

Chapter 15

Why Consumers Buy Green

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Abstract Increasingly, consumers are becoming more knowledgeable about the environment and reflecting this knowledge in their decisions to buy green products. While previous research on the topic has generally examined green consumption related to a single product label, numerous questions exist about why consumers choose various green products and services. We address these concerns by examining individuals' actual green consumption as it relates to their trust of various sources to provide them with environmental information, environmental knowledge, and personal affect towards the environment. These relationships are studied for a sample of more than 1,200 UK residents using multiple regression techniques. We show that individuals' total green consumption is related to their trust of various sources to provide them with environmental information, environmental knowledge, and personal affect towards the environment. These findings have important implications to policy-makers and businesses alike as greater efforts are made to encourage more widespread green consumption.

KEY WORDS: Green purchasing • Green consumerism • Green consumption • Trust • Environmental knowledge • Eco-label

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15.1 INTRODUCTION

Individuals worldwide are becoming increasingly savvy about the environment, and basing their purchasing decisions on a product's environmental attributes (Darnall, 2008; Perrini, Castaldo, Misani & Tencati, 2009). For instance, within the United States (US), approximately 15 percent of consumers routinely pay more for green products, and another 15 percent seek green products if they do not cost more (Ginsberg & Bloom, 2004). Similarly, consumers in Costa Rica are willing to pay price premiums of \$30 per night for hotel services that have certain eco-labels (Rivera, 2002). Consumers have also revealed a willingness to spend 20-50 percent more for organically labeled food (Barkley, 2002). In spite of their greater cost differentials, by the end of 2007 international sales of UK organic products climbed to €33.7 billion, which represents a 10% increase from the prior year (Perrini, Castaldo, Misani & Tencati, 2009). As a consequence, there is a compelling reason for governments and companies to understand more about why consumers buy green.

Previous research on the topic has generally examined green consumption related to a single product label. In particular, earlier scholarship has considered consumer purchasing decisions related to organic certified products (Perrini, Castaldo, Misani & Tencati, 2009; Loureiro, McCluskey & Mittelhammer, 2001), eco-labeled food (Loureiro, McCluskey & Mittelhammer, 2001), sustainable forest products (Teisl, Peavey, Newman, Buono & Hermann, 2002) and energy labeled electrical appliances (Sammer & Wüstenhagen, 2006; Mills & Schleich, 2009). These studies illustrate that there are numerous types of labels that might influence consumers' shopping decisions. However, as yet researchers have little sense regarding factors that are related to consumers' *overall* green consumption (Galarraga-Gallastegui, 2002).

Of the existing studies that have examined aspects of consumers' green consumption, prior scholarship has emphasized environmental knowledge and attitudes as important correlates (Schlegelmilch, Bohlen & Diamantopoulos, 1996). Other studies have focused on the socio-demographic aspects of consumers who buy green, albeit with mixed findings (Straughan & Roberts, 1999; McDonald & Oates, 2006). However, information is lacking regarding how different sources of environmental information may influence these decisions (McDonald & Oates, 2006; Schlegelmilch, Bohlen & Diamantopoulos, 1996), especially as it relates to consumer trust of these information sources. Moreover, much of the existing research is based on weak empirical examinations (Sammer & Wüstenhagen, 2006), small samples or restricted geographic scopes. As such, we have had limited ability to generalize the findings. This issue is particularly important since many more companies now market their products to other countries, and as such a more robust international examination is needed (Lee, 2008).

Understanding why consumers buy green is increasingly important to policy-makers. While market failures related to pollution can be addressed by regulating firms through coercive measures, coercive regulations have been limited within consumer markets (outside of product bans or taxes to curb consumer demand). However, government-sponsored eco-labels are one example of a regulatory tool that is being used with increasing popularity. Even if only a small portion of consumers uses the environmental information in making their product purchases, a small portion is all that is needed to encourage the broader population of firms to radically change their production decisions in an environmentally friendly way (Moorman, 1998). Moreover, if a majority of consumers shift towards

making green purchases, it is possible that *all firms* will make a switch towards green production (Eriksson, 2004). The societal benefits of this arrangement would be profound and largely infeasible using coercive regulations on their own (Eriksson, 2004). However, for government to encourage more widespread green consumption, policy makers must know what factors encourage consumers to buy green. This is especially true for consumers who are at the margin in that they presently do not buy green but may if presented with the right circumstances.

We address these concerns by examining individuals' green consumption as it relates to their trust of environmental information sources, environmental knowledge, and personal affect towards the environment. These relationships are studied for a sample of more than 1,200 residents living in England, Wales, and Scotland using multiple regression estimation techniques that control for numerous confounding concerns.

15.2. UNDERSTANDING GREEN CONSUMERISM

Green consumption is the purchasing and non-purchasing decisions made by consumers, based at least partly on environmental criteria (Peattie, 1995). In general, green consumption stems from individuals' idealism to internalize some of the negative externalities from the production of the green goods they buy (Eriksson, 2004).

Green consumerism has roots in the 1970's when public concern for the environment became mainstream (Vazquez & Liston-Heyes, 2008), as did the notion that government should take the lead in mitigating specific environmental problems. However, in the late 1980s and early 1990s, a new 'green thinking' emerged (Dryzek, 1997). Green thinking advocates argued that most environmental problems were borne from the prevailing socio-economic systems of production and consumption. Remedying environmental problems therefore required a broader emphasis on changing these socio-economic systems (Dryzek, 1997) rather than simply focusing on government policies towards specific environmental problems. Fueling this individual-focused consciousness were popular publications, such as *The Green Consumer Guide* (Elkington & Hailes, 1988), which laid the foundation for debates about eco-labeling in Europe, and encouraged a greater emphasis on green consumerism during the 1990s (Jordan, Wurzel, Zito & Brückner, 2004).

Green consumerism often is viewed as a business opportunity. Customer surveys show that about 44 percent of customers report their willingness to pay a premium price for green products (Chattaway, 2008). For instance, consumers have revealed a willingness to spend 20-50 percent more for hotel services (Rivera, 2002) and organically labeled food (Barkley, 2002). In the decade from 1985 to 1995 the percentage of green products as a percentage of total new products increased from 0.5% to 9.2% (Min & Galle, 1997). These increases are holding strong in that by the end of 2007 international sales of UK organic products were increasing at a rate of 10% increase per year (Perrini, Castaldo, Misani & Tencati, 2009). At the same time, more firms have been developing products and marketing strategies aimed at the green thinking consumer (Peattie, 1992). For firms that are committed to developing these products, they can also benefit by enhancing their social legitimacy. They can also improve their intangible value related to developing an eco-friendly reputation, enhance their relations with environmental regulators, and bolster their community standing (Darnall,

2008). Together, these activities can improve a company's long-term survival and competitiveness. Moreover, some scholars believe corporate distrust is also an issue (Lee, 2008). While customer surveys have reported increasing levels of consumer awareness for environmental concerns (Peattie & Crane, 2005), reliable information about corporate environmental activities is limited, which hinders consumers from buying green. Customer skepticism of firms' green production and product claims has also been increasing (Peattie & Crane, 2005; Harris, 2007; Bamberg & Moser, 2006; Thøgersen, 2000; Garnkvist., Lekedal and Marmendal , 2007; Moisander, 2007).¹ The distrust is warranted. For instance, within the US during the early 1990s, approximately half of the environmental advertising has been considered misleading or deceptive (Kangun, Carlson & Grove, 1991). The amount of deceptive environmental advertising is expected to be greater today given society's burgeoning interest in environmental issues and the proliferation of unverifiable environmental information. This concern has led the US Federal Trade Commission (FTC) to fast-track review of its 1998 regulations on green marketing. The FTC sees the largely unregulated area of "green advertising" as a primary target for consumer deception (Bastile & Skierka, 2008).

These concerns suggest that while green consumption and the green thinking movement may be viable pathways towards achieving widespread environmental improvements, they may need to be accompanied by a variety complementary efforts, such as enhancing government incentives for both green consumption (Autio, Heiskanen & Heinonen, 2009; Darnall, 2008) and production (Eriksson, 2008; Darnall, 2008), and stronger regulatory oversight regarding advertising claims. To address this latter concern, in the early 2000s the EU initiated an information campaign to guide customers in the acquisition of low-energy consumption products (Rex & Bauman, 2007). In the UK, government education efforts occurred due to pressure from a variety of groups (e.g., Friends for the Earth and the National Consumer Council) that were expressing greater concern about the greater need to address climate change (Young, Hwang, McDonald & Oates, 2010). Additionally, governments and non-government organizations (NGOs) worldwide are taking a more prominent role in terms of regulation and standardization of corporate claims (Rex & Baumann, 2007).

15.3 PREDICTING GREEN CONSUMPTION

There are numerous examples of green consumerism, we examine an individuals' total green consumption. To adequately understand an individual's total green consumerism, each consumer's behavior must be viewed as a series of purchase decisions (Peattie, 1999). These decisions may be inter-related and underpinned by common values or they may be unconnected and situational (Peattie, 1999). There are no agreed criteria for what is green consumption or a green product (Young, Hwang, McDonald & Oates, 2010). However, prior studies and general logic serve as a guide. In general, green products include choosing organic meat, organic dairy products (milk/cheese/yoghurt), organic vegetables (Beckmann, 2001), fair trade products (Galarraga-Gallastegui & Markandya, 2000). Additionally, green purchasing decisions can involve buying locally grown food or products that were produced locally, choosing unpacked fruit and vegetables, and avoiding buying food that is not in season. Related to household products, green consumption includes purchasing, recycled toilet

¹ Skepticism does not necessarily stem from false claims. Peattie and Crane (2005) identified 5 main bad marketing practices leading to customers distrust: PR used to discredit environmental criticisms; adding green claims to existing products to increase sales; being eco-friendly only when it leads to cost savings; creating new green products that are not wanted by customers and claiming green credentials while not doing more than complying with existing regulation.

paper, energy efficient light bulbs (Defra, 2002), natural cleaning products, recycled stationery, sustainable clothing (i.e., organic cotton or hemp). It also might involve purchasing more durable products that optimize energy efficiency of electrical products and appliances. Together, these examples illustrate the numerous purchasing and non-purchasing decisions that comprise an individual's total green consumption.

In considering the factors related green consumption, we consider consumers' trust of sources to provide information about environmental concerns, and consumers' environmental knowledge and personal affect towards the environment. Each is discussed further below.

15.3.1 Trust of Sources Provide Information about Environmental Concerns

Trust is defined as an individual's intention to accept vulnerability based upon positive expectations of the intentions of the behavior of another (Rousseau, Sitkin, Burt & Camero, 1998) individual or entity. Trust allows for risk-taking in a relationship (Mayer, Davis & Schoorman, 1995), and is needed especially where other control systems (Schoorman, Mayer & Davis, 2007) or regulations are lacking. In this context, trust is especially relevant, as regulatory oversight governing informational claims is generally weak (Bastile & Skierka, 2008). However, as yet, little is known about how different environmental information sources may influence consumer decisions (McDonald & Oates, 2006; Schlegelmilch *et al.*, 1996), especially as it relates to consumer trust of these sources.² We anticipate that consumers will respond differently to environmental information sources based on the trust they have of those sources.

Among other sources, consumers receive environmental information from government, environmental NGOs, scientists, and personal connections with friends and family. In considering government as a source of environmental information, it is the primary entity responsible for protecting the global environmental commons, establishing environmental laws, and seeing that the environment is protected. Government is also tasked with protecting customers from false market claims, establishing guidelines for product labels and acceptable marketing claims, and for undertaking legal action against companies that fail to comply with established guidelines (Rex & Baumann, 2007). Outside of coercive regulations and enforcement, government has taken a lead role in creating eco-labels and providing consumers with environmental information about the merits of environmental labels and green consumption in general. Some scholars have suggested that government sponsorship and oversight of eco-labels has increased their consumer appeal (Ottman, Stafford & Hartman CL, 2006; Harris, 2007). For these reasons, we posit that consumers who trust the environmental information put forward by government are more likely to buy green.

² While environmental consciousness can impact consumers' purchasing decisions, questions remain about how sources of information play a role (Schlegelmilch *et al.*, 1996). Information sources are particularly relevant in that while a growing number of consumers may be aware of the environmental impacts of their shopping choices, and showing interest in understanding how to choose more environmentally friendly items (Maciag & Hepting, 2008), many customers still find difficult to buy green products. It is believed, however, that these same consumers may be more likely to purchase environmentally friendly products if trusted information sources were available (Young, Hwang, McDonald & Oates, 2010; Knott, Muers & Aldridge, 2008).

Like government, environmental NGOs help protect customers from false market claims by developing eco-labels and eco-label guidelines (Rex & Baumann, 2007). Environmental NGOs also are more likely to protest publicly against labels that fall short of environmental expectations (Rivera & de Leon, 2004), and this scrutinizing role has also increased consumers' overall appeal towards green products (Ottman *et al.*, 2006; Harris, 2007). It also has increased the legitimacy of eco-labels that are sponsored by environmental NGOs (Banerjee & Solomon 2003; Knott, Muers & Aldridge, 2008; Scammon & Mayer, 1993, 1995). As a consequence, consumers who trust the environmental information put forward by environmental NGOs are anticipated to be more likely to buy green.

Scientists are one of society's primary sources of environmental information. They are the originators of independent studies that speak to the condition of the environment and to global climate change. For instance, the Intergovernmental Panel on Climate Change has released four highly publicized reports on global climate change and received the 2007 Nobel Peace Prize for its efforts to build up and disseminate greater knowledge about man-made climate change, and to lay the foundations for the measures that are needed to counteract such change (IPCC, 2010). Because of their credentials, scientists can have a significant impact on societal perceptions. For these reasons, we anticipate that consumers who trust the environmental information put forward by scientists are more likely to buy green.

Friends and relatives are the most trusted individuals in our social networks. To the extent that these individuals possess environmental information, they can have significant bearing on consumers' decisions to buy green. Indeed, friends and family are reported as the most trusted sources of purchasing information source for buying green (Oates, McDonald, Alevizou, Hwang, Young & McMorland, 2008; Lee 2008; Young *et al.*, 2007). For these reasons, we posit that consumers with greater trust of government, environmental nonprofits, and friends/family, and scientists to provide environmental concerns information are more likely to buy green.

Hypothesis 1: *Consumers with greater trust of government, environmental nonprofits, and friends/family, and scientists to provide environmental concerns information are more likely to buy green.*

Private business is also a source of environmental information. However, environmentally conscious customers often report ignoring green advertising claims (Oates *et al.*, 2008) or feeling confused about the environmental claims used by firms (Mayer, Scammon and Zick, 1993). These consumers report their distrust of firms' own eco-labels because they 'did not tell the whole story' (Oates *et al.*, 2008), made false claims (Banerjee & Soloman, 2003), exaggerated messages, or lacked clear meaning (Fay, 1992; Carlson, Grove and Kangun., 1993; Scammon & Mayer, 1995). Corporate messages such as these are referred to as "greenwashing," or the practice of companies disingenuously presenting their products and policies as being environmentally friendly.

The root of corporate greenwashing rests in whether profit-seeking organizations have sufficient market incentives to voluntarily incur additional private costs to protect the environment (Darnall, Potoski & Prakash, 2010). In the absence of sufficient incentives, private business may symbolically change their products to create the public perception that they are green, rather than radically changing their production processes to create truly green products. In so doing, corporate

greenwashers can derive an economic benefit by producing false claims about the greenness of their products. Such actions increase consumer distrust of *all* green products, reduces consumers' willingness to buy green (Peattie & Crane, 2005), and creates barriers toward encouraging broader societal change (Knott, Muers & Aldridge, 2008). For these reasons, it is our belief that individuals who distrust private firms' environmental information do not pay attention to their marketing claims.

Hypothesis 2: Consumers with greater distrust of private business to provide environmental concerns information are no more likely to buy green.

15.3.2 Role of Environmental Knowledge

Prior research examining the factors related to green purchasing assert that an individual's ecological behavior is highly dependent upon his/her knowledge of the relevant environmental issues (Young, Hwang, McDonald & Oates, 2010; Chan, 2001; Moisander, 2007; Oates *et al* , 2008; Bamberg & Moser, 2007). The broader literature reports a positive relationship between knowledge and behavior (e.g., Hoch & Deighton, 1989; Park, Mothersbaugh, & Feick, 1994). However, related to environmental research, this relationship is not as consistent (Martin & Simintiras, 1995). For instance, Chan (1999) notes that some studies have found a positive association between ecological knowledge and environmentally responsible behavior (Dispoto, 1977; Kilkeary, 1975; Hines, Hungerford, & Tomera, 1986/87), while others have shown that no significant relationship (Arbuthnot & Lingg, 1975; Geller, 1981; Schahn & Holzer, 1990). Such mixed empirical findings may suggest a more complex relationship between ecological knowledge and behavior (Chan, 1999).³

Consumers' environmental knowledge influences their behavior in several different ways. First, knowledge serves as a personal resource to make decisions and as a driver of personal responsibility (Moisander, 2007). Additionally, knowledge influences what individuals view is within their behavioral control (Bamberg & Moser, 2007). It affects both motivation and ability to act in an environmentally friendly way (Bamberg & Moser, 2007; Moisander, 2007). For these reasons, we posit that individuals who have knowledge of critical environmental issues are more likely to buy green. In particular, we consider two types of environmental knowledge—general knowledge and action based knowledge.

General knowledge relates to consumers' rudimentary understanding of environmental issues. It involves a general awareness of basic terminology and concepts. Consumers lacking general knowledge find it more difficult to understand environmental information whereas more knowledgeable consumers can more readily digest a wide range of environmental information. Environmentally knowledgeable consumers therefore can make more rapid decisions that translate into action (Moisander, 2007).

³ A general criticism of this work is that it is based on relatively unsophisticated empirical examinations, small samples (Sammer & Wüstenhagen, 2006) or limited geographic scopes. As such, they are limited in their ability to offer generalizable findings. Generalizability of the results is particularly important since many more companies now market their products to other countries, and as such a more robust examination across multiple boundaries is needed (Lee, 2008).

By contrast, action-based knowledge relates to consumers' understanding of the activities required to *mitigate* environmental problems. It includes an awareness of consequences of individuals' actions on the environment and awareness of the remedies that can improve behavior (Hines *et al.*, 1987) Action-based knowledge is not only a personal resource, but it also influences consumers' sense of personal responsibility for green behaviors. That is, if a person is aware of the consequences of their behavior, an ascription of personal responsibility typically follows. For these reasons we hypothesize that consumers with greater general and action-based knowledge related to environmental concerns are more likely to buy green.

Hypothesis 3: Consumers with greater general and action-based knowledge related to environmental concerns are more likely to buy green.

15.3.3 Personal Affect towards the Environment

Other factors associated with why consumers buy green relate to consumers' personal affect towards critical environmental issues. A consumer's personal affect refers to the emotional state elicited from a particular issue. Related to the environment, personal affect relates to a consumer's emotional state related to environmental concerns.⁴ We suggest that a consumer's sense of personal risk and empowerment to address critical environmental problems are particularly salient personal affects related to green consumption.

Sense of personal risk relates to the perceived individual harm that may arise from a future environmental event. Individuals who feel that there is a personal risk related to the environmental problems are more likely to be aware of the consequences of their individual behaviors (Vining & Ebreo, 2002). These relationships have been examined in other environmental applications, and show that they predict pro-environmental behaviors related to recycling (Hopper & Nielsen, 1991; Vining & Ebreo, 1991, 1992), household energy saving (Black, Stern & Elworth, 1995) and reduced private car use (Bamberg & Schmidt, 2003). We believe that they also relate to consumers' decisions to buy green.

Sense of empowerment refers to whether or not an individual is confident that his/her personal actions have bearing on a critical environmental issue. Individuals with a higher sense of behavioral control tend see change as something they can actively manage whereas individuals who have a low sense of behavioral control see it as somehow random or reserved for more influential people (Fransson & Garling, 1999). Related to the natural environment, individuals who have a stronger sense of empowerment towards environmental concerns may be more likely act to mitigate those concerns. For these reasons we hypothesize that consumers with greater personal affect related to

⁴ Related scholarship has considered how moral responsibility applies to environmental behavior, especially in terms of whether a person feels they cause the problem (Kaiser & Shimoda, 1999). This research suggests that 55% of a person's ecological behavior can be explained by what they term, a responsibility judgment (Kaiser & Shimoda, 1999). However, personal affect differs from responsibility in that the latter implies a perceived moral commitment or expectation to address the concern, whereas the former refers to a more general state of concern in the absence of obligation.

environmental concerns are more likely to buy green.

Hypothesis 4: Consumers with greater personal affect related to environmental concerns are more likely to buy green.

15.4 METHODS

To evaluate our hypotheses, we relied on data collected from an online survey that was co-developed and administered by the Centre for Business Relationships, Accountability, Sustainability and Society (BRASS) at Cardiff University and The Future Foundation, a consumer insight and strategic futures company. The survey asked UK consumers about their consumption behavior, perceptions about climate change, and trust of different societal sources.

At the time of the survey, approximately 60 million individuals live within the UK. The sample was limited to consumers who had internet access. These consumers accounted for 63% of the population (approximately 38 million residents). *Research Now*, a nationally recognized UK market research firm, was enlisted to help finalize the sample. To ensure that the sample was representative, Research Now stratified UK residents by gender, age, household income, terminal education age, region, postcode, car ownership, and household tenure, personal income, working status, number of adults in the household and number of children. The resulting sample consisted of approximately 400,000 UK consumers, who were then randomly sampled.

In September 2007, a total of 1,513 consumers were surveyed online. Prior to its finalization, the survey was vetted among several leading scholars in the field of green consumerism. *Research Now* offered respondents a financial incentive for the completion of the surveys, which ensured a relatively high response rate. A total of 1,278 (84.5%) individuals within the sample completed the survey in its entirety.

To check for common method variance, we relied on the post-hoc Harman's single-factor test (Podsakoff & Organ, 1986). This test assumes that if a substantial amount of common method variance is present, a factor analysis of all the data will result in a single factor accounting for the majority of the covariance in the independent and dependent variables. The results of Harman's single-factor test revealed that no single factor accounted for the majority of the variance in the variables, offering evidence that this type bias was not a concern.

Social desirability bias was addressed by ensuring respondent anonymity. Anonymity assurances reduce bias even when responses relate to sensitive business topics. To further address potential problems related to social desirability bias, survey questions related to consumers' green purchasing behavior were separated from questions pertaining to environmental perceptions and education, in addition to questions related to institutional trust. In instances where a social desirability bias exists, researchers are less likely to identify statistically significant relationships because there is less variability in respondents' survey answers. However, by finding statistical significance, additional

evidence would be offered about the strength of the relationship between the variables of interest (Hardin & Hilbe, 2001). Non-response bias was less of a concern because of the survey's high response rate.

15.4.1 Measures

Dependent Variable—For the purposes of this study, *total green consumption* accounted for the extent of consumers' overall green consumption related to food and household products. More specifically, consumers were asked "Which of the following do you do nowadays when shopping for food?" Consumers reported on 8 different purchasing behaviors: choosing organic meat, choosing organic dairy products (milk/cheese/yoghurt), choosing organic vegetables, choosing fair trade, choosing locally grown food, avoiding buying products that have traveled a long way, choosing unpacked fruit and vegetables, and avoiding buying food that is not in season in the UK. Additionally, consumers were asked "Which of the following do you do nowadays when shopping for non-food?" Consumers reported on 6 different purchasing behaviors: choosing and using 'green'/natural cleaning products, choosing recycled toilet paper, choosing recycled stationery, choosing energy efficient light bulbs over tungsten/other bulbs, choosing sustainable clothing (i.e., organic cotton or hemp), and looking for optimum energy efficiency when buying electrical products/appliances. For each of these 14 behaviors, respondents reported "Always"=3, "Often"=2, "Occasionally"=1, or "Never"=0. The responses of the 14 consumer purchasing behaviors were summed to arrive at a respondent's overall green consumption index, which accounted for both the frequency and breadth of an individual's green consumption, and had a minimum possible value of 0 and a maximum of 42.

Independent Variables - We relied on three sets of independent variables that accounted for respondents' trust in sources to provide environmental information, personal knowledge about environmental information and, personal affect towards the environment. We elected to use climate change as our environmental application because it is a critical environmental problem affecting the global environment (IPCC, 2010), and has received significant media attention in recent years.

To measure respondents' trust of government, environmental NGOs, scientists, friends/family and private sector companies to provide information related to climate change. Related to trust of government sources, respondents were asked "How much do you trust your local authority, UK government, and the European Commission, to provide you with information on climate change." For each government entity, respondents indicated "No trust at all"=1, "Little trust"=2, "Neither"=3, "Trust a little"=4, "Trust wholly"=5. The three government variables were entered into a common factor analysis. One factor emerged to account for government trust, as seen in Table 15.1. To measure respondents' trust of environmental NGOs, friends/family, private sector companies, and scientists, respondents were asked "How much do you trust the following entities to provide you with information on climate change." For each entity, respondents indicated "No trust at all"=1, "Little trust"=2, "Neither"=3, "Trust a little"=4, "Trust wholly"=5.

—INSERT TABLE 15.1 ABOUT HERE—

The second set of independent variables measured respondents' personal knowledge about climate change, we considered respondents' general and action-based knowledge. General knowledge relates to respondents' understanding of climate change terminology, whereas action-based knowledge relates to respondents' understanding of the activities that reduce climate change. To measure both

types of knowledge we relied on one survey question that asked: “How familiar are you with each of the following terms.” The general knowledge terms related to “climate change” and “carbon or CO2 emissions,” whereas action-knowledge terms related to “carbon offsetting” and “carbon labeling.” Respondents indicated whether for each of these items they “Have never heard of it”=1, “Have heard of it but don’t know anything about it”=2, “Know a little about it”=3, “Know a fair amount about it”=4, “Know a lot about it”=5. The four knowledge variables were entered into a common factor analysis. The results were consistent with our expectations in that two factors emerged to account for our two types of climate knowledge: general knowledge and action-based knowledge, as seen in Table 15.2.

—INSERT TABLE 15.2 ABOUT HERE—

The third set of independent variables measured respondents’ personal affect towards climate change. To assess respondents’ sense of personal risk related to climate change, we relied on a survey question that asked “To what extent do you feel that you will be personally affected by climate change?” Respondents indicated whether they thought “I don’t feel worried as I don’t believe climate change is happening”=1, “climate change is not happening yet, but my grandchildren will experience the effects of it in their lifetime”=2, “climate change is not happening yet, and I don’t think I will see the effects of it in my lifetime”=3, “climate change is not happening yet, but I think I will see the effects of it in my lifetime”=4, “I do feel at risk from climate change: it is happening now and we should do more to prevent it”=5. To measure consumers’ sense of empowerment about climate change, we relied on one question that asked respondents, “Please indicate the whether you agree or disagree with each of the following statements.” Respondents were presented with the following two declarations: “There is no point in trying to reduce emissions at an individual level,” and “I don’t see why I should take action on climate change if other people are not.” Respondents indicated whether for each of these statements that they “Strongly disagreed” =1 “Somewhat disagreed”=2, “neither agreed nor disagreed”=3, “Somewhat agreed”=4, “Strongly agreed”=5. The two empowerment variables were entered into a common factor analysis. As anticipated, one factor emerged to account for empowerment, as seen in Table 15.3.

—INSERT TABLE 15.3 ABOUT HERE—

Control Variables – Because the context of the consumption decision is important (Hand, Shove and Southerton., 2007), several control variables were included. Since scholars have argued that more educated individuals, on average, place more importance on eco-information and are more likely to trust eco-labels (Noblet, Teisl & Rubin, 2006) we controlled for consumers’ education. Additionally, we controlled for the number of children respondents had at home, as environmental concern tends to increase in homes with children. Since social consciousness tends to increase with income (Huang, Kan & Fu, 1999), we added a control variable to account for consumers’ household income. Additionally, we controlled for respondents’ gender, as women tend to be more socially conscious (Huang 1993; Laroche, Bergeron & Barbaro-Forleo, 2001; Virden & Walker, 1999). Finally, we controlled for respondent’s age (Anderson & Cunningham, 1972; Lee, 2008) and country of residence, such that England was the excluded country variable.⁵

⁵ It is important to note that in studying consumers’ green purchases, no demographic variable is without controversy. For instance, van Kemp *et al.* (2009) found empirical evidence that low income consumers may be ready to make pro-ethical choices in the market place, in part because more options are available. Other studies have

15.4.2 Empirical Models

Table 15.4 includes descriptive statistics and correlations for all variables. It indicates that while correlations among our non-interacted explanatory variables were within the range of acceptability in that they were less than .80 (Kennedy, 2003). We also evaluated the variance inflation factors (VIF) for each of our explanatory variables. The results revealed the highest VIF was 1.92, which was well below Kennedy's (2003) maximum acceptable threshold of 10.0 indicating that multicollinearity was not a concern. We used linear regression to evaluate our model, with robust errors. Statistical analyses were performed using Stata 9.2.

—INSERT TABLE 15.4 ABOUT HERE—

15.5 RESULTS

The results of each of our estimations (see Table 15.5) show that the likelihood ratio test statistics were significant at $p < 0.01$, indicating that the null effect of the independent variables could be rejected. The R-square for our model was .2472, suggesting a reasonable model fit.

—INSERT TABLE 15.5 ABOUT HERE—

In examining the relationship between consumers' trust in different entities to provide climate change information and their increase in total green consumption, government trust was positive and statistically significant ($p < .05$), as was environmental groups ($p < .01$). Combined, these results offer some evidence in support of Hypothesis 1. However, consumers' having *less* trust in scientists to provide information about climate change was associated with greater total green consumption ($p < .01$), and there was no statistically significant relationship with friends and family.

Our results also showed that individuals who distrusted private business were no more likely to increase their total green consumption. These results offer support for Hypothesis 2. Additionally, our results showed a significant relationship between consumers' personal knowledge and buying green. More specifically, respondents' general and action-based knowledge of climate change were associated with greater amounts of total green consumption ($p < .01$). Combined, these findings offer evidence in support of Hypothesis 3, which states that consumers with greater knowledge related to climate change are more likely to buy green.

found that education, gender, age, and country of origin had no statistical relationship with green purchasing (Marcard & Truffer, 2004). Similarly, Oates *et al.*, (2008) report that demographic variables have inconclusive results in predicting green consumption. However, because of the mixed and inconclusive findings, we have included the most widely recognized demographic variables in our statistical models.

Finally, consumers' personal affect about climate change was related with their total green consumption. That is, consumers' sense of personal risk related to climate change ($p < .01$), in addition to their sense of personal empowerment to address climate change ($p < .01$), were both positively related with green consumption. These findings support Hypothesis 4, which suggests that consumers with greater personal affect related to climate change are more likely to buy green.

Related to our control variables, women were more likely ($p < .01$) to buy green, as were older consumers ($p < .01$). Additionally, higher education levels were related ($p < .05$) to greater overall green consumption, as were consumers that resided in Wales as compared to England ($p < .01$).

15.6 DISCUSSION AND CONCLUSIONS

While consumers are becoming more knowledgeable about the environment and reflecting this knowledge in their decisions to buy green products, previous research highlights how little we know about the reasons why consumers chose to buy green. Since earlier scholarship has generally examined green consumption related to a single product label (Perrini, Castaldo, Misani & Tencati, 2009; Loureiro, McCluskey & Mittelhammer, 2001; Loureiro, McCluskey & Mittelhammer, 2001; Teisl, Peavey, Newman, Buono & Hermann, 2002; Sammer & Wüstenhagen, 2006; Mills & Schleich, 2009), numerous questions exist about why consumers buy green across a variety of products and services (Galarraga-Gallastegui, 2002).

This study advances our knowledge on the topic by examining individuals' total green consumption as it relates to their trust of various sources to provide them with environmental information, environmental knowledge, and personal affect towards the environment. In particular, we examine claims that sources of environmental information are critical to understanding green consumption because consumption may increase if trusted information sources were available (Young, Hwang, McDonald & Oates, 2010; Knott, Muers & Aldridge, 2008). Our results offer support for this notion in that we found evidence that consumers who have greater trust of government and environmental NGOs are more likely to increase their total green consumption.

By contrast, consumers who had *less* trust of private business to provide environmental information were no more likely to increase their total green consumption. This relationship exists, we believe because of skepticism about the motives of private business to market their green products. At issue is that private business may derive an economic benefit by symbolically changing their products to create the public perception that they are green, rather than radically changing their production processes to create truly green products. As such, consumers appear to pay little attention to their green marketing messages.

These findings have important implications to public policy and environmental NGOs in that a growing number of consumers are showing interest in understanding how to choose more environmentally friendly items (Maciag & Hepting, 2008), but finding it difficult to translate this interest into action. Our findings indicate a strong relationship between consumers who trust government and environmental NGOs to provide environmental information and their green consumption. These results suggest the importance of providing information to the public about

environmental matters and educating them about eco-labels. Additionally, these findings point to the value of government and environmental NGOs gaining consumer confidence in their ability to provide accurate environmental information. Related to government efforts, greater consumer credibility may be achieved by providing stronger guidelines regarding environmental advertising claims, and stronger regulation of such claims in an effort to prevent a green washing (Young, Hwang, McDonald & Oates, 2010). Doing so may encourage more widespread green consumption. This issue is particularly important because a small proportion of consumers who use environmental information in making their product purchases can go a long way towards encouraging the broader population of firms to change their production decisions in an environmentally friendly way (Moorman, 1998), and the societal benefits of such a shift could be profound.

Related to private business, our findings indicate that its self-promoted environmental claims are largely impotent. That is, the environmental information put forward by private business has no meaningful effect on these consumers' product purchases. As such, eco-friendly business may benefit to a greater extent by relying on eco-labels to market their green products rather than self-promotion. Additionally, since consumers that trust government and environmental NGOs are more likely to buy green, businesses developing green products may benefit to a greater extent by partnering with these entities to advance their green strategies and products. Doing so may enhance the overall social legitimacy of their green approach.

These notions relate to our second set of findings—that personal knowledge about environmental matters is related with more green consumption. Such knowledge can be general in nature, in that it relates to a rudimentary awareness of basic terminology and concepts. However, knowledge that is action-based knowledge, in that it relates to consumers' understanding of the activities required to mitigate environmental problems, is more strongly related to overall green consumption. Additionally, consumers who have a stronger sense of personal risk regarding the environment and a sense of empowerment to mitigate it are likely to buy more green products. Combined, these findings point to the importance of environmental education. To see a widespread change in consumer behavior, consumers likely require more information about environmental problems, how these problems are mitigated. Consumers also need more information about how they are personally connected to mitigation efforts. Our results further suggest that government and environmental NGOs would be more successful at undertaking these education efforts. In addition to typical educational approaches of informing the public through written materials, one novel education approach that may be particularly successful is rely on peer leaders. Since friends/family were more likely to influence eco-label users and potential eco-label users, relying on peer leaders within communities to educate their networks may be useful at increasing consumer knowledge about their environment and how they can act to reduce their impact.

In sum, while internationally consumers are becoming more savvy about the environment and increasing their consumption of environmentally friendly products (Darnall, 2008; Perrini, Castaldo, Misani & Tencati, 2009), many questions have remained about why individuals buy green. Utilizing multiple regression methodology for a large sample of UK residents, this research offers broader generalizations regarding consumers' overall green consumption. We show that individuals' green consumption is related to their trust of various sources to provide them with environmental information, environmental knowledge, and personal affect towards the environment. These findings have important implications about future scholarship, policy-makers, and private business alike as greater efforts are made to encourage more widespread green consumption.

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Table 15.1: Government trust factor analysis ^a

Government Trust to Provide Climate Change Information — “How much do you trust the following entities to provide you with information on climate change ...”	Factor Loading
Local authorities	0.650
UK government	0.890
European commission	0.824
Alpha Coefficient	0.846

^a Loadings stronger than ± 0.50 are bolded.

Table 15.2: Climate change knowledge factor analysis ^a

Climate Change Knowledge— “How familiar are you with each of the following terms...”	Factor Loadings	
	General Knowledge	Action-based Knowledge
Climate change	0.854	-0.157
Carbon or CO2 emissions	0.853	0.195
Carbon offsetting	0.406	0.663
Carbon labeling	0.274	0.642
Alpha Coefficients	0.922	0.779

^a Loadings stronger than ± 0.50 are bolded.

Table 15.3: Sense of empowerment factor analysis

Sense of Empowerment about Climate Change — “Please indicate the whether you agree or disagree with each of the following statements...”	Factor Loading
There is no point in trying to reduce emissions at an individual level	0.640
I don’t see why I should take action on climate change if other people are not	0.643
Alpha Coefficient	0.697

Table 15.4: Correlations* and descriptive statistics

	(1)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)	(17)	(18)	(20)
(1) Total green consumption	1.00																	
(2) General knowledge	.173	1.00																
(3) Action-based knowledge	.262	.265	1.00															
(4) Risk	.260	.122	.002	1.00														
(5) Sense of empowerment	.281	.227	.087	.317	1.00													
(6) Trust of government info.	.116	.042	-.046	.233	.250	1.00												
(7) Trust of NGO information	.208	.087	-.082	.373	.348	.421	1.00											
(8) Trust of priv. business info.	.010	-.106	-.017	.071	-.034	.481	.197	1.00										
(9) Trust of scientific info.	.049	.170	-.004	.225	.265	.438	.524	.260	1.00									
(10) Trust of family/friend info.	.098	.031	-.044	.171	.128	.180	.287	.176	.175	1.00								
(11) Gender	.136	-.086	-.155	.148	.088	.087	.192	.083	.057	.103	1.00							
(12) Age	.091	.086	.072	-.041	.042	-.104	-.023	-.098	-.057	-.110	-.040	1.00						
(13) Education	.099	.168	.209	.016	.106	.045	-.033	-.092	.068	-.073	-.124	-.029	1.00					
(14) Household income	-.011	.089	.115	-.015	.042	.054	-.049	-.011	.041	-.042	-.156	-.098	.283	1.00				
(15) Number of kids at home	-.003	-.066	-.055	.061	.019	.035	.055	.034	.031	.120	.090	-.348	-.099	.018	1.00			
(16) Wales	.052	-.039	.002	.019	.008	.014	.021	.022	-.007	.008	.039	-.060	.003	-.022	.078	1.00		
(17) Scotland	.005	-.015	-.006	.003	.030	.053	.000	-.041	.001	-.038	.005	.109	.067	.016	-.054	-.069	1.00	
(18) England	-.035	.040	.003	-.016	-.029	-.052	-.013	.019	.005	.026	-.028	-.050	-.054	.002	-.007	-.601	-.752	1.00
Mean	17.28	0	0	2.69	0	0	3.34	2.37	3.50	3.31	1.53	45.09	2.83	3.70	1.69	0.05	0.08	0.87
Standard deviation	7.13	0.89	0.74	2.06	0.73	0.92	1.13	0.96	0.99	0.959	0.5	16.13	1.20	2.09	1.06	0.22	0.27	0.34
Min	0	-3.06	-1.83	1	-2.01	-1.55	1	1	1	1	1	16	1	1	1	0	0	0
Max	42	1.77	1.49	6	0.92	1.92	5	5	5	5	2	75	4	11	7	1	1	1
N	1513	1513	1513	1513	1513	1513	1513	1513	1513	1513	1513	1513	1513	1513	1513	1513	1513	1513

* Correlations above ± 0.051 are statistically significant at $p < .05$.

Table 15.5: Factors related to consumers' green consumption[†]

Variable	Total Green Consumption	
	Coef.	SE
Trust of sources to provide information		
Government	0.469**	0.231
Environmental groups	0.824***	0.206
Scientists	-0.879***	0.215
Friends/family	0.275	0.203
Private business	-0.075	0.210
Personal knowledge		
General climate change knowledge	0.580***	0.222
Action-based climate change knowledge	2.478***	0.249
Personal affect		
Sense of personal risk related to climate change	0.554***	0.083
Sense of empowerment to address climate change	1.473***	0.290
Controls		
Gender	1.937***	0.379
Age	0.039***	0.012
Education	0.343**	0.160
Household income	-0.097	0.090
Number of kids at home	0.090	0.163
Wales	0.884	0.838
Scotland	0.013	0.564
Constant	12.661***	1.549
N	1,278	
F (17, N)	362.93***	
R-squared	.2472	

[†] Model was estimated using linear regression with robust errors; excluded country dummy variable is England
*** p < 0.01, ** p < 0.05, * p < 0.10