrimental to grassroots organizations. The uncertainty created by astroturfing is likely to reduce people's desire to participate in legitimate grassroots movements and to support them financially. People being the core of grassroots organizations (Gundelach, 1979), astroturf organizations represent a serious threat to these movements. In short, by using astroturf organizations, corporations both strengthen their business interests and weaken their business opponents.

From an environmental perspective, astroturfing global warming goes against the ethics of environmental protection (Jeurissen and Keijzers, 2004; Hoffman, 1991). It challenges the ethical arguments advocating for the respect the environment in human activities. More globally, the lack of transparency characteristic of astroturfing organizations poses serious societal ethical concerns (Bodensteiner, 1997). Deception is used to manipulate the public opinion in favour of business interest through the use of fake grassroots organizations. For example, environmental information is employed therein with the purpose to deceive users (Cormier, Gordon and Magnan, 2004). As such, the general public is more likely to be deceived by astroturfing than the

governments due the lack of awareness about these front groups (Bodensteiner, 1997)
and this creates some serious concerns for the well-being of our society.

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Table 1
Hillman and Hitt's (1999) model of corporate political strategy formulation as summarized by Roberts et al. (2003)

Decision One: Approach to Political Strategy		Decision Two: Level of Participation		Decision Three: Strategies and Tactics to be Used		
TRANSACTIONAL (short-term; issue-specific focus)	RELATIONAL (long-term; spans multiple issues)	COLLECTIVE (cooperation of two or more individual firms)	INDIVIDUAL (solitary efforts by individual or firm)	INFORMATIONAL (provide information about preferences and cost/benefit of alternative policies)	FINANCIAL INCENTIVE (align policy-maker and firm interests)	CONSTITUENCY BUILDING (affect policy indirectly through appeals)
<i>Lesser</i> degree of dependence on government policy	<i>Greater</i> degree of dependence on government policy	<i>Less</i> financial and intangible resources (regardless of approach)	<i>More</i> financial and intangible resources (regardless of approach)	Transactional approach and in public policy formulation stage (regardless of level of participation)	Transactional approach and in public policy formulation stage (regardless of level of participation)	Transactional approach and in public opinion formation stage (regardless of level of participation)
<i>More</i> pluralistic society	<i>Less</i> pluralistic society	<i>Less</i> pluralistic society (regardless of approach)	<i>More</i> pluralistic society (regardless of approach)	<i>Greater</i> firm credibility and uses <i>relational</i> approach (regardless of level of participation)		<i>Greater</i> firm credibility and uses <i>relational</i> approach (regardless of level of participation)
<i>More unrelated</i> product diversification	<i>More related</i> product diversification	Election issue using <i>transactional</i> approach				Large employment/membership base
<i>No</i> corporate government relations office	Corporate government relations office	Representative trade association or interest group visible in public policy-making process	Dominant firms visible individually in public policy-making process	Lobby	Contributions	Grassroots efforts
<i>No</i> specialized political knowledge	Specialized political knowledge			Sponsor research projects	Honoraria	Advocacy advertising
<i>No</i> relationships with key policy makers	Relationships with key policy makers			Expert witness	Paid travel	Public relations
				Position papers/technical reports	Hiring people with political experience/running for office	Press conferences
						Political education programs

Table 2
Descriptive data for 278 participants providing usable responses

	Sample
<u>Age</u>	
20 or younger	40.4%
21 – 25	53.1%
26 – 30	3.3%
31 or older	3.2%
<u>Gender</u>	
Male	45.8%
Female	54.2%
<u>Annual Household Income</u>	
Less than \$30,000	25.2%
\$30,000 – \$49,999	12.9%
\$50,000 – \$69,999	13.8%
\$70,000 – \$99,999	14.2%
\$100,000 – \$149,999	16.0%
\$150,000 – \$199,999	7.5%
Greater than \$200,000	9.0%

Table 3
Descriptive statistics for dependent measures

Dependent variable	Grassroots Organization	Astroturf Organization	Control
Uncertainty about global warming	3.33 ^a (1.38)	4.38 ^b (1.27)	3.21 ^a (1.51)
Beliefs about whether humans are causing global warming	5.33 ^a (1.21)	4.48 ^b (1.25)	5.36 ^a (1.17)
Perceived importance of the global warming issue	6.42 ^a (.83)	6.01 ^b (.98)	6.12 ^{ab} (1.29)
Perceived credibility of website Information	5.08 ^a (1.06)	4.60 ^b (1.20)	-
Trusting beliefs toward the organization	4.74 ^a (.97)	4.45 ^b (.98)	-
Certainty of their trusting beliefs toward the organization	4.41 ^a (1.31)	4.22 ^a (1.33)	-
Web functionality	5.55 ^a (.92)	5.42 ^a (1.04)	-
Interest in further information from the organization	3.12 ^a (1.54)	3.45 ^a (1.78)	-

Standard deviations are given in parentheses. For each row, means with different superscripts differ significantly ($p < .05$, t-tests).