

Changing Family Habits: A Case Study Into Climate Change Mitigation Behavior in Families

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Received: September, 2011; Accepted: April, 2012

Abstract

A case-study methodology was used to explore the process of change as experienced by 3 suburban families in an attempt to incorporate climate change mitigation behavior into their day to day life. Cross-case analysis of the findings revealed the emergence of three major conceptual themes associated with behavior adoption: collectively applied competences such as self-efficacy and perseverance; shared ecological values among family members; and collaborative family dynamics. Based on these findings, the authors conclude by outlining the lessons learned in terms of their potential for policy makers and possible educational programs for families looking to adopt a more sustainable lifestyle.

Keywords: Environmental education, environmental behavior, climate change mitigation, environmental competences, family systems.

Introduction

This paper contributes to the growing body of research concerned with climate change and the need to adopt more widespread mitigation behavior at the local level. The literature on public awareness of climate change points to general concern, yet there is a lack of meaningful societal engagement with the issue (Whitmarsh & O'Neill, 2011, p.3). For instance, environmental psychology literature reveals a number of factors involved in deciding to adopt environmentally sound behavior (Hwang, Kim & Jeng, 2000; Pruneau, *et al.*, 2006). Knowledge, past experiences with nature, established behavioral patterns, values and social networks are just some of the cognitive and affective factors reportedly at play (Kollmuss & Agyeman, 2002). In addition to these factors, perceptions literature identifies important psychological and physiological barriers to change such as dissonance and denial (Seidel, 1998).

In the present study, we look to better comprehend the processes involved in successfully adopting mitigation behavior in families. We are particularly interested in documenting the

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factors influencing their change as a social group and understanding the interaction dynamics involved in their day to day experience of undertaking chosen behavioral changes. Moreover, we are curious as to the various competences demonstrated by family members, both individually and as a social group, as they seek to integrate new environmental behavior. Though literature on environmental behavior has led to a better understanding of influencing factors and barriers to change, few studies have considered these notions as they relate to the family. To the best of our knowledge, fewer still have examined the process of change over several months as it applies to families who want to integrate climate change mitigation behaviours. Our research looks to pursue this very objective, with both policy makers and educators in mind, by reporting on the lessons learned in regards to the processes involved in adopting new mitigation behavior in the context of the family.

Background

Though there are many theories on behavior in psychology literature, two general theories of behavioral change are often cited in field of environmental education: Ajzen's (1991) Theory of Planned Behavior and Prochaska, DiClemente, and Norcross's (1992) Transtheoretical Model of change (TTM). In Ajzen's theory, people's voluntary behavior is determined by three kinds of beliefs: beliefs about the likely consequences of a behavior (*behavioral beliefs*), the opinions of others if they engage or not in a behavior (*normative beliefs*), and the feasibility of the behavior in question, that is, their perceptions of how easy the behavior will be (*control beliefs*). Each of these components has an effect on adopting new behaviors. The TTM (Prochaska *et al.*, 1992) has five stages: *precontemplation*, *contemplation*, *preparation*, *action*, and *maintenance* of the behaviour. Located on a continuum, these five stages represent the gradual progression people make from the time they are not thinking about changing to the time the behavior in question has become a habit. The authors explain that some change strategies, such as *reinforcers* and *helping relationships*, used by people themselves or by their caregivers, facilitate the passage from one stage to another in the model. Armitage *et al.* (2004) add that in addition to these strategies, personal self-efficacy (people's opinion of their own ability to efficiently deal with a difficult situation) can also facilitate the passage from one stage to another in the TTM (Prochaska *et al.*, 1992).

Several studies have focused on the factors that foster and limit the adoption of environmental behaviors. Pruneau *et al.* (2006) graphically represented the factors that, according to research, seem to positively influence the adoption of environmental behaviors. Pruneau *et al.* groups these factors into three categories, in accordance with Hwang, Kim, and Jeng's (2000) typology: cognitive, affective, and situational.

Cognitive factors directly influence environmental action (Hungerford & Volk, 1990). However, Hwang, Kim, and Jeng (2000) consider that knowledge alone does not guarantee the adoption of an environmental behavior because such a change also presupposes expressing the intention to act. People's competences equally have an impact (Hungerford & Volk, 1990). Competences are generally defined as a set of resources: cognitive (e.g., knowledge, know-how, knowing how to act), metacognitive (e.g., knowing how to observe, control, and improve one's cognitive strategies); conative (motivation to act); physical and social (calling on an expert); spatial (efficient use of space); temporal (relevant organization of time); material (use of a book); and affective (Joannert *et al.*, 2004). In fact, little research has identified the environmental competences associated with adopting climate change *mitigation* behavior in families.

Moreover, the intention to act often appears where affective factors are concerned, that is, a person's (public or non-public) expression of their wish to act (Hines, Hungerford, & Tomera, 1986/1987). Altruism, characterized by empathy and solicitude, represents another important affective factor (Berenguer, 2007; Borden & Francis, 1978). Accordingly, individuals who prioritize altruistic values often have marked environmental beliefs and tend to engage more in pro-environmental actions than those who hold egoistic values (Joireman *et al.*, 2001; Gärling *et al.*, 2003).

Throughout the literature, researchers almost always collected their results by interviewing participants when new behaviors had turned into habits. Few researchers observed, over an extended period of time, the experience of people who began integrating and attempted to maintain such behaviors. This kind of research is nevertheless important. For instance, a better understanding of how families integrate climate change mitigation behavior could lead to policies that are more effective in reducing our impact on the climate, especially from levels of government which are closer to the people (e.g. municipalities). A better grasp on how families and communities can change their greenhouse gas producing habits seems even more important today in light of a virtual political withdrawal from climate change mitigation policies on the national scene in Canada. Indeed, Stoett (2009) points to a lack in federal leadership on this issue in Canada, citing the following cuts, all in the past six years: the much publicized *One Tonne Challenge*, 40 public information offices across the country, funding for scientific and research programs on climate change and the *Home conservation rebate plan*.

From an environmental education standpoint, implementing such policies should include educational elements to help families succeed in their attempted behavioral change. The present research looks to contribute to the scientific foundation for improved policies aimed at fostering climate-friendly family-wide behavior by (1) examining which daily family habits are easier and more difficult to change and (2) exploring the influence of the group competences, strategies, and inter-relational dynamics on integrating sustainability behavior in families.

Method

Research Approach

The methodological approach guiding the present study is rooted in the qualitative research paradigm. Since the focus of our inquiry is on the processes of interaction among members of participating families, we adopt a social constructivist point of view regarding our findings. A qualitative approach was applied to all aspects of the research design: inquiry, data collection and data analysis. Thus, the present report uses quotes from participants to interpret the complexity of the problem (the public's lack of action in light of impending global climate change) and attempts to inductively establish patterns or conceptual themes in order to better understand behavioral change in families.

Study Cases

Our research is a multiple case study (Creswell, 2007) in which we followed three suburban families living in Dieppe, a small Canadian city, as they attempted to incorporate various climate change mitigation behavior into their day-to-day life over the course of eight months. Our study was also exploratory as it examined the adoption of environmental behavior in a new context, that of the family.

Two criteria were used to choose cases: families in which at least one member expressed prior environmental attitudes and a wish to change, as well as families who accepted to share their experience with the researchers. Potential participating families were identified

by sending out letters outlining the study to parents of grade seven students already involved in a school sponsored environmental project. From the two classes solicited, five families returned the letter indicating their interest in the present research project, hence their intent to adopt a more sustainable family lifestyle. Two of these families eventually withdrew due to time concerns, leaving three case families. Of these three retained cases, two were nuclear families of four, whereas the other was a blended family of five. In the *results* section, Table 1 presents further details on members of these families as well as their reported environmental behavior before and after the project.

Data Collection

Throughout the project, family members chose (without any help) new behaviors they wished to try and the pace at which these new behavior were to be integrated. All three cases were accessible and ordinary cases from which we collected data through multiple sources: individual journals, personal interviews (prior to starting their chosen actions as well as after one, three and eight months), and family group interviews (same frequency as personal interviews). Confidentiality was provided in all aspects of this research as we assigned pseudonyms* to members of each family and kept data secured and available to involved researchers only (with written consent from all participants prior to beginning the study). Approval was also obtained by the Université de Moncton's Ethics Committee on research involving human participants following a review of proposed methodology including all data collection tools.

Firstly, we conducted preliminary interviews with the participating families in order to better understand the characteristics of each case. During the project, members of each family kept a reflexive journal in which he or she wrote information about his or her personal process of change: behaviors that were integrated, attitudes toward these behaviors, and the successes and challenges encountered. The journal also included specific questions on the strategies employed by the participants to change their habits, on the personal competences that helped, and on the elements of the family dynamic that may have influenced the process. Here are a few examples of the questions found in the reflexive journal: *Could you describe the actions that you are engaged in that will help the climate? How is it going? Could you tell me about what happens in your family regarding actions to help the climate? Could you describe about the means used by your family to successfully carry out these actions?*

During individual interviews, the participants were asked to talk more about the experiences that they recorded in their reflexive journal. Here are a few examples of the questions asked: *Could you talk to me about the means used by your family and yourself to successfully carry out the actions you chose? Could you talk to me about the help you received from some members of your family? Could you talk to me about what drives you to continue performing your actions?* As planned, we conducted individual interviews at the beginning of the project, as well as one and three months later. At each of these points in time, we also conducted a group interview with each family in which open non-directed discussion took place between members regarding their change experience. Throughout these unstructured family meetings, a secondary researcher mediated the conversation while the principal researcher acted as an observer and focused on the family dynamics during the decision-making process.

Data Analysis

From the 30 interviews and collected monthly journals, a within-case thematic analysis was first undertaken to identify and describe the various themes surrounding the discourse of all

* All names in this article are pseudonyms.

case-family members. During this process, two analysts independently established codes to represent emerging themes within each case and compared their results. In order to identify various competences, the two analysts used the Table of Competence Indicators proposed by Kerry (2010). For instance, Kerry associates citizenship with a sense of duty and a desire to contribute to a common good. Kerry also links self-regulation to one's ability to control emotions and perseverance to one's refusal to quit in the face of adversity. An inter-rater reliability score of 96% was then calculated, contributing to the validity of established themes.

From these theme codes, the data were then refined through the writing of narratives (Giorgi & Giorgi, 2003). A total of 3 narratives were written for each case, representing the progression of each family through the change process after one month, three months and eight months. Both descriptive and interpretive in form (Van Manen, 1990), they chronologically recounted each family's quest for a "greener" lifestyle in terms of the challenges they encountered, their demonstrated competences and inter-member relational dynamics. Adding to the validity of results through triangulation, all narratives were subsequently returned to participants for verification of authenticity. Working with the corroborated narratives, we then looked at similarities and differences across cases in order to isolate the principle themes common to all cases.

Finally, a third level of analysis was applied using "conceptual categories analysis" (Paillé & Mucchielli, 2008, p.233). During this phase, we looked to establish general conceptual constructs by centering on apparent relationships between common themes. Adapted from a template suggested by Creswell (2007, p.172) for coding a multiple case study, Figure 2 illustrates the levels of analysis used in this study.

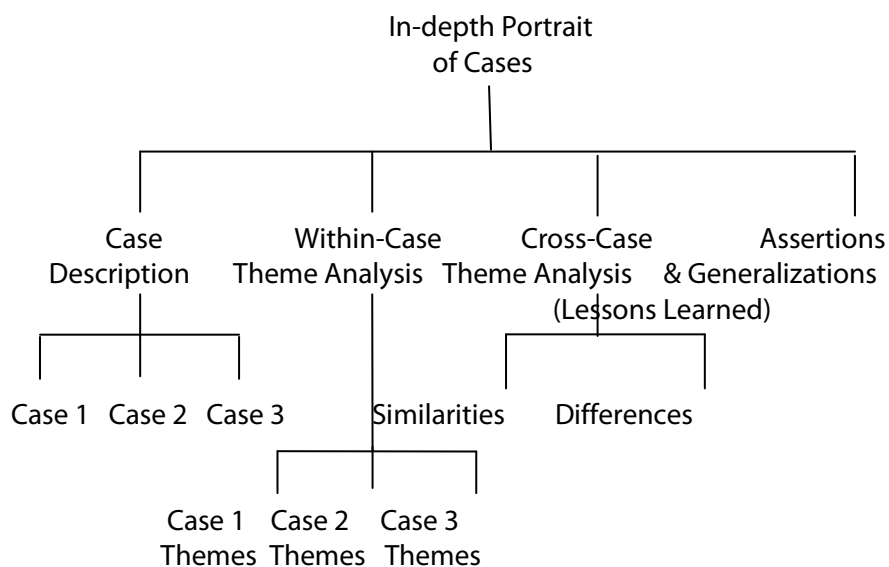


Figure 1. Levels of applied analysis

Results and discussion

By the end of the study, both the Landry and Pelletier families were able to integrate several easier energy saving behaviours like shutting out the lights, reducing hot water use as well as reducing waste and plastic use. In fact, these two families maintained such actions throughout the eight-month study. However, in both these cases, the participants had

difficulty integrating more difficult actions such as carpooling. Though the Goguen family was also successful in implementing similar behaviors in the short term (all of the actions attempted by the first two families were also tried by the Goguens), these actions were more numerous than in the first two cases and included more complex behavioral changes such as composting, green landscaping and selling their second vehicle. Notwithstanding, after three months, the Goguen family ultimately abandoned the project and returned to initial consumer-dominated habits. Table 1 lists initial routine environmental behavior for each case family before the project as well as behaviors adopted and maintained at the end of the project.

From the various data collected throughout the eight month experimental period, we report that family members who encounter challenges associated with their behavioral change experience tended to apply a number of competences that seem to help them to persist in their targeted behaviours: *collaboration* (Denise: “This project is a team effort... we work together... everyone pitches in with friendly reminders and encouragement”), *citizenship* (Charline: “The impacts of climate change are scary... we need to change our habits so that the planet is good condition for others.”), *self-regulation* (Serge: “I don’t forget to shut the lights in my room anymore... it’s become a habit.”), *perseverance* (Roland: “I tried using a timer to limit my time in the shower, but the one I bought didn’t work... I found another way.”), *self-efficacy* (Jean: “I believe that all the actions we’re trying are easy... it’s all in the approach and the level of conviction... I believe I can do it.”), and *decision-making* (Corinne: “Just the other day, a clerk asked me if I wanted a bag... I thought about the plastic I would have to throw out and answered No.”).

Table 1.
Reported mitigation behaviors from start to end of project

		Family members		Mitigation behavior at start of project	Mitigation behavior at end of project
Participating Families	Landrys	Roland	Father	-Recycling -Shutting lights -Using smaller car for long trips	-Conserving energy -Reducing water use -Using cloth bags -Recycling -Waste-free lunches -Programmable thermostat
		Denise	Mother		
		Charline	Child (age 12)		
		Maryse	Child (age 9)		
	Pelletiers	Gilbert	Father	-Recycling -Shutting lights -Limiting packaging in purchased items	-Conserving energy -Reducing water use -Using cloth bags -Recycling -Reducing use of car -Installed heat pump
		Corinne	Mother		
		Serge	Child (age 11)		
		Marc	Child (age 6)		
	Goguens	Jean	Father	-Recycling -Using bicycle -Using biological cleaning products -Buying local food (sometimes)	-Conserving energy -Reducing water use -Using cloth bags -Recycling -Composting -Gas free mower -Selling second car -Using bicycle & bus
		Debbie	Mother		
		Jacob	Child (age 15)		
		Sandra	Child (age 14)		
		Steve	Child (age 12)		

When we looked at these competences holistically, along with other reported factors such as values and family dynamics, three major “conceptual categories” (Paillé & Mucchielli, 2008,) seemed to emerge in the behavioral change process as experienced by participating families: *collective competency* (i.e., skills manifested by family members which contributed to successful integration by the entire family), *shared biospheric family values* (i.e., a shared

family value system where members apply a cost-benefit analysis in terms of biospheric ecological sustainability) and *collaborative family dynamics* (i.e., a healthy family dynamic characterized by team work and mutual understanding between members). Table 2 attempts to describe these three conceptual constructs by offering details such as a definition, a list of defining properties and a few representative quotes from the data.

Table 2.

Defining the major conceptual constructs identified through cross-case data analysis

Major Conceptual Themes	Collective Competences: <i>Collaboration</i> <i>Citizenship</i> <i>Self-regulation</i> <i>Perseverance</i> <i>Self-efficacy</i> <i>Decision-making</i>	Definition	Competences demonstrated by the family as a group in its attempt to affect collective behavioural change.
		Properties	- All family members demonstrate the competencies to some degree. - Demonstrated competence by one fosters that competence in others. - Competences are manifested in response to challenges.
		Supporting Excerpts	<i>We have a positive family attitude... everybody helps each other out</i> (Charline Landry on collaboration, journal entry after 3 months). <i>Making waste-free lunches was hard, but we kept it up ... the kids helped ... I said we do this, so it was important to me that it work</i> (Denise Landry on perseverance, interview after 3 months). <i>We feel like our family is making a difference for the planet</i> (Roland Landry on citizenship, interview after 8 months).
	Shared Biospheric Values	Definition	Shared family values that consider the importance of the planet or biospheric.
		Properties	- Values are common to all family members. - Values are based on a cost-benefit analysis in terms of planet-wide or biospheric sustainability.
		Supporting Excerpts	<i>Climate changes hurt the planet... we need to do something about it as a family... for polar bears and other animals</i> (Charline Landry, interview after 1 month). <i>My goal was to stop behaving in a way that harms the environment, but the problem was that my wife and kids did not share that same objective</i> (Jean Goguen, closing interview after 3 months).
	Collaborative Family Dynamics	Definition	Family dynamics characterized by collaborative interactions between members.
		Properties	- Family members work together as a team towards shared goals. - Mutual understanding is inherent to all systemic interactions. - Family dynamics resemble those of a balanced system.
		Supporting Excerpts	<i>I think we succeeded our actions because we collaborated all together, when things went well and when things were harder ... we worked as a team</i> (Roland Landry, interview after 8 months). <i>We communicate well as a family... everybody helps out and we're in this thing as a family</i> (Corinne Pelletier, interview after 3 months).

Like Kaiser and Wilson (2004), we believe that family values play an important role in choosing and sustaining environmental behavior. More specifically, our data seems to indicate that a family's successful integration of mitigation behaviors is facilitated when all members share a collective value system which is altruistic or biospheric in nature. Such a collective biospheric family value system represents the second of our three major emergent conceptual themes. While the Landry and Pelletier families both shared a common

environmentally-sensitive value system, altruistic in nature, the Goguen family lacked such common values. In their case, Debbie, the mother, clearly demonstrated more egocentric values, while her husband Jean was driven by more biospheric values. It is our belief that this lack of a common altruistic value scheme contributed significantly to their difficulty in integrating behavioral change over the course of the eight-month trial. This affirmation seems to be in line with other research. For instance, authors such as Stern (2002) and DeGroot and Steg (2008) suggest a relationship between behavior and one's personal values. DeGroot and Steg go on to specify three types of ethical values that impact environmental action: egocentric values (considering the costs and benefits of action in terms of personal well-being), altruistic values (considering the costs and benefits of action in terms of impact on other human beings), and biospheric values (considering the costs and benefits of action in terms of ecological or biospheric well-being). Our findings seem to echo those of other studies that show that personal values that are altruistic and biospheric lead to more environmental behavior (Stern & Dietz, 1994; Van Vugt, Meertens & Van Lange, 1995).

Finally, the reported competences associated with behavioral change in this study seemed to be facilitated by each family's underlying systemic dynamic. In other words, the families that successfully integrated mitigation behavior were those in which members interacted cooperatively, helped each other through challenges and underwent change as a family unit. We believe that certain concepts associated with systems theory apply when considering the family itself as a balanced open system (Salem, 2005, p.57). For example, we attribute the Landry and Pelletier families' successful passage from action to sustained behavioral change (Prochaska *et al*, 1992) in part to the construct of systemic optimal adaptability (Salem, 2005, p.62), whereby all family members may actively participate in the decision making process when faced with a destabilising situation (such as family-wide behavioural change). In the case of the Goguen family, we suggest that this system characteristic was absent or not sufficiently developed, thus contributing to that family's inability to reach the sustained behavior stage of the Prochaska *et al*. (1992) change model. As such, we submit that family dynamics represents a new influencing factor on climate change mitigation behavior in families.

Conclusions: Lessons learned

Firstly, it should be noted that our observations are derived from a relatively small number of cases. However, though our chosen methodology does not allow for generalization, we feel confident in hypothesising that families who hope to adopt mitigation behavior will have a better chance at success if their members share altruistic and biospheric values. Our findings are also in line with social cognitive theory, highlighting the importance of self-efficacy when attempting to adopt climate change mitigation behaviors in the family setting. Accordingly, we believe that families who successfully navigate the process of behavioral change do so by manifesting collective efficacy (Bandura, 1997) along with other collective competences such as collaboration, citizenship, self-regulation, perseverance and decision-making. Thirdly, our findings indicate that family dynamics seem to play an important role in successful behavioral change among members. It is our belief that a family is better equipped to undergo such change when it functions as a well-balanced adaptable system (Salem, 2005, p.62).

In light of these conclusions, we believe further study is warranted in the area of competences as they relate conceptually to the adoption of mitigation behavior. In other words, more research is needed in order to better understand how *collective competences*, skills manifested collectively among all members of a family, contribute to the integration of sustained mitigation behaviors. We also contend that the proposed conceptual constructs

of *shared family values* and *collaborative family dynamics* as an influencing factor on environmental action merits further study. We join Wolf (2011) in calling for more research on “ecological citizens’ value systems to explain their ... [higher levels of] engagement”, a suggestion that acknowledges all three of our proposed conceptual constructs when applied to families. Accordingly, given the inability of the Goguen family to integrate mitigation behaviors despite the father’s clear engagement to the process and knowledge as an environmentalist, we are curious as to the potential role of collective competences and collaborative system dynamics in the case of a family where an equally suitable father-figure is able to successfully foster sustained mitigation behaviors. Such a study would offer further insight as to how families can successfully change their daily habits and thus contribute to climate change mitigation at a local level.

In conclusion, we believe that our findings stand to play an important role in the development of any potential educational program aimed at facilitating a shift to a “greener” life for the average suburban family. Given our evidence for the conceptual constructs present in this study’s participating families, we contend that such educational programs should consider the following points in their design: (1) a preliminary stage in which common biospheric values are shared and established as guiding principles for the entire family throughout the process of change; (2) frequent opportunities to share ideas, review common goals and foster a sense of contribution and collaboration among all family members (potentially through group activities); and (3) periodic moments throughout the program where members can celebrate successes, thus reinforcing their perception of self-efficacy and contributing to collective efficacy within the family.

Finally, we believe that our research into collective sustainability behavior in the context of the family is in line with Environmental Education objectives such as fostering awareness of the environment and contributing to knowledge, values and competences that foster action, both individually and collectively, in response to environmental problems (UNESCO-UNEP, 1988, p.6). As such, our findings point to a need for more locally implemented policy initiatives where people are encouraged to rally together towards a common goal of climate change mitigation. For example, such policies could capitalize on the popularity of social networks by incorporate an experience sharing component (e.g. Twitter, Facebook), thus potentially mobilizing an entire community. According to Donner (2007), the most effective emissions policies to date have taken place at the community level. We need to bring back initiatives that blend education and action, similar to the now abolished *One Tonne Challenge* (in Canada), and strive to get people involved in their implementation at the local level.



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