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The impact of social norms on entrepreneurial action: Evidence from the environmental entrepreneurship context

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ABSTRACT

Using insights from institutional theory, sociology, and entrepreneurship we develop and test a model of the relationship between centralized and decentralized institutions on entrepreneurial activity. We suggest that both decentralized institutions that are socially determined as well as centralized institutions that are designed by governmental authorities are important in promoting firm foundings in the environmental context. In a sample of the U.S. solar energy sector we find that state-sponsored incentives, environmental consumption norms, and norms of family interdependence are related to new firm entry in this sector. Our findings also suggest that the efficacy of state-level policies in the sponsoring of entrepreneurial growth is dependent upon the social norms that prevail in the entrepreneur's environment. We expand entrepreneurship theory and the study of institutions and the natural environment by demonstrating the integral role that social norms play in influencing the creation of new firms and by illustrating the potential effect social norms have on the effect of policy that seeks to encourage environmentally responsible economic activity.

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1. Executive summary

The study of business and the natural environment continues to gain ground and attention in academic research (Bansal and Roth, 2000; Berrone and Gomez-Mejia, 2009; Delmas et al., 2007). Environmental entrepreneurship has emerged within this stream of research to examine the drivers of environmentally responsible entrepreneurial action and the consequences of such behavior (Anderson and Leal, 2001; Dean and McMullen, 2007; Larson, 2000). While this area of study offers a fascinating perspective on the nature of entrepreneurial opportunities for environmental goods and services, it has mostly adopted an economic approach (Dean and McMullen, 2007; Cohen and Winn, 2007). This study offers one of the first empirical studies of the sociological component of environmental entrepreneurship by offering social norms, defined as unwritten rules of conduct in a group (Elster, 1989), as a factor which influences engagement in environmental entrepreneurship.

Integrating theory from entrepreneurship, sociology, and institutional theory, we argue that both centralized (government designed) and decentralized (socially determined) institutions impact entrepreneurial activity. Specifically, we suggest that (1) state-sponsored incentives; (2) environmental consumption norms; (3) norms of conformity; and (4) norms of family interdependence influence firm foundings in the environmental context. Using a unique dataset on solar energy firm foundings

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and the General Social Survey (GSS) we empirically demonstrate that social norms, by themselves and in conjunction with state-level incentives, have the ability to influence environmental entrepreneurship. Specifically, our analysis finds that state-level incentives, environmental consumption norms, and norms of family interdependence are related to the formation of solar energy firms, and that conformity and family interdependence norms influence the effect of state policies on firm foundations.

Our findings have implications for theory and practice. For researchers, the results of this study provide some of the first empirical evidence that social norms explain some of the variation in the level of entrepreneurial foundations in a given region. Thus, future entrepreneurship research would be well served to consider the potential explanatory power that social norms play. In addition, and perhaps of greater theoretical interest, is our contention that while centralized government incentives may contribute to entrepreneurial growth and economic development, such effect is dependent on the overall social environment and its influence on entrepreneurial decision-making. This is particularly relevant, although not exclusive, to the context of the natural environment where social norms and the values that they espouse likely serve as an important motivation in the exploitation of entrepreneurial opportunities.

For entrepreneurs and investors, the findings point to the potential importance of location decisions. While some research on founding rates suggest that the regulatory environment (Rao, 2004), political leanings (Hiatt et al., *Forthcoming*) and institutions (Russo, 2001) play a crucial role, locating environmentally conscious new businesses in areas with high levels of environmentally responsible consumption and family interdependence norms may also be important. In addition, our results provide insights to policymakers. This study suggests that government-sponsored incentives are more effective at promoting new firm foundations in the solar energy sector when surrounded by family interdependence norms; but that this relationship is weakened by the increased presence of norms of conformity.

The paper begins with a review of the emerging literature on environmental entrepreneurship. Next, we provide the background and theoretical rationale for why social norms may impact firm founding rates of environmentally responsible ventures. Finally, we present the empirical results and end with a discussion of the study's limitations, implications, and conclusions.

2. Introduction

The past decades have witnessed a growing interest and attention to the role of business in driving sustainability in general (Bansal and Roth, 2000; Hart, 1995; Porter and van der Linde, 1995; Shrivastava, 1995), and to the ability of entrepreneurs to promote environmental welfare in particular (Anderson and Leal, 2001; Dean and McMullen, 2007; Larson, 2000). This interest has brought with it the emergence of a variety of academic and popular areas of research—including the subject of “eco-preneurship” (Bennett, 1991; Blue, 1990; Kivirist and Ivanko, 2008) and environmental entrepreneurship (Anderson and Huggins, 2008; Cohen and Winn, 2007; Dean and McMullen, 2007)—which address the pursuance of opportunities for profit that simultaneously deliver environmental benefits. Within this research, the concept of environmental entrepreneurship was introduced and defined as “the process of discovering, evaluating, and exploiting economic opportunities that are present in environmentally relevant market failures” (Dean and McMullen, 2007; 58). This conceptualization points to the important role of entrepreneurs in mitigating market failures and promoting social welfare through the exploitation of environmentally responsible opportunities. To date, this perspective offers a foundation for explaining environmental entrepreneurship primarily from an economic lens. Yet we know little about how social dimensions such as social norms can further explain the emergence of entrepreneurship, and specifically, environmental entrepreneurship.

In this study, we use the concept of social norms, defined as unwritten rules of conduct of a group (Elster, 1989), as a way to study how private, decentralized institutions (Ingram and Silverman, 2002) impact the creation of environmentally responsible new ventures. Social norms could shed light on how group-level values impact the individual-level decision-making of entrepreneurs. In addition, we study how social norms influence the ability of state-sponsored centralized institutions to foster or inhibit entrepreneurial action by means of firm foundations. In conducting this research we make several contributions. First, we apply the concept of social norms to the study of entrepreneurship, its relationship with centralized government institutions, and the implications of such on entrepreneurial activity. Second, we enhance and expand the emerging literature in environmental entrepreneurship by identifying and empirically examining the role of specific social norms that explain the emergence of environmentally responsible firms. While work in environmental entrepreneurship has addressed the impact of social *movements* in environmentally responsible firm foundations (Sine and Lee, 2009), this literature has been mostly concentrated on the economic factors that drive entrepreneurial action towards environmental welfare (Anderson and Leal, 2001; Cohen and Winn, 2007; Dean and McMullen, 2007).

Third, we raise important implications for the study of institutions and the natural environment (Anderson and Leal, 1992; Atkinson and Tietenberg, 1991; Dorfman and Dorfman, 1993; Ostrom, 1990). While research in institutions recognizes both the usefulness of government intervention (Atkinson and Tietenberg, 1991; Bator, 1958; Dorfman and Dorfman, 1993) as well as socially determined institutions for the encouragement of environmentally responsible behavior (Ostrom, 1990; Osés-Eraso and Viladrich-Grau, 2007), we know little about the co-dependencies across these different types of institutions and their collective effect on environmental outcomes. Our approach helps to address this gap by concurrently examining how these different types of institutions influence environmentally relevant economic activity.

In the following section we develop our theoretical motivation. We briefly describe the context of environmental entrepreneurship. We then review the literature on the impact of public, centralized institutions (Ingram and Silverman, 2002) on entrepreneurial action and advance hypotheses regarding the impact of these institutions on environmental entrepreneurship.

The literature on social norms is then reviewed. From this basis, we develop and test a model predicting firm foundings in environmental ventures based on the interaction of public, centralized institutions (state-level incentives) with private, decentralized institutions (social norms). We conclude with a discussion of our results and suggestions for future research.

3. Theoretical development

3.1. The environmental entrepreneurship context

Research on the subject of entrepreneurship and the natural environment has primarily used an economic lens to explain the emergence of entrepreneurial opportunities (Anderson and Leal, 2001; Anderson and Huggins, 2008; Cohen and Winn, 2007; Dean and McMullen, 2007; Larson, 2000). For instance, building on the logic of environmental economics, Dean and McMullen (2007) build a theory of environmental entrepreneurship that suggests that market failures such as public goods and externalities serve as a source of entrepreneurial opportunity. Similarly, Cohen and Winn (2007) focus on market imperfections, firm inefficiencies, and flawed pricing mechanisms as opportunities for entrepreneurs to engage in market correction towards environmental welfare in an act of creative destruction (Hart and Milstein, 1999).

While these theoretical contributions provide a useful framing of environmental entrepreneurship from an economic perspective, they provide little understanding of how the institutional context will impact the decision by an environmental entrepreneur to exploit a given opportunity. Recent work has pointed out that to achieve a richer understanding of entrepreneurial activities, we must not only examine the actors involved, but also “their relation to the wider meaning systems and theories embedded in cultural elements such as categories, conventions and discourse” (Lounsbury and Crumley, 2007).

Because environmental entrepreneurship inherently addresses an area rife with normative (Freeman and Werhane, 2000; Freeman et al., 2008; York, 2008) as well as regulatory (Dorfman and Dorfman, 1993; Hawken, 1995; Hart and Milstein, 2003; Porter and Kramer, 2006) implications, it offers a well-suited context for theorizing on the impact of public, centralized (governmental) and private, decentralized (cultural) institutions on firm foundings (Ingram and Silverman, 2002). In the following sections we develop hypotheses regarding the impact of both state-driven incentives and social norms on firm foundings in environmental ventures.

3.2. Institutions and entrepreneurship

Institutions are the “rules of the game” for organizations; the institutional framework dictates the incentives that determine which skills and knowledge will result in the maximum payoff (North, 2005). Institutions can be broadly characterized as either 1) public, centralized institutions, or 2) private, decentralized institutions (Ingram and Silverman, 2002). Public institutions include laws, regulations and tax codes while private institutions include societal norms, cultural norms, expectations and beliefs. Both types of institutions are particularly impactful for entrepreneurial ventures, as they suffer from the liability of newness (Stinchcombe, 1965) and must struggle against existing institutional arrangements (Aldrich and Fiol, 1994; Scott, 1995). Because new ventures offer products and services which have not received the endorsement and legitimacy (Suchman, 1995) of extant firms, they must work to achieve acceptance and adoption.

The impact of institutions on new firm entry has received a great deal of study. The broad conclusion of this literature is that firm foundings are impacted by the economic and political context in which the potential entrepreneur is found (Shane, 2004). The relationship between the economic environment and entrepreneurial activity is relatively well understood and intuitive; economic stability (Harper, 1998; McMillan and Woodruff, 2002), capital availability (de Bettignies and Brander, 2007; Shane, 1996) and reduced personal income taxes (Gentry and Hubbard, 2000) are all positively associated with the rate of firm foundings. However, our understanding of the interaction between political, public institutions and social, private institutions is much less clear. An area which has received even less attention is the impact of institutions in determining the direction of entrepreneurship towards the creation of social wealth (Baumol, 1990; Sobel, 2008; Venkataraman, 1997).

In the following sections we review the current literature on the impact of governmental incentives and social norms on entrepreneurship. We then extend this theory to develop hypotheses about how public, centralized and private, decentralized, institutions will interact to predict founding rates for ventures which create both economic and environmental benefits.

3.2.1. Public, centralized incentives and environmental entrepreneurship

Studies of institutions have long focused on the role of public, centralized institutions, defined as state-driven laws, regulations, and incentives in fostering innovation and creation of new industries (Ingram and Silverman, 2002). The regulatory environment is the direct result of the state’s selection and enforcement of acceptable or preferred practices. At a foundational level, the state can act to facilitate exchange through providing a basic legal system that decreases transaction costs by allowing individuals to engage in credible commitments (Olson, 2000). There is empirical evidence from a wide range of settings that established legal systems can increase the overall likelihood of entrepreneurial success (for a review see Ingram and Silverman, 2002). Of particular importance is the establishment of enforceable property rights for the exploitation of entrepreneurial opportunities (Anderson and Leal, 2001; de Soto, 2000).

Public institutions provided by the state can also directly influence the direction of industrial sectors through providing incentives, such as tax breaks, to encourage the creation of entrepreneurial ventures (Audretsch et al., 2007). These types of efforts are selective, and aim to promote particular sectors or practices over others.

Tax incentives have been applied to a wide range of industries to encourage research and development (Scotchmer, 2006) as well as firm foundings (Giannetti and Simonov, 2004). This has certainly been the case in many areas of environmental entrepreneurship, including renewable energy such as wind, solar or geothermal energy (ACORE, 2007a, b) and green building (Yudelson Associates, 2007). There is anecdotal evidence that these incentives have had an impact; for example the passing, and subsequent expiration and renewal of the federal Renewable Electricity Production Tax Credit (PTC) has been shown to highly correlate with overall production of renewable energy in the U.S. (Pernick and Wilder, 2007). Therefore, it is logical to assume that public, centralized institutions which support the adoption of environmentally responsible products, industries and services will be a factor in determining levels of environmental entrepreneurship:

Hypothesis 1. States with higher levels of incentives will also have a higher number of environmentally responsible new firm foundings.

While the role of public institutions has received a great deal of attention, we know far less about the relationship between decentralized institutions, such as social norms, and entrepreneurial action.

3.3. Social norms

Social norms, defined as unwritten rules of conduct within a group (Elster, 1989), indirectly specify desired behaviors and the accompanying sanctions for not following these behaviors in a given community (Kandori, 1992). For a norm to be defined as a social norm, it must be a) shared by others and b) sustained by their approval (Elster, 1989). Norms are maintained by the unwanted emotions (guilt, embarrassment, shame) an individual feels when not complying with them. Individuals' strong need to belong to social groups and be accepted by them (Baumeister and Leary, 1995) makes heeding social norms particularly important. The classic decision-making guide "don't do it if you wouldn't want it on the front page of the newspaper" provides a simple way to understand social norms. On the contrary, other types of norms, such as legal regulations, are "enforced by specialists who do so out of self-interest: they will lose their job if they don't. Social norms are enforced by members of the general community, and not always out of self-interest" (Elster, 1989, 100).

Cultures (and groups) often differ on the extent of sanctions placed on individuals that violate normative behavior (Packer, 2008). If the sanctions or punishments of violating a social norm in a given community are strong enough, few people will want to violate them (Kandori, 1992). Thus, "the behavior of other citizens is important to understand why people comply" (Torgler and Garcia-Valinas, 2007; 3). Violation of social norms often leads to negative consequences such as internal sanctions (e.g., guilt, remorse) or external social sanctions, such as gossip and ostracism.

Scholars suggest that the majority of individuals in a societal group believe in the norms held by the group. Certain norms may be perceived as annoying, unproductive, harmful or immoral by some group members (Iyer et al., 2007). However, even if a group member rejects some norms, they are still likely to conform to most group norms (Packer, 2008). Rejection of a norm does not mean that social norms don't drive compliance. Some individuals may reject a norm simply because they have already accepted a competing norm from an existing group (Biddle, 1986; Merton, 1968; Sherif and Sherif, 1967; Warren, 2003; Willis, 1965).

Social norms have been associated with economic perspectives in addition to sociological perspectives. Kenneth Arrow (1971) calls attention to norms of social behavior and suggests that they might be society's way of reacting to and compensating for market failures. Although a sense of trust can be purchased in the marketplace, it is difficult and costly; internalizing social norms represents an alternative way of dealing with uncertainty (Arrow, 1971). The lack of market trust present in such a market failure makes trust in individuals, as opposed to institutions, more important. Other economists, such as Kandori (1992) use social norms and community sanctions to explain behaviors of different agents in ongoing relationships. This integration of economic and social perspectives makes social norms a valuable variable in bridging our understanding of how entrepreneurial action is impacted by social and economic factors as discussed in the following section.

3.4. Social norms and entrepreneurship

Social norms have rarely been empirically tested in the entrepreneurship literature. Krueger et al.'s (2000) study of intention-based models of entrepreneurship tested for the effect of perceived social norms on entrepreneurial intentions, however, they found no evidence of such a relationship. Giannetti and Simonov's (2004) study found evidence that social norms did have some impact on entrepreneurial entry in Sweden. The findings from these studies are mixed, but may be analogous to similar research that suggests cultural values and beliefs do have an ability to impact (over and above structural factors) the explanatory power of group guidelines on new firm formation (e.g., Davidsson, 1995; Davidsson and Wiklund, 1997)⁴. Values can be held by both individuals and collectives (Kilby, 1993; Kluckhohn, 1951). Social norms are present at a group level, suggesting that a collective believes a certain value is very important (Lipset, 2000). Such collective agreement can be assessed at the country level. For

⁴ It is important to understand the difference between social norms and culture. Social norms are one part of a country's or group's culture, but should not be considered as a proxy for culture as a whole or as a substitute for other cultural dimension measures (Elster, 1989). However, since social norms represent one component of culture, it may be necessary to examine the cultural context when evaluating social norms. Culture can be examined from multiple levels of analysis from the macro level (e.g., country level, gender, ethnic group) to the micro level (e.g., a company, neighborhood, or family) (Morris and Schindehutte, 2005, 455).

example, some of the existing literature on cultural differences in entrepreneurship suggests that entrepreneurs from different countries are more alike than non-entrepreneurs from the same country (McGrath and MacMillan, 1992). Many researchers have implicitly assumed that individuals choosing self-employment represent a homogenous group (Blanchflower and Meyer, 1994). Yet, other studies suggest the attributes of entrepreneurs differ drastically across cultures and countries (Thomas and Mueller, 2000).

If social norms differ across entrepreneurs by means of different value systems, and social norms are influential in individuals' views of the natural environment, then social norms are likely to influence the motivation and therefore, the likelihood, of entrepreneurship in the environmental context. We explore this in the following section.

3.5. Social norms and environmental entrepreneurship

It is clear that social norms regarding the natural environment exist and are linked to the broader social norms outlined earlier (Hawken et al., 1999). Environmental problems that may cause the development of social norms include, but are not limited to, human-induced climate change, ozone decline, nuclear radiation, industrial toxins and widespread air and water pollution (Shrivastava, 2000; United Nations, 1999, 2004). While it is true that many of these same environmental problems have been addressed with formal laws and regulation, much of the literature on social norms (and this study) attempts to point out the role that social norms play as a substitute or supplement to formal laws (Polinsky and Shavell, 2000).

Environmental awareness has increased at every level of society in recent years and climate change, in particular, has received a great deal of media and governmental attention (IPCC, 2007; Kluger, 2006). Empirical research has demonstrated the efficacy of social norms in changing the behavior of individuals regarding the natural environment (Cialdini, 2003; Ostrom, 2000) and economic actions (Young, 1998). Individuals are influenced in their economic choices by both injunctive norms (which involve the perception of the right thing to do) and descriptive norms (which involve the description of others' behavior) (Cialdini, 2007). For entrepreneurs, the injunctive norm may guide them to embrace opportunities which are deemed legitimate (Suchman, 1995) by their social groups, while descriptive norms may help them identify trends upon which they can capitalize. Such is the case in the realm of social norms regarding the natural environment, as the inherent normative message of the environmental movement has recently entwined with the pop culture driven trend of "going green."

In the following sections we develop hypotheses on how specific social norms will impact the firm findings of environmental ventures. These specific types of social norms include: consumption norms, norms of conformity, and norms of support, specifically family interdependence (Elster, 1989).

3.5.1. Consumption norms and environmental entrepreneurship

Consumption norms have typically regulated such things as clothing and dress styles and appropriate manners expected in social settings such as dinner table etiquette (Elster, 1989). However, Bourdieu (1979) took the notion of consumption norms and expanded it to include many other cultural behaviors such as the vocabulary, dialect and pronunciation people adopt, what people watch on the television or at the theater, which books people read, which sports they play, and what type of furniture they buy.

Consumption norms have important implications for environmental entrepreneurs. For instance, if consumption norms have an impact on the furniture people buy, as Bourdieu suggests, they are also likely to have an impact on many other goods and services that people buy. Consumption norms could determine whether or not consumers find value in buying, consuming, and endorsing products and services from businesses that operate in environmentally sound ways. With consumption norms taken into consideration, the desirability and acceptability of creating environmentally responsible new ventures likely varies across groups.

Consumptive norms will also impact the nature of the products which are preferred. For example, consumptive norms in the U.S. in the 1990s favored safety and convenience in automobile purchases above fuel efficiency, thus leading to the massive sales of sport utility vehicles. However, as events such as the war in the Persian Gulf, Hurricane Katrina and China's growing demand for oil helped escalate the price of petroleum, the hybrid car began to appeal to a wider segment of global buyers. Rising public anxiety about climate change, local air pollution, and concern about dependence on foreign sources of oil combined to shift social norms in the U.S. towards the favoring of fuel efficient vehicles. While existing firms such as Toyota have seized on this shift in norms, it has also created an opportunity for a slew of new firms (16 as of 2007) to compete in the electric car realm (Kannelos, 2007). Social norms regarding the appropriateness of consuming resources are likely to have a direct impact on the ability for environmental entrepreneurs to come to market with new innovations. This leads us to the following hypothesis:

Hypothesis 2a. States with higher levels of environmentally responsible consumption social norms will also have a higher number of environmentally responsible new firm findings.

Policies designed to encourage the adoption of environmentally responsible products and practices typically work according to two mechanisms: 1) they attempt to influence supply levels by requiring industries to comply with producing a percentage of their goods and services using environmentally superior methods (such as the Renewable Portfolio Standards reviewed above) or 2) they seek to create demand for a product by subsidizing it (such as tax incentives for the installation of solar panels in a private residence). We argue that each of these mechanisms will be more effective when implemented in a region with strong social norms of responsible environmental consumption.

For example, the Energy Act of 2005 provided a tax credit for U.S. citizens who purchased hybrid cars. While the tax incentive provides some minimal motivation, changing attitudes around fuel efficiency, human-induced climate change and energy

independence (Yale Center for Environmental Law and Policy, 2007) have all fostered a social norm in the U.S. that regards the use of large and inefficient vehicles as irresponsible behavior, thus reinforcing the efficacy of the tax credit. It is logical to assume that sales of hybrid cars have steadily risen in the U.S. from 0.5% of U.S. car sales in 2005 to 2.6% (312,000 vehicles) in 2008 (Gravigny, 2009), not only due to the tax incentive, but also because of evolving attitudes and their enforcement through informal social norms. This is not to say that policies have no effect without the support of norms, but rather, we argue that social norms can act to inhibit, or increase the effect of policies.

New products and services, as well as new firms, struggle to gain legitimacy in the eyes of the market (Aldrich and Fiol, 1994; Stinchcombe, 1965). Public, state-sponsored incentives provide regulative legitimacy and reduce risk of adoption for consumers and risk of creation for entrepreneurs by providing financial incentives. Environmental consumption norms will lend normative legitimacy to government policies (Scott, 1995) enforcing the appearance that environmentally beneficial practices are not only economically beneficial, but they are also the *right thing to do* in the eyes of our neighbors, friends and family. Thus, these norms will have an amplifying impact on the efficacy of policy. Accordingly, we hypothesize:

Hypothesis 2b. State-level incentives will have an increased positive effect on the number of environmentally responsible new firm foundings in states with higher levels of environmentally responsible consumption social norms.

3.5.2. Norms of conformity and environmental entrepreneurship

Developing environmentally responsible products and services may be less desirable for nascent entrepreneurs in certain groups (regions) whose members value conformity. In this study, conformity refers to the motivation of individuals to act according to society's rules. Conformity may be particularly poignant in an environmental entrepreneurship context because it often leads to sub-optimal decision-making and group-think (Janis, 1972). Given the longstanding tradition of entrepreneurial activity focused exclusively on economic profits, regardless of the environmental implications (Pigou, 1932), conformity may lead to fewer environmentally sustainable new venture ideas and start-ups. In contrast, nonconformity has been shown to enhance creativity and innovation and increase the quality of decision-making within a group (De Dreu, 2002; De Dreu and West, 2001; Kelley and Shapiro, 1954). Most cultures that embrace a certain amount of nonconformity will likely set limits to how much nonconformance is acceptable (Blanton and Christie, 2003).

If conformity refers to the motivation of individuals to act according to society's rules, it can also be used to examine the founding rate of environmental start-ups. Since conformity has been shown to constrain creativity and innovation, and these are the building blocks of entrepreneurship, we theorize that conformity will act to suppress entrepreneurship in a region. As environmental entrepreneurship is less frequent, and may be perceived as on the "fringe" to highly conforming societies, we argue that this repressive effect of conformity on entrepreneurship will be even higher for the entry of firms addressing environmental challenges. The impact of high-conformity norms would also reduce the efficacy of state policy which seeks to encourage environmental entrepreneurship, because these policies are often enacted to counteract the prevailing norm of disregarding environmental degradation. Thus, if high-conformity norms are in place, incentives are unlikely to encourage potential environmental entrepreneurs to break with social norms and create businesses that do not fit with the prevalent conception of entrepreneurship as a purely economically motivated activity. This leads us to the following hypotheses:

Hypothesis 3a. States with higher levels of conformity social norms will also have a lower number of environmentally responsible new firm foundings.

Hypothesis 3b. State-level incentives will have a reduced positive effect on the number of environmentally responsible new firm foundings in states with higher levels of conformity social norms.

3.5.3. Norms of family interdependence and environmental entrepreneurship

Norms of support have been examined in previous entrepreneurship research (Kolvereid, 1997) but have been somewhat limited in scope to the supportiveness of friends, family, and role models. The perception of a supportive environment seems to be an important organizational culture factor in highly entrepreneurial companies. Jelinek and Litterer (1995) discovered that a highly entrepreneurial organization need not have a high number of entrepreneurial employees to be effective; corporate entrepreneurs often seek "buy-in" from other key members of the company as they may need access to resources held by other power holders in the organization. To create and maintain this environment, an entrepreneurship-friendly setting that employees and managers perceive as truly supportive is needed (Krueger, 2003).

Just as highly entrepreneurial organizations need to exude a perception of support, it is likely that the perceived social norms of a region (i.e. country, state or city) or group (i.e. family, friends, or organization) need to espouse a perception of a supportive environment to encourage nascent entrepreneurs to take action in starting new firms. The likelihood that a potential entrepreneur will exploit an opportunity is very much influenced by the supportiveness of the culture or country in which a nascent entrepreneur lives (Leo-Paul, 1995).

Perhaps even more important than the opinions of family, friends and role models is what Kolvereid (1997) termed as the "motivation to comply" with these requests. Motivation to comply refers to the extent a nascent entrepreneur cares about the thoughts and opinions of family, friends or role models. If an individual is highly interdependent with their family, they will be more likely to identify themselves with the family and more likely to comply with group norms and be rewarded accordingly (Packer, 2008).

Emotions represent the tie which binds us to social norms; to the extent we feel positive emotions when we comply with social norms, we seek to do so. Greater family interdependence leads to valuing opinions of family more heavily. If individuals care deeply about the opinions of their family they will also likely care about their family's health, the overall health of the environment, and the future of the world that other family members will live in. When combined with state-level incentives for environmentally responsible entrepreneurship, family interdependence is likely to have a multiplicative effect on the level of new firm foundings through two mechanisms. First, family interdependence would increase the likelihood that potential entrepreneurs would want to engage in creating firms which their family will be proud of, and state-level incentives can convey normative legitimacy for doing so (Scott, 1995; Suchman, 1995). Second, family interdependence may increase the effect of state policies by encouraging entrepreneurs who are close to their families to provide for their family's future well-being through addressing environmental degradation while creating economic profit. This leads us to the following hypotheses:

Hypothesis 4a. States with higher levels of family interdependence social norms will also have a higher number of environmentally responsible new firm foundings.

Hypothesis 4b. State-level incentives will have a greater positive effect on the number of environmentally responsible new firm foundings in states which have higher levels of family interdependence social norms.

4. Research design and methodology

4.1. Sample

We examine our hypotheses in the context of the solar energy industry. The past decade has witnessed the significant growth of renewable energy markets (including solar energy production) in the U.S., which today constitute 7% of the total energy consumption in the nation (Energy Information Administration, 2007). Recently, solar energy technologies have been largely favored in the institutionalization of government based incentives, financial investments, and new business development (Rabe, 2006; Richtel, 2007). Indeed, solar installations (i.e., photovoltaic panels) in the U.S. grew by over 17% in the year 2008, one of the fastest growth rates among international markets (Solar Energy Industries Association (2008)). In addition, state-level governments have ratified legislation in favor of the implementation and growth of solar energy technologies. Popular amongst these are Renewable Portfolio Standards, which mandate a designated amount or percentage of power from renewable sources as a portion of the overall energy production in a state (Rabe, 2006).

The solar energy sector is particularly appropriate for this research because of its associated social welfare implications, which allow the examination of social norms in supporting its growth. In general, renewable energy technologies are believed to mitigate global warming and other pollution challenges; and are therefore often positioned as a solution to social and environmental problems (Vasi, 2006). This enables us to investigate how decentralized social norms—and their alignment with solar energy technologies—contribute directly to entrepreneurial activity and to the ability of centralized institutions to incent entrepreneurial action.

We explore how the enactment of U.S. state incentives that favor the solar energy sector, and the social norms within a state, impact firm founding rates in this sector, and how the interdependencies between these factors influence state-level firm founding rates. In the U.S., legislative action in favor of solar energy technologies has mostly taken place at the state-level (Rabe, 2006). Moreover, there are relevant differences in the adoption and implementation of solar energy technologies across states (Sherwood, 2005). These trends, together with empirical evidence that social norms vary between state-level boundaries in the U.S. (e.g. Kennedy et al., 1998; Uslaner and Brown, 2005), motivated our use of the state as the central unit of analysis.

Given constraints in the availability of data for our measure of social norms, we test our hypotheses on a sample of 45 U.S. states. Our analysis excludes the states of Nebraska, New Hampshire, Nevada, Rhode Island, and Utah (since these states are not included in the General Social Survey (GSS) data from which we measure state-level social norms). Further assessment of new firm entry in these states suggests that there are no statistical differences between the mean firm foundings in solar energy in these states as compared to the rest of the sample ($z = .45$; $p = .652$).

We examine our hypotheses through a longitudinal analysis for the years 1999–2006. The period between the late 1990s and the early 2000s has been characterized by an increased number of state-level legislative actions in favor of the solar energy sector. Important amongst these is the enactment of Renewable Portfolio Standards, which many states have instituted during this time frame (Rabe, 2006). Moreover, this period has witnessed the drastic rise of renewable energy technologies in the US (Solar Energy Industries Association, 2008). Thus, the resurgence of renewable energy since the 1990s provides opportunities to understand how centralized and decentralized institutions contribute to entrepreneurial activity specific to the solar energy sector.

4.2. Data

The data for this research are collected from a variety of secondary sources. The measures of population density and firm entry are based on the information published in the World Directory of Renewable Energy Suppliers and Services, an annual publication providing a comprehensive overview of companies involved in various sectors of the renewable energy industry. Data for state-level legislative action are drawn from the Database of State Incentives for Renewables and Efficiency (DSIRE), which contains information on a variety of regulatory measures (e.g., subsidies, tax credits, laws) for each state in the renewable energy industry. Funded by the U.S. Department of Energy, the DSIRE database is regarded as the official source for archival and current information

pertaining to state incentives in renewable energy. In addition, this study uses data from the GSS—conducted by the National Opinion Research Council (NORC)—to estimate all social norms of interest within each U.S. state in the sample. Finally, measurements for our control variables are derived from a variety of sources including the U.S. Census Bureau, the U.S. Energy Information Administration, and the League of Conservation Voters.

4.3. Dependent variable

4.3.1. Solar firm founding rates

This analysis follows the typical custom in organizational ecology to consider the use of industry directories in assessing organizational foundings (e.g., Baum and Singh, 1994; Carroll and Hannan, 2000). This tradition usually assumes that the first year in which an organization appears in an industry directory is indicative of its founding date (e.g., Baum and Singh, 1994). Thus, to estimate annual foundings, we construct a count measure of the number of solar energy firms that appear for the first time in the World Directory of Renewable Energy Suppliers and Services for a particular year and state (based on the state in which the firm is headquartered). This directory represents the official and sole annual publication dedicated to providing a yearly summary of the renewable energy industry's trends and participants. In addition, since the number of new firms in a state may be sensitive to the size of a state, we divide our final count of new firms by state population⁵. We applied a logarithmic transformation to this proportion to ensure that the distribution of errors from the analysis is consistent with OLS assumptions.

4.4. Independent variables

4.4.1. State-level incentives

To measure state-level incentives we track the cumulative number of instances in which a state passes a law or an initiative that is favorable to solar energy companies (*state solar incentives*). This includes: the implementation of Renewable Portfolio Standards; personal, corporate, property, and sales tax credits; industry recruitment initiatives such as grants that seek to recruit or cultivate manufacturing and development in a particular sector; public benefit funds that are supported through surcharges on electricity consumption and aimed at supporting renewable energy programs such as rebates, education, or loans; mandatory green pricing programs in a state; and net metering initiatives that allow electricity generated by customers to flow back into the grid (offsetting the electricity consumed). The latter benefits solar energy technologies, which are more likely to be generated in a small scale. These data were collected from the Database of State Incentives for Renewables and Efficiency (DSIRE)—a source that tracks state-sponsored incentives for a variety of renewable energy applications. Furthermore, our final measure of state incentives was mean-centered to reduce the multicollinearity associated with the interaction effects of interest (Cronbach, 1987).

4.4.2. Social norms

Our independent variables for social norms are derived from Sensitive Data Files of the GSS conducted by NORC⁶. The GSS is a multistage, stratified sample of American society with a data-collection program designed to monitor social change within the United States (Davis et al., 2001). It is a widely used and respected social science data source which has been utilized by researchers in sociology, economics and political science. Some of the social norms examined in prior research include family interdependence and satisfaction (Buchmann and DiPrete, 2006; Kiecolt, 2003), trust and cooperation (Gächter et al., 2004), cultural conformity (Gibson, 1992; Van der Slik and Driessen, 2005), and environmentalism (Lubell, 2002). For an overview of the GSS survey method and sample please see Davis et al. (2001).

We utilized data from the GSS conducted in the years 1998, 2000, 2002, 2004, and 2006. The survey consists of a series of questions which measure individuals' opinions on a variety of topics, including the social norms we were interested in: *Environmentally responsible consumption*, *Conformity*, and *Family interdependence*.

Our first step in creating our independent variables was to collapse the individual data into averages for each state-year observation. We then conducted an exploratory factor analysis (Tabachnick and Fidell, 2007) for each of the social norms. Utilizing the GSS Codebook (National Opinion Research Center, 2007) we selected 38 questions we believed could apply to the social norms we were interested in (see Appendix A for a listing of all considered questions). For each of our social norms, we created a factor based on questions which: a) were reported for multiple years or b) successfully loaded into factors. For example, the questions that were used to measure consumption are: "...are we spending too much, too little, or about the right amount on the environment", "...are we spending too much, too little, or about the right amount on protecting the environment...", and "many of the claims about environmental threats are exaggerated". After following this process, our final factor for Environmental Consumption Norms explains 11% of the variance and the alpha reliability for this three item scale is .64. Factor 2, Conformity, explains 56% of the variance and this 3 item scale has an alpha reliability score of .80. Factor 4, Family Interdependence, explains 34% of the variance and has an alpha reliability score of .70. Each of our final factors and the questions utilized to create them are listed in Table 1.

⁵ Our choice for this approach is based on the high collinearity between state population and other controls of interest (specifically, organizational density; with a correlation of .76 with state population). Given the potential instability that these relationships could introduce to the results of the analysis, we chose to normalize all variables that are sensitive to the size of a state by state population, as opposed to including the latter as a separate control.

⁶ The Sensitive Data Files were obtained under special contractual arrangements designed to protect the anonymity of respondents. These data are not available from the authors. Persons interested in obtaining GSS Sensitive Data Files should contact the GSS at GSS@NORC.org.

Table 1

Exploratory factor analysis for social norms.

Items	Mean	Std. dev.	Factor 1: Environmentally responsible consumption	Factor 2: Conformity	Factor 3: Family interdependence
1. We are faced with many problems in this country, none of which can be solved easily or inexpensively. I'm going to name some of these problems, and for each one I'd like you to tell me whether you think we're spending too much money on it, too little money, or about the right amount. First (READ ITEM A) . . . are we spending too much, too little, or about the right amount on (ITEM)? ...The environment	2.57	0.19	0.52		
2. We are faced with many problems in this country, none of which can be solved easily or inexpensively. I'm going to name some of these problems, and for each one I'd like you to tell me whether you think we're spending too much money on it, too little money, or about the right amount. First (READ ITEM A) . . . are we spending too much, too little, or about the right amount on (ITEM)? ...Improving and protecting the environment	1.72	0.19	0.76		
3. How much do you agree or disagree with each of these statements? ...Many of the claims about environmental threats are exaggerated Strongly agree Agree Neither agree nor disagree Disagree Strongly disagree Can't choose No answer Not applicable	3.17	0.29	0.74		
4. There are different opinions as to what it takes to be a good citizen. As far as you are concerned personally on a scale of 1 to 7 how important is it to... ...Always vote in elections	6.15	0.4		0.60	
5. There are different opinions as to what it takes to be a good citizen. As far as you are concerned personally on a scale of 1 to 7 how important is it to... ...Never try to evade taxes	6.40	0.34		0.70	
6. If you had to choose, which thing on this list would you pick as the most important for a child to learn to prepare him or her for life? [INTERVIEWER: READ CHOICES] a. Which comes next in importance? b. Which comes third? c. Which comes fourth? ...To be well liked or popular	4.67	0.25		0.44	
7. Would you use this card and tell me which answer comes closest to how often you do the following things... ...Spend a social evening with relatives?	3.39	0.44			0.46
8. And now some questions about your father. How often do you see or visit your father? He lives in the same household as I do Daily At least several times a week At least once a week At least once a month Several times a year	6.86	0.86			0.69

(continued on next page)

Table 1 (continued)

Items	Mean	Std. dev.	Factor 1: Environmentally responsible consumption	Factor 2: Conformity	Factor 3: Family interdependence
Less often					
Never					
My father is no longer alive					
I don't know where my father lives					
No answer					
Not applicable					
9. And what about your mother? How often do you see or visit her?	5.95	0.67			0.46
She lives in the same household as I do					
Daily					
At least several times a week					
At least once a week					
At least once a month					
Several times a year					
Less often					
Never					
My mother is no longer alive					
I don't know where my mother lives					
No answer					
Not applicable					
Eigen value			1.42	1.35	1.10

All of our scales except Environmental consumption (.64) met the criterion of .70 usually employed for analysis of alpha reliability (Hair et al., 1998). However, we decided the relatively low reliability for this factor was acceptable because reliabilities of between .50 and .60 can be considered adequate in the early stages of scale development (Nunnally, 1978) and similarly low reliabilities have previously been reported by management scholars (Bae and Lawler, 2000; Sun et al., 2007). Factors were mean-centered to reduce multicollinearity (Cronbach, 1987) and to better estimate the effect of the relative difference between state-level social norms and the national average. Because GSS data were only available for 1998, 2000, 2002, 2004 and 2006, we estimated the values for the years in between by using linear interpolation.

4.5. Control variables

We consider a variety of controls at the state level. First, we control for the regulatory environment of electricity markets in a state (*Regulation in electricity markets*). To do so, we include a categorical variable at the state-year level that is coded as “–1” for regulated states that have more concentrated and monopolistic energy industries and “1” for deregulated states, with more competitive electricity markets. Data for this variable come from the Energy Information Administration. We also control for the organizational density of the solar energy sector. Studies in population ecology have found an inverted U-shaped relationship between density and founding rates, suggesting that firm foundings are dependent upon the size of an industry or sector (Carroll and Hannan, 1989; Hannan and Freeman, 1984). Hence, to consider this effect, we constructed a variable of organizational density (*Organizational density solar firms/population*), measured as a count of the total number of solar companies known to exist in a state for a given year (Carroll and Hannan, 1989; Hannan and Carroll, 1992). Data for this variable were collected from the World Directory of Renewable Energy Suppliers and Services. To account for the effect that the population of a state could have on the overall size of a sector, the final measure of this variable is divided by state population. Similarly, the analysis controls for the yearly median state income as reported by the U.S. Census Bureau (*State median income*).

We also control for the overall political climate of a state by including each state's annual scores (both House and Senate) from the League of Conservation Voters scorecard (*League of conservation voters score*). The scorecard awards points based on how members of congress from a state voted on environmental measures, and thus represents the political support in a state for environmental causes. The data are publicly available from the League of Conservation Voters.

To ensure our analysis identified the specific effects of policy and norms on environmental entrepreneurship, not the general level of entrepreneurship overall, we controlled for entrepreneurial growth for each state for each year. *Entrepreneurial growth* was measured utilizing the Kaufman Index of Entrepreneurial Activity (KIEA) (Fairlie, 2008). The KIEA measures the percent of individuals (ages 20–64) who do not own a business in the first survey month and then start a business in the following month with 15 or more hours worked. We utilized the annual summary report on state levels of entrepreneurial growth as a proxy for entrepreneurial activity in each state-year. These data are publicly available at www.kaufman.org/kaufmanindex.

Our analysis also includes yearly dummy variables that allow us to control for year-level effects that may influence the relationships of interest. We employ a fixed effects model which enables us to control for any unobserved heterogeneity at the state-level that may not be captured by our control variables.

Table 2
Summary statistics and pairwise correlations.

	Mean	S.D.	Min	Max	1	2	3	4	5	6	7	8	9	10
1	.0001	0.0002	0	.0016	1.00									
2	2.74	2.36	0	10	0.17**	1.00								
3	2.15	0.29	.572	2.81	0.05	0.14**	1.00							
4	3.11	.86	3	9.11	-0.12*	-0.09	0.08	1.00						
5	4.00	1.31	.323	9.67	0.10	0.00	-0.46***	1.00	1.00					
6	.0005	0.0008	0	.005	0.65***	0.26***	0.01	-0.15**	0.12*	1.00				
7	-0.29	0.96	-1	1	0.11*	0.45***	0.23***	-0.03	-0.19**	0.18***	1.00			
8	43663.95	7079.31	29297	68059	0.14**	0.40***	0.19**	-0.12*	0.10	0.29***	0.30***	1.00		
9	87.99	57.64	0	200	0.16**	0.48***	0.17**	-0.06	-0.03	0.36***	0.39***	0.39***	1.00	
10	29.56	9.39	8.87	72.37	.16**	.05	-.26***	.01	.22**	.13*	-.29***	-.06	-.23***	1.00

*** $p < .001$; ** $p < .01$; * $p < .05$

^a Logged

Table 2 presents the summary statistics for all variables of interest. The mean number of new solar energy firms for a given year and state is .72 (.0001 for the log of new solar firms divided by state population); with a minimum of 0 and a maximum of 25 new firms for a given state and year. The average number of state incentives in favor of solar energy for the states in our sample is 2.74; with a minimum of 0 and a maximum of 10.

4.6. Analysis

We used panel data techniques with fixed effects to test our hypotheses. This approach enables us to model the variance within a state in firm founding rates and to control for any unobserved heterogeneity that is constant across time (Greene, 2006). We use a lagged data structure to conduct the analysis. Studies of firm foundings often assume a one-year lag between the antecedents of interest and the founding rates of organizations (e.g., Baum and Singh, 1994; Lounsbury, 2002). Following this, this analysis applies a one-year lag between the independent variables (measured at time $t-1$) and the dependent variables (measured at time t) of interest. Finally, while the use of a panel design introduces the potential for serial correlation (Wooldridge, 2002), statistical assessment using the Wooldridge test (Wooldridge, 2002) suggests that our analysis is not subject to such limitation ($p > .46$).

4.7. Results

Table 3 summarizes the results for the fixed effects analysis. As can be observed in Model 1 with all control variables, the organizational density of solar energy firms in a state is positively related to the number of firm foundings in that state ($t = 8.79$; $p = .000$). Similarly, the findings in Model 2 indicate that as hypothesized in H1, there is a positive relationship between the number of state-level incentives in favor of solar energy and firm founding rates in this sector ($t = 2.58$; $p = .010$). For an increase of one standard deviation in the presence of state-level incentives, we see a corresponding 21% increase in our dependent variable. Model 2 also reveals that as environmental consumption norms become stronger in a

Table 3

Results of fixed effect analysis for new solar energy firms (log of number of new solar energy firms/state population).

Variables/Model #	1	2	3	4	5
<i>Controls</i>					
Regulation in electricity markets	−0.009 (0.174)	0.084 (0.177)	0.080 (0.178)	0.071 (0.175)	0.085 (0.176)
Organizational density solar firms/population	0.299*** (0.034)	0.288*** (0.033)	0.288*** (0.033)	0.283*** (0.033)	0.283*** (0.033)
State median income	−0.056 ⁺ (0.032)	−0.062* (0.032)	−0.061 ⁺ (0.033)	−0.056 ⁺ (0.032)	−0.062* (0.032)
League of conservation voters score	−0.006 (0.036)	−0.030 (0.037)	−0.031 (0.037)	−0.032 (0.036)	−0.027 (0.037)
Growth in entrepreneurship	0.042 (0.090)	0.031 (0.088)	0.031 (0.088)	0.022 (0.087)	0.021 (0.088)
State and year fixed effects (not reported)					
<i>Independent variables</i>					
State solar incentives		0.208** (0.080)	0.207** (0.081)	0.172* (0.081)	0.191* (0.081)
Environmental consumption norms		0.719* (0.343)	0.749* (0.386)	0.665* (0.340)	0.575 ⁺ (0.351)
Conformity norms		−0.058 (0.118)	−0.055 (0.119)	−0.082 (0.117)	−0.066 (0.118)
Family interdependence norms		0.175* (0.079)	0.177* (0.080)	0.142 ⁺ (0.080)	0.144 ⁺ (0.081)
<i>Interactions</i>					
State incentives × environmental consumption norms			0.022 (0.128)		
State incentives × conformity norms				−0.010** (0.004)	
State incentives × family interdependence norms					0.034 ⁺ (0.019)
Constant	2.22E−04 (1.55E−04)	2.64E−04 (1.52E−04)	2.59E−04 (1.55E−04)	2.34E−04 (1.51E−04)	2.68E−04 (1.52E−04)
Observations	315	315	315	315	315
Adjusted R-squared	0.080	0.144	0.141	0.162	0.151

*** $p < 0.001$, ** $p < 0.01$, * $p < 0.05$, + $p < 0.10$.

Variables scaled for ease of interpretation.

Note: Standard errors in parenthesis.

state, the number of new firm foundings in the solar energy sector in that state also increases ($t = 2.09$; $p = .037$)—thereby providing support for H2a. An increase of one standard deviation in the level of environmental consumption norms in a state corresponded with a 72% increase in our dependent variable. While this relationship is not statistically significant for social norms of conformity ($t = -0.49$; $p = .626$), our analysis suggests that there is a positive relationship between norms of family interdependence in a state and new firm foundings in the solar energy sector ($t = 2.21$; $p = .028$). The latter confirms H4a. Indeed, we find that for an increase of one standard deviation in the norm of family interdependence in a state, there is an associated 18% increase in our dependent variable.

Findings from Model 3 suggest that the relationship between centralized state incentives and firm founding rates does not appear to be associated with norms of environmental consumption ($t = .17$; $p = .862$). Hence, we cannot reject the null hypothesis. In addition, we find that as norms of conformity decrease, the relationship between state-level incentives and firm founding rates becomes stronger ($t = -2.54$; $p = .012$). Thus, as hypothesized (H3b), states with lower levels of conformity norms are more likely to observe the effect of state incentives on entrepreneurial action than states with high levels of conformity norms. This relationship is illustrated in Fig. 1. Finally, our analysis in Model 5 suggests that—although marginally significant—an increase in norms of family interdependence is associated with a stronger relationship between state incentives and firm founding rates ($t = 1.77$; $p = .078$). Thus, we find some support for H5b.

We conducted a variety of sensitivity analyses to confirm the robustness of our results. First, we tested the validity of the use of an aggregate measure of state-level incentives. To do so, we split up this measure into different categories of incentives including industry recruitment incentives (e.g., programs to attract investments), financial incentives (e.g., tax breaks), and renewable portfolio standards. Each of these categories represented distinct predictor variables—measured as the count of incentives enacted within a state for a particular category—and were tested independently. Results from this analysis for all hypotheses of interest were statistically consistent (same direction and statistical significance) with those employing an aggregate measure of state incentives. Therefore, the type of incentive (as represented by these categories) does not seem to have a different effect on firm founding rates or to be influenced differently by the surrounding social norms. This in turn validates our choice for an aggregate measure of state-level incentives. Second, the use of fixed effects prevented the inclusion of time invariant control variables that may be of importance to our study. Of particular relevance is the amount of solar radiation available in a state. We used an alternative methodology for all models of interest that included a control variable for solar radiation measured as the average annual solar radiation in a state (in watt-hours/m²/day). The findings from this analysis were statistically consistent with those of the fixed effects models. Hence, despite the natural potential for solar energy that a state enjoys, the role of state-sponsored incentives and social norms continues to be important in fostering entrepreneurial action.

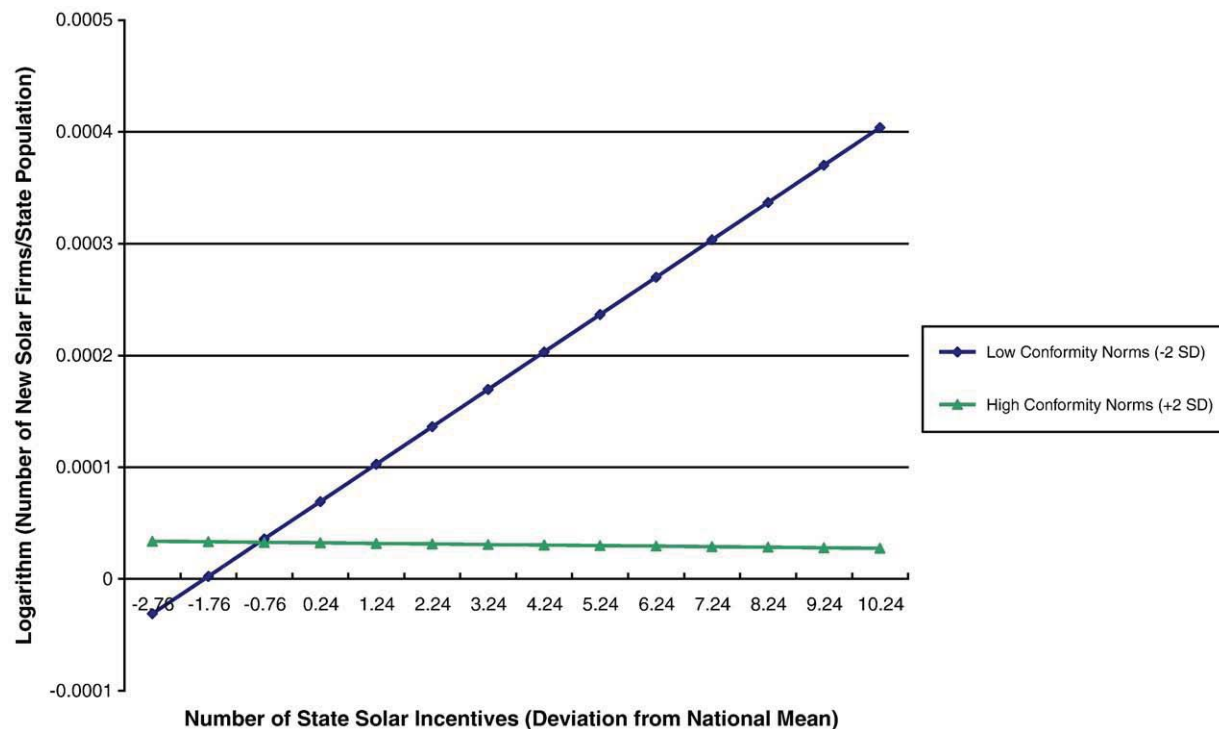


Fig. 1. Interaction effect between state solar incentives and norms of conformity.

5. Discussion and conclusion

5.1. Limitations

As with all empirical research, ours is not without limitations. First, the availability of data constrained our analysis to a time period that is not reflective of the entire lifecycle of the solar energy sector. Thus, our findings cannot be generalized outside of this particular time frame. Second, our analysis is confined to entrepreneurial activity in the solar energy sector. Although the practices of this sector reflect environmentally responsible behavior, it is not representative of the broad spectrum of environmental entrepreneurship. Future research should explore the theoretical underpinnings of this study in different environmental entrepreneurship contexts. Third, we developed measures of social norms at the state level based on a sub-sample of questions that appeared to be relevant to a specific type of norm. Data for this measurement were obtained from the GSS. We did not, however, collect data directly from participants, which constrained our freedom to capture certain answers and design a particular scale. This limitation also represents opportunities for future research. For example, future studies could validate our measures by assessing the relationship between GSS answers and those from more specific questions that address the social norms of interest.

5.2. Implications

The topic of environmental entrepreneurship is an emergent area in entrepreneurship research. While scholars (Cohen and Winn, 2007; Dean and McMullen, 2007) have posited that economic, institutional, and sociological perspectives exist to explain the emergence of environmental entrepreneurship, sparse theoretical or empirical evidence exists to support the claim of a sociological component. This study is the first to empirically test the sociological aspect of environmental entrepreneurship by directly assessing the impact of social norms.

5.2.1. The impact of social norms on entrepreneurship

Our results indicate that social norms do have an impact on the founding rate of environmentally responsible new ventures. Specifically, our findings provide initial evidence to support our theory that areas with higher norms of environmentally responsible consumption have higher levels of entrepreneurial foundings in support of environmental practices. These results were obtained over and above the presence of state-level incentives and other traditional explanations of entrepreneurial founding rates. Political climate (Hiatt et al., Forthcoming; Sine and Lee, 2009), regulatory environment (Russo, 2001), and organizational density (Rao, 2004) have been used to explain the founding rate of entrepreneurial firms. This study specifically controlled for these factors and found that beyond these considerations, social norms explain the variance in the founding rates of environmentally responsible new firms. Thus, social norms in the local context should be considered in complementing other factors that partially explain entrepreneurial action.

Our findings also support the theory that if an individual lives in a region where people are more closely connected and in tune with their family, they may be more inclined to want to start entrepreneurial ventures providing an environmentally beneficial product or service. Alternatively, if an individual is highly interdependent with his or her family they likely also want to take care of their family and ensure their health and well-being. Starting a new venture that promotes a healthy environment is one way to take care of family and will likely be more poignant to individuals who wish to provide their loved ones with a healthy and sustainable physical environment. The practical implication of such a finding leads us to posit that one may find more support for environmental entrepreneurship in areas where there are high levels of family interdependence. Our findings could indicate that family interdependence has a link to environmental entrepreneurship through generational transfer of business ownership. In family businesses, the succession process often leads to the behaviors, ideology and vision of the founders trickling down from one generation to the next (Chua et al., 1999). Thus, if a high value is placed on a healthy environment, future generations of family business owners or managers may place a high emphasis on maintaining a healthy environment in addition to remaining profitable. This potential linkage represents an opportunity for future research combining the family business literature with environmental considerations.

Our findings suggest that future studies on the determinants of entrepreneurial founding rates should not only examine the effect of differing policies and levels of political freedom, but also the rich cultural context, represented by social norms, in which potential entrepreneurs seek to discover and create opportunities. Social norms are likely to directly impact founding rates of all entrepreneurship; the context of environmental entrepreneurship simply makes it easier to identify and test appropriate social norms. Future studies outside of the environmental context could refine our understanding of the impact of social norms on entrepreneurial action.

5.2.2. The impact of social norms on policy efficacy

Our results indicate that social norms not only have a direct impact on entrepreneurial action, but they can also influence the effect that more centralized institutions—specifically, government-sponsored incentives—have on the founding rate of environmentally responsible firms. First, we found that norms of low conformity increase the effect of legislation on firm foundings in the solar energy sector. This finding suggests that policy designed to encourage environmentally responsible practices may be more effective in areas in which individuals do not place a premium on conforming to societies expectations. Since government policies are often designed to offer innovative incentives and challenge the dominant paradigm of separating environmental and business concerns (Gladwin and Kennelly, 1995), it is understandable that such policies would be more effective in regions where there is a low value of conforming.

Over time, we would expect this relationship to change as environmental entrepreneurship becomes less of a fringe activity and environmental norms become more prevalent in the business community.

Second, as family interdependence norms increase; state-level incentives have a marginally stronger relationship with firm foundings in the solar energy sector. This implies that there is a multiplicative effect between the presence of these norms and state incentives, such that entrepreneurs who wish to take advantage of the regulatory environment may be even more receptive to these benefits when they have high family interdependence.

Taken together, these findings have implications for future research on both economic (Dorfman and Dorfman, 1993; Olson, 1965; Pigou, 1932) and political science (Ostrom, 1990, 1998, 2000) approaches to solving environmentally relevant market failures that are remedied by entrepreneurial action. While there is a rich literature in economics examining the efficacy of policies in correcting market failure, and there is ample empirical evidence showing the effect of social norms in overcoming market failure, these two streams have seldom been integrated. This study suggests scholars should more closely examine the interaction of policy with social norms in addressing market failures such as environmental degradation. As Ostrom (1998) points out, “A coherent theory of institutional change is not within reach, however, with a theory of individual choice that predicts no innovation will occur. We need a second-generation theory of boundedly rational, innovative, and normative behavior” (9). While we make no claim to offer such a theory here, we do offer evidence that the interaction of social norms with policy decisions would be an important factor in solving this puzzle.

5.2.3. Practical implications

For entrepreneurs and managers, our findings outline a strategic framework for locating start-up activities. Taking the time to truly understand the social norms of the context in which a business operates could yield dividends. This is intuitively clear, as renewable energy entrepreneurs have flocked not only to Silicon Valley where there is a social norm of high investment in start-ups, but also to Portland, Oregon where there is a high level of social norms which value sustainable venturing (Pernick and Wilder, 2007). Choosing a business location may be about more than the resources at hand; it may also be about selecting the culture in which the business will thrive. For policy makers, this study implies that understanding the prevalent norms of a region may be an important consideration when designing incentives and regulations. While direct incentives have some effect, understanding prevalent, socially enforced beliefs may lead to maximizing the impact of policy seeking to encourage entrepreneurship or the adoption of environmentally beneficial practices.

5.3. Conclusion

While the influence of traits and situational factors have largely been dismissed as drivers of entrepreneurship, an examination of how norms impact levels of entrepreneurship can help us understand not only why some individuals choose to become entrepreneurs, but why they choose specific businesses to initiate. We may need to start asking not only what predicts entrepreneurship, but what predicts entrepreneurship which creates societal benefits (Baumol, 1990). This study offers a glimpse of the power social norms have to influence not only entrepreneurial action, but also the efficacy of policy decisions which seek to create economic and environmental benefits for society. Our hope is that through our empirical work, we will motivate others to join us in the examination of how the pervasive social norms around us provide guardrails for the entrepreneurial journey.

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