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EXAMINING NARRATIVE PERSUASIVE MESSAGES FOR HYBRID VEHICLES

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ABSTRACT

Because of their environmentally beneficial features, hybrid vehicles have gained popularity in the U.S. automotive market. Consumer-marketing research has investigated consumer characteristics for green-products as well as alternative fuel vehicles. The current study tests different types of messages (narrative vs. statistical) and message content characteristics (fuel economy vs. environmental impact) to investigate which type of message would generate more positive attitudes and greater purchase intent of hybrid vehicles.

Results indicate statistical messages may generate more positive attitudes and greater purchase intent towards hybrid vehicles than narratives, and suggest participants are more interested in the environmental impact of hybrid vehicles than their fuel economy.

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Chapter 1

Introduction

The current study investigates potential marketing strategies of hybrid vehicles. Given the different ways environmentally friendly vehicles may be promoted, what types of messages might work best? Is it more effective to appeal to the ecological benefits of hybrid vehicles or their cost efficiency? Do appeals based on stories,or those based on statistics work best? This thesis will explore these questions.

This chapter discusses the background of alternative-fuel vehicles supported by the U.S. Department of Energy (D.O.E.) and the student competition series of EcoCAR to provide the history and background needed to understand hybrid vehicles.

Beginning with the introduction of the Toyota Prius in 1997, automakers have produced and released alternative-fuel vehicles (energy.gov/articles). The D.O.E.'s *EV Everywhere Grand Challenge* has become the driving force for the automotive industry to manufacture more environmentally friendly vehicles. The challenge, announced by President Obama in 2012, is a 10-year initiative focusing on producing affordable plug-in electric vehicles by 2022 (energy.gov). As a result, the market for alternative-fuel vehicles has expanded (afdc.energy.gov). According to the Vehicle Technologies Market Report, almost 500,000 hybrid vehicles were sold in 2013 (cta.ornl.gov). In the January 2014 report released by the Electric Drive Transportation Association, sales of plug-in electric and plug-in hybrid vehicles jumped 84 percent from 2012 to 2013. All plug-in vehicles, including hybrids, plug-in hybrids, and battery-run vehicle sales accounted for almost 600,000 in 2013, consisting of 3.8 percent of total automotive sales (EDA, 2015).

Why Hybrid Vehicles?

Petroleum-based fuels from transportation accounted for 30 percent of the nation's gas emissions (energy.gov). In addition, Americans spend $1 billion a day to import oil (energy.gov). The average American household expenditures for gas and oil were almost $2,750 in 2012 (Transportation Energy Data). Increasing fuel efficiency by 50 percent will decrease 2.2 million barrels of petroleum daily. The change will help reduce 6 million metric tons of carbon dioxide emissions, and the average consumer will save more than $800 annually. In order to help the environment as well as the economy, the government has invested $2.7 billion in manufacturing advanced technology vehicles (energy.gov). Since 2008, the D.O.E. has facilitated the use of alternative-fuel vehicles by reducing the production cost of electric vehicle batteries by 30 percent (energy.gov).

Hybrid electric vehicles (HEV) are primarily powered by an internal combustion engine and an electric motor, which improves fuel economy while maintaining performance for distance. During braking, HEVs convert the "energy normally wasted" into electricity, which is stored in a battery until the electric motor utilizes it (fueleconomy.gov, 2014, p. 35). On the other hand, plug-in hybrid electric vehicles (PHEV) have batteries that are charged by regenerative braking and by plugging the vehicle into an electrical outlet. As PHEVs store "enough electricity from the power grid to significantly reduce their petroleum consumption under typical driving conditions," they consume less petroleum than conventional hybrids (fueleconomy.gov/feg, 2014, p. 32).

HEVs and PHEVs are different from electric vehicles, which are only powered by electric motors and the rechargeable battery packs, because they still produce tailpipe gas emissions (fueleconomy.gov). Popular mid-size models include the Chevrolet Volt, Ford C-

MAX, the Ford Fusion Energi Plug-in Hybrid, and the Toyota Prius Plug-in Hybrid (fueleconomy.gov).

The number of hybrid vehicles is growing. In 2013, 16 unique, plug-in models were available from 11 manufacturers (cta.ornl.gov). Most notably, Toyota produced eight different models, General Motors had seven HEV and one PHEV models, Honda had four hybrid-electric models, and Ford manufactured three HEV and two PHEV models in 2013 (cta.ornl.gov). More than 40 models were available in 2013. In addition, Toyota Prius has been the top-selling model since its release in 2000, resulting in the sale of 220,000 cars in 2012 and 2013 (afdc.energy.gov/data). Toyota Prius PHV, Nissan LEAF, Chevrolet Volt, and the Tesla Model S accounted for the four most popular PEV models with 85 percent of the total PEV sales from 2010 to 2013 (afdc.enervy.gov).

To support the marketization of HEVs and PHEVs, the U.S. government established alternative-fuel stations. As of the summer of 2014, there were 15,769 public, alternative-fuel stations in the United States. In addition, 9,165 electric stations and 23,088 charging outlets were available in America to aid consumers (afdc.energy.gov).

Despite the popularity of hybrid vehicles, their expensive upfront costs still discourage consumers. According to a survey with people who had "some knowledge of alternative-fuel vehicles," 70 percent of respondents said they were against buying hybrid, plug-in hybrid, or all-electric vehicles because they are "too expensive to purchase" (Moody, 2014). While another 70 percent said they consider fuel economy as a reason for purchasing alternative-fuel vehicles, the costs seem to deter consumers from actually deciding to purchase it (Moody, 2014).

Although hybrid vehicles do in fact tend to have more expensive upfront costs than conventional vehicles, automotive companies are manufacturing more affordable hybrid

vehicles. Most notable is Nissan's all-electric Leaf, which resulted in the 36 percent sales increase from 2013 to 2014 after a lease rate of $199 a month (Brockman, 2014; Moody, 2014).

Governmental Support towards Hybrid Vehicles

In order to reduce petroleum consumption, the D.O.E. has encouraged the use of alternative-fuel vehicles. In 1992, the D.O.E. established Clean Cities and the Energy Policy Act (EPAct). Clean Cities coalitions have saved 6.5 billion gallons of petroleum by eliminating vehicle idling and accelerating the marketization of electric-drive vehicles since 1993 (eerie.energy.gov).

The D.O.E. also established the Advanced Technology Vehicles Manufacturing (ATVM) Loan Program. The D.O.E. issued more than $8 billion to automotive companies since 2009 (energy.gov). This investment resulted in saving 900 million gallons of gasoline and the production of more than 4 million advanced technology vehicles (energy.gov). The D.O.E. research facility, Argonne National Laboratory's Joint Center for Energy Storage Research (JCESR), also supports alternative-fuel vehicle development by innovating batteries and energy storage (energy.gov).

The D.O.E. supports various educational and workforce development by the Vehicle Technologies Office (VTO) to "train a future workforce of automotive engineering professionals in developing and commercializing advanced automotive technologies" (energy.gov). The educational programs include student competitions such as the Advanced Vehicle Technology Competitions (AVTCs) and the graduate education Graduate Automotive Technology Education (GATE). Through these educational outreach programs, the coalition among government, academia, and the automotive industry has played essential roles in marketing alternative-fuel vehicles. Given the importance of the governmental support in fostering the next generation of

automotive professionals, the next section discusses an automotive collegiate program, the AVTC Competition.

History of Advanced Vehicle Technology Competitions

In 1987, a data analyst for the Vehicle Technologies Program at D.O.E. initiated a program to encourage university students to design an energy efficient alternative-fuel vehicle. His initiation met the D.O.E. mission to provide energy and environmental solutions through "transformative science and technology solutions" (http://energy.gov/mission, 2014). In 1988, the D.O.E. research facility, Argonne National Laboratory and Society of Automotive Engineers, established the first AVTC challenge, Methanol Marathon, to provide university students a real-world, professional experience to re-engineer a donated vehicle to improve energy efficiency yet maintain consumer acceptability (avtcseries.org/avtc-history/beginning/).

Argonne National Laboratory has hosted 11 AVTCs: Methanol Marathon (1988-1990), Natural Gas Vehicle Challenge (1990-1993), Hybrid Electric Vehicle (HEV) Challenge (1992-1995), Propane Vehicle Challenge (1995-1997), FutureCar Challenge (1995-1999), Ethanol Vehicle Challenge (1997-2000), FutureTruck (1999-2004), Challenge X: Crossover to Sustainable Mobility (2004-2008), EcoCAR: The NeXt Challenge (2008-2011), EcoCAR 2: Plugging Into the Future (2011-2014), and EcoCAR 3 (2014-2018) (avtcseries.org/avtc-history/beginning/). Since the first AVTC, more than 16,5000 students from 93 universities across North America have participated in the program.

The Methanol Marathon (1998) was a one-year competition that converted the Chevrolet Corsica to operate on M85 (85 percent methanol and 15 percent hydrocarbons). The Natural Gas Vehicle (NGV) Challenge modified a donated GMC Sierra 2500 pickup truck to utilize natural gas. The next competition, Hybrid Electric Vehicle (HEV) Challenge converted specific vehicles

into hybrid electrics (e.g., Ford Escorts, Saturn SL2 sedans, and Dodge Neons) (www.avtcseries.org, 2014).

The Propane Vehicle Challenge (PVC) took place from 1995 to 1997 and converted the Chrysler Minivan into a propane-efficient vehicle. Universities participating in the FutureCar Challenge (1995-1999) designed advanced technologies for various mid-sized sedans including the Dodge Intrepid, Ford Taurus, Chevrolet Luminas, or Mercury Sable. The Ethanol Vehicle Challenge demonstrated the potential of ethanol. The FutureTruck competition, a five-year challenge that ran from 1999 to 2004, redesigned a General Motors or Ford full-size SUV. Challenge X (2004-2008) invited universities to re-engineer a 2005 Chevrolet Equinox to minimize energy consumption, emissions, and greenhouse gases while maintaining the vehicle's performance (www.avtcseries.org, 2014).

Following Challenge X was EcoCAR: The Next Challenge, the first of the EcoCAR competitions. It was a three-year collegiate AVTC implemented by the D.O.E. featuring a Chevrolet Equinox. Students designed and built advanced propulsion solutions based on the California Air Refocuses Board (CARB) zero emissions vehicle regulations (http://avtcseries.org/, 2008). EcoCAR 2: Plugging Into the Future (2011-2014) featured a 2013 Chevrolet Malibu. The goals of that competition were to reduce greenhouse gas and tailpipe emissions and maintain performance (www.ecocar2.org, 2014).

The most recent competition series is EcoCAR 3. The Chevrolet Camaro will be redesigned into a hybrid-electric vehicle to reduce environmental impact, while maintaining the specific look and performance expected from the iconic American muscle car. During the four years of EcoCAR 3 (2014-2018), teams will redesign the Camaro considering cost and innovation of the vehicle design. The Camaro should keep its appealing body design, and student

teams will develop eco-power and performance under the hood, retain safety and meet high consumer standards. Teams will focus on lowering emissions by incorporating alternative-fuels (ecocar3.org).

As combination of benefits of hybrid vehicles, it is noteworthy to examine what marketing messages might encourage consumers to consider hybrids. Thus, the current study focuses on testing different types of persuasive messages to understand what type of message has more of an impact – messages focusing on the environmental impact of driving a hybrid vehicle or messages discussing fuel economy. The study also tests if narrative messages or statistical messages have more of an impact on individuals' attitudes about hybrid vehicles.

Chapter 2

Literature Review

There are many approaches to persuasion, but one in particular that researchers have noted is the importance of narrative. Scholars have argued the persuasive impact of narrative is greater than advocacy or rhetoric, because narratives are more likely to influence the audience's belief system (Green & Brock, 2000). Given the essential role narrative plays in persuasion, Chapter 2 examines the theoretical aspect of narrative theory and addresses its possible application in the marketing of hybrid vehicles.

The definitions of narrative vary. Some are very general, including narrative as "the verbal nature of the medium used to transmit the message" (Rimmon-Kenan, 2003, p. 2). A narrative message might be "something that communicates real or fictitious events from the past" occurring in a "discourse, whether verbal, written, pantomimic or any other form of narrative transmission" (Dubbelman, 2011, p. 159). It is also what the audience interacts and interprets "in accordance with his or her prior knowledge, attention, personality, demographics, and significant others" (Van Laer et al., 2014, p. 799). Narrative can also be defined as "the story receiver's consumption of the story through which he or she does not just read the story but also makes it readable in the first place" (Van Laer et al., 2014, p. 799). In this sense, a narrative involves the audience's active interaction with the story, which is communicated and interpreted beyond just the text.

A narrative activates consumers' affective and cognitive abilities to relate to the story, eventually influencing their attitudes and behaviors toward the story content. Scholars found narratives increase cognitive and emotional elaboration, while inhibiting the effects of counter-argument (Busselle, Bilandzic & Zhou, 2009). Narrative persuasion takes various forms. Past

research differentiated the processing of narrative message from that of argument-based message processing (Weber & Wirth, 2014). Oschatz and Klimmt (2011) argued narratives are more effective than non-narratives because the former resembles "the structure of the human autobiographical memory…narrative messages are much easier to process and to remember than bare numbers and statistics" (p. 7). While the argument-based message form directly delivers the persuasive message, the narrative indirectly provides it with vivid mental images (Green & Brock, 2000; Green & Brock, 2004; Weber & Wirth, 2014). Individuals can engage in, be transported into, absorbed by, and interact or identify with the story (Weber & Wirth, 2014).

Affective Processing of Narrative Messages

Narrative messages trigger an emotional reaction as well as a detachment from real-world information (Green & Brock, 2000). The story format in a narrative effectively persuades the audience in both fictional and nonfictional contexts because people can sympathize and relate to the story (Green & Brock, 2000; Green & Brock, 2004; Zheng, 2014). The most widely discussed concept regarding affect in narrative persuasion is transportation, the state of absorption that "carries one away" in a story world and impedes one's cognitive ability to critically evaluate the message (Phillips & McQuarrie, 2010).

Conceptualizing narrative as story that engages individuals, Green and Brock (2000) defined narrative transportation as a "convergent process, where all mental systems and capacities become focused on events occurring in the narrative" (p. 701). During transportation, "engaged viewers…lose awareness of their own activity or following the plot or constructing the narrative, and should become aware of that activity only when it is not progressing smoothly" (Busselle & Bilandzic, 2008b, p. 19). Thus, it is likely that disruption of engagement produces a negative response. For example, highly transported participants were less favorable towards the

advertisement inserted in the middle of the story than those who were less transported (Wang & Calder, 2006).

Transportation is an important factor in narrative persuasion. The state of being "carried away" in the story leads the audience to not only identify with the character, but also accept the message without questioning as much. In addition, the deeper the magnitude of transportation, the less critically an audience analyzes the message (Phillips & McQuarrie, 2010). When an individual is transported into the message, he or she is not likely to notice the strength of argument; yet when the person is not transported the weight of argument matters because he or she cognitively processes the message (Escalas, 2004). Thus, transportation not only allows individuals to assimilate with the product or message, but also mediates the cognitive process.

One can be immersed in the format and "the work of art" without being fully carried away with the story (Phillips & McQuarrie, 2010). Busselle et al. (2009) empirically demonstrated a viewer's ability to engage in a narrative influenced his or her attitudes and beliefs towards the message. Engageability is an emotional reaction elicited by the filmic stories, rather than rational experiences (Bilandzic et al., 2009b).

Both cognition and emotion are deciding factors of narrative engagement, as audiences will be more engaged with a story if they can logically process the message or sympathize with the character (Busselle et al., 2009). Cognitive involvement in the story helps the audience understand the motivation of the character, leading them to empathize with the character's action. While emotion plays a central role in narrative transportation, cognition aids transportation by evaluating the similarity and difference between the perceived reality and the story.

Cognitive Processing of Narrative Messages

As stated above, then, cognition is one of the key factors in narrative engagement. Scholars noted the factors that disrupt narrative engagement are caused by interruption of cognitive tasks (Graff, Hoeken, Sanders & Beentjes, 2009). Graaf et al. (2009) found "selection task" and language errors such as grammar and spelling impeded narrative engagement (p. 398). The act of selecting a sentence in a paragraph caused readers to focus "cognitive resources on the extra task of selecting sentences that could be left out, rather than the construction of a story world" (Graff et al., 2009, p. 398). The more people rationally thought about the narrative, the less they were immersed in the story (Bilandzic, Spitzner, Kalch & Reich, 2009).

However, scholars note the importance of inconsistencies in persuasion. More cognitive processing makes the message persuasive (Smith & Petty, 1996). Encountering inconsistent information with one's expectancy will lead him or her to pay close attention to the message because it requires mental processing (Smith & Petty, 1996). Researchers found people are generally accustomed to engaging in positively (gain-) framed messages, and they tend to not expect negatively (loss-) framed messages (Smith & Petty, 1996). Because the audience does not expect negatively framed message, they will be persuaded by the unexpected, negative message (Smith & Petty, 1996). Thus, using unexpected message frames can be an effective persuasion method, which will positively influence the attitudes toward the issue.

Narratives vs. Statistical Messages

Scholars have noted the difference between narratives and statistical messages. While narratives include stories, testimonials, opinions, examples, and case histories, statistical messages include rational and quantitative information presented in hard data or numerical representations (Hardy, 2011). Statistical messages are the report of "detailed data, including

frequencies, ratios, and probabilities," which are often perceived as "more objective, verifiable, representative, and informative than narrative messages" (Hardy, 2011, p. 28). Green and Brinn (2003) found statistical messages were more effective than narrative messages in persuading college women to reduce their use of tanning beds. Oschatz and Klimmt (2011) found narratives did not effectively change the attitudes towards speeding as statistical messages did. Hardy (2011) found both narrative and statistical messages are equally influential in shifting attitudes and beliefs, with or without a visual component.

Research has found individuals with high cognition were transported into the print medium more effectively because this allows in-depth exploration of characters and requires time and imaginative investment (Green et al., 2008). Those with low cognition were transported more into the film medium that provides observable visual effects and behaviors (Green et al., 2008).

Prior knowledge or personal experience pertinent to the story creates higher transportation, as knowledge and familiarity about topics facilitate understanding (Bilandzic & Busselle, 2008). Green (2010) examined the cause-effect relationship between prior knowledge pertinent to the theme of the story and the audience's level of transportation. Individuals with personal affinity or whose friends or family had a similar experience as the character were more transported in the story (Green, 2010).

This survey of literature found persuasive effects of both narrative and statistical messages. Narratives prompt the audience's affective and/or cognitive response to be carried away "from their mundane reality and into a story world" (Green & Brock, 2004, p. 311). On the other hand, statistical messages elicit cognitive processing, in which readers process the messages more rationally. Requiring individuals to use cognitive resources to process messages

makes the message more persuasive (Smith & Petty, 1996). The current study develops narrative

and statistical messages to test the persuasiveness of the messages on consumers' attitudes and

purchase intent of hybrid vehicles. Researchers have examined why people purchase green

products, and this literature is reviewed in Chapter 3.

Chapter 3

Environmental Marketing Research

Understanding consumer interest is essential for marketing hybrid vehicles. Scholars have found individuals' overall environmental concern affects their green purchase decisions (Datta, 2011; Schwepker & Cornwell, 1991). Individuals who are concerned about littering and pollution pursue environmentally conscious lives and recycle, and are more likely to purchase ecologically packaged products to minimize solid waste problem (Schwepker & Cornwell, 1991). In addition, consumers' purchase intent was influenced by a company's environmental reputation and the cost of the product. Consumers are less willing to pay more for an environmentally "sound" product (Schwepker & Cornwell, 1991).

Through a content analysis of environmental slogans and general-theme slogans, Kronrod and colleagues (2012) found more than half of the environmental slogans were assertive, such as Plan for the Planet's, "Stop talking. Start planting" and the Ad Council's "Only YOU can prevent forest fires" (p. 95). Based on the content analysis findings, the scholars conducted an experiment and found environmentally conscious consumers are more likely to comply with an assertive message pushing consumers into pro-environmental action (Kronrod, Grinstein & Wathieu, 2012). In contrast, those with low issue involvement negatively reacted to assertive messages: "the when people do not perceive the issue as important, the last thing that will prompt them to respond is an assertive request" (Kronrod et al., 2012, p. 100).

Other scholars investigated different types of environmental messages and persuasive tactics. Through portrayal of tragic consequences, the "sick baby" appeal, which emphasizes the seriousness of the problem, might result in negative outcomes because the problem may "appear

to be so overwhelming that there is nothing a single individual can do" (Ellen et al., 1991, p. 112).

Nath and colleagues (2013) investigated different types of "enablers" that promote proactive attitudes and behaviors for consumers to adopt green products. Individual characteristic "enablers" include high levels of education or literacy, environmental awareness, and environmental attitudes on specific eco-friendly behaviors rather than general attitudes towards the environment (Nath et al., 2013). Nath et al. (2013) found level of education was the most important enabler for sustainability, as literacy is crucial for consumers to comprehend green advertising and eco-labeling. Consumers with higher education are more likely to purchase eco-friendly products because they are likely to be more knowledgeable about environment-related issues (Datta, 2011), and education level has a significant effect on green purchasing intent (Shahnaei, 2012).

Green advertising and eco-labeling are also enablers because the information helps "transform this knowledge into the purchase of green products" (Nath et al., 2013, p. 465). Legal enforcement (i.e., tax) and incentives (i.e., tax credit) are enablers that motivate consumers to adopt green products, if the monetary deduction/incentives are not deemed to restrict freedom of choice (Nath et al., 2013).

Davis (1995) studied the effects of message contents. He found environmental messages framed with problem, consequences to target audience, and behavioral actions/inactions positively influenced an individual's willingness to participate in green behaviors, such as conservation, recycling and green-product purchase.

Hybrid Vehicle Marketing Research

Marketing research identified characteristics of hybrid vehicle consumers and found those with the highest purchase intent are younger, highly educated, environmentally sensitive "early adopters" (Carley, Krause, Lane, & Graham, 2013; Lera-Lopez, Faulin, & Sanchez, 2012). Because hybrid vehicles (i.e., battery-electric vehicle) represent "commitment to sustainable energy and care for the environment," it is a source of positive social identity (Graham-Rowe et al., 2012, p. 150). For example, car ownership represents social status, self-esteem, autonomy, and symbolism, which are driving factors of hybrid vehicle or electric vehicle purchase intent (Graham-Rowe et al., 2012). Consumers also indicated fuel economy as the primary advantage of hybrid or plug-in vehicles, while they were less likely to view environmental image and technological innovation as advantageous (Carley et al., 2013). Ozaki and Sevastyanova (2011) found participants were more interested in personal benefits, such as financial gain, practicality, and comfort "rather than [topics] related to bigger issues such as the environment"(p. 2224).

Not every hybrid consumer is the same. Oliver and Rosen (2010) studied hybrid-electric marketing strategies for five different consumer groups based on their environmental propensity: "true greens," "low potency greens," "moderate greens," "modest greens," and "non-greens," "True greens" have the least price sensitivity, whereas "non-greens" are most price sensitive. For "true greens" that have the highest behavioral intentions toward hybrid cars, blogs and viral media outlets are effective because they actively share their opinions and strive to make an impact for the environment (Oliver & Rosen, 2010). Messages addressing "technological savviness" will also persuade "true greens" (Oliver & Rosen, 2010).

"Low potency greens" are individuals who are most skeptical towards marketing communications and new products. They are most persuaded by word-of-mouth campaigns that "make hybrid car acceptance by others" (Oliver & Rosen, 2010, p. 389). For those with medium environmental values that do not believe an individual can make a difference (i.e., moderate green), it is effective to use online marketing programs because of their tech-savvines and willingness to solve complex problems (Oliver & Rosen, 2010.) On the other hand, personal channels are effective to persuade "modest greens" because "it is unlikely they will actively seek information about hybrid cars or engage in complex thinking on their own about environmental issues" (Oliver & Rosen, 2010, p. 390). Oliver and Rosen (2010) state "non-greens" are least likely to purchase a hybrid while they had the lowest skepticism toward marketing communications.

The survey of literature discussing consumer characteristics of green products suggests individuals were highly educated and environmentally conscious. Findings from the green-product marketing conclude environmental campaigns have been assertive and mostly negatively (loss-) framed to appeal to the consumers by scaring them with the consequences of the anti-environmental action. Hybrid vehicle marketing also focused on the environment but included different levels of strategies to appeal to consumers based on their green-issue involvement. The current study attempted to extend the literature and test different types of environmental messages (statistical or narrative) as well as determine if messages about fuel economy would appeal to consumers.

Research Question and Hypotheses

The current study explores different types of persuasive messages used to market hybrid vehicles. The types of messages examined are statistical and narrative messages. Statistical and

narrative messages are important in influencing individuals' beliefs, opinions, attitudes, and behavior because of their ability to help individuals make sense of relationships, events, and the world (Hardy, 2011; Slater & Rouner, 2002; Zillmann, 1999). Messages with rational appeals directly activate cognitions by presenting information about the product or service to "convince the consumer that the advertised item is the best choice" (Luuk, 2009, p. 1). According to Lindsey and Ah Yun (2003), statistical messages are perceived as verifiable because statistical evidence is "highly specific – using precise percentages, frequencies, and probabilities" (p. 309). In addition, "utilizing statistical appeals creates a more credible illustration of the issue" by serving as "the credible representation of reality" (Lindsey & Ah Yun, 2003, p. 310). In contrast, narrative messages persuade the consumers by evoking "good feelings" about advertising features that are inferred from the story (Luuk, 2009). Thus, creating a message with positive attributes about the product is essential to persuade the audience. Drawing from the literature comparing the effects of narrative and statistical messages, this study proposes a research question:

RQ1: Does the type of message (statistical or narrative) influence attitudes toward hybrid vehicles?

RQ2: Does the type of message (statistical or narrative) differ in persuasive impact?

Research suggests narrative messages are more effective in persuading individuals' opinions, attitudes, and behavior because narrative messages are more personal, concrete, and vivid (Gray, 2009; Hardy, 2011; Taylor & Thompson, 1982). By causing message vividness, narratives enable message comprehension and recall without reduced counterarguments because they are "generally accepted as more concrete, memorable, and colorful" (Hardy, 2011, p.12; Nierderdeppe et al., 2008). This study hypothesizes individuals will be more persuaded by vivid

stories about the environmental benefits of hybrid vehicles than statistical evidence. Thus, this study proposes:

H1: Participants who read narrative messages will have positive attitudes, greater affect, and greater purchase intent towards hybrid vehicles than those who read statistical messages.

Higher levels of education and environmental attitudes are predictors of purchasing eco-friendly products (Datta, 2011; Nath et al., 2013). Hybrid vehicles represent "commitment to sustainable energy and care for the environment," and fuel economy is the primary advantage of hybrid vehicles (Graham-Rowe et al., 2012, p. 150; Carley et al., 2013). However, personal benefits of driving a hybrid sometimes are more persuasive than thinking about the impact of saving the environment (Ozaki & Sevastyanova 2011). Personal relevance can influence a message's persuasive effects because individuals can perceive the object to be self-related or aligned with their personal goals and values (Ghuge, 2010). Because previous research indicates motives for purchasing hybrid vehicles and green products can be personal in nature (environmental identity, education), this study examined how persuasive different types of messages could be.

In addition to variance in persuasive modality – narrative vs. statistical – the specific rationale used in the message may also be relevant. Consumers indicated fuel economy as the primary advantage of purchasing a hybrid or plug-in vehicle, while they were less likely to view environmental image and technological innovation as advantageous (Carley et al., 2013). Participants are more interested in the personal benefits of driving a hybrid, such as financial gain rather than the big picture (i.e., environmental impact) (Ozaki & Sevastyanova, 2011). This

study examines if messages emphasizing a hybrid vehicle's fuel economy are more persuasive then messages emphasizing the environmental impact of driving a hybrid.

H2: Participants who read messages about hybrid vehicles' fuel economy will have positive attitudes, greater affect, and greater purchase intent for hybrid vehicles than those who read messages discussing the impact of driving a hybrid on the environment.

Chapter 4

Methodology

This thesis examined the persuasive effects of different types of messages (statistical vs. narrative) and different message content (fuel economy vs. environmental impact). The study explored if message type and content would influence attitudes toward hybrid vehicles and purchase intent.

Participants

The study was reviewed and approved by the Pennsylvania State University Institutional Review Board (IRB). Participants were recruited using Amazon Mechanical Turk. After completing the informed consent form participants ($N = 320$) completed the questionnaire. They were paid $.25.

The average age of the respondent was 33.27 years ($SD = 9.93$ years). Respondents' gender was operationalized as male (59.4%) or female (40.6%). Race was assessed by asking if they were: Asian or Pacific Islander (59.4%), Caucasian (25.9%), African-American (6.3%), Native-American (5.3%), or Hispanic (2.8%).

Education was operationalized as: some high school (1.6%), high school degree (10.9%), associate's degree (8.8%), college or professional school degree (44.1%), a master's degree (33.1%), or advanced professional degree (1.6%).

Household income was operationalized as: below $25,000 (36.3%), between $25,000 and $34,999 (22.2%), between $35,000 and $44,999 (11.3%), between $45,000 and $54,999 (10.6%), between $60,000 and $74,999 (10.9%), and $75,000 and $89,999 (5.3%), and above $90,000 (3.4%).

Procedures

An online survey was created using Qualtrics. Participants were randomly assigned to one of the four experimental conditions when they logged in to the survey. Condition 1 was a narrative message discussing the environmental benefits of driving a hybrid vehicle ($n = 79$, 24.7%). Condition 2 was a statistical message discussing the environmental benefits of driving a hybrid vehicle ($n = 81$, 25.3%). Condition 3 was a statistical message discussing a hybrid vehicle's fuel economy ($n = 82$, 25.6%). Condition 4 was a narrative message discussing a hybrid vehicle's fuel economy ($n = 78$, 24.4%). After reading the message, the participants answered a questionnaire.

Stimuli

The study used four experimental messages approximately 300 words in length. It employed a 2 (statistical vs. narrative, message type) X 2 (environmental impact or fuel economy, content type). See Appendix A for the complete texts of the stimuli.

Statistical messages included quantitative data about the fuel economy of a hybrid vehicle or the impact of driving cars on the environment. An excerpt from a statistical message states:

> Are you spending $2.55 per gallon of gas? According to the Department of Energy, the average price of gasoline in the U.S. is $2.55 a gallon, whereas the price of electricity to charge a hybrid car only costs $1.28 a gallon... By driving a hybrid, you can save more than $800 every year.

Narrative messages included a story about how a hybrid car could reduce the negative environmental impact (carbon footprint) or the fuel economy of a hybrid car. An excerpt from the a narrative states:

> She also said she loves making an impact for tomorrow where her son and her future grandchildren can grow up with clean air. "Now I don't have to worry about my kids breathing in smog. It feels great to know what I do now helps the next generation grow up in a healthy planet. I feel like I'm doing my job as a parent."

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Manipulation Check

  To ensure the participants distinguished between the statistical messages and narrative messages, two manipulation check questions were asked (Hardy, 2011). After collecting data (N = 320), a one-way analysis of variance (ANOVA) depicted **statistically significant differences** for the message condition on the manipulation check questions: "I think the message contains facts and statistics" $F(3, 319) = 16.63$, $p =.000$, $\eta^2 = .14$; "I think the message contains a story" $F(3, 319) = 6.57$, $p = .000$, $\eta^2 = .06$.

  For the first manipulation check question, "I think the message contains facts and statistics," those reading statistical messages scored significantly higher ($M = 5.68$, $SD = 1.02_{statisticalfuel}$; $M = 5.98$, $SD = 1.12_{statisticalenvironment}$) than those reading narrative messages ($M = 4.62$, $SD = 1.80_{narrativeenvironment}$; $M = 4.96$, $SD = 1.45_{narrativefuel}$). For the final manipulation check question, "The message contains a story," those reading narrative messages scored higher ($M = 5.62$, $SD = 1.28_{narrativeenvironment}$; $M = 5.55$, $SD = 1.05_{narrativefuel}$) than those reading statistical messages ($M = 4.88$, $SD = 1.54_{statisticalfuel}$; $M = 4.86$, $SD = 1.77_{statisticalenvironment}$). The differences between the statistical message and narrative messages were statistically significant.

Independent Variables

  The independent variables included message type (statistical, $n = 163$; or narrative, $n = 157$) and the message content (environmental impact, $n = 160$; or fuel economy, $n = 160$).

Control Variables

  Environmental Identity. Eleven items on a 7-point bipolar scale from the Environmental Identity Scale were used to measure the participants' perceived importance of environment (Stets & Biga's, 2003). Items included: in competition with the environment/in cooperation with the environment; detached from the environment/connected to the environment;

very concerned about the environment/indifferent about the environment; very protective of the environment/not at all protective of the environment; superior to the environment/inferior to the environment; very passionate towards the environment/not at all passionate towards the environment; not respectful of the environment/very respectful of the environment; independent from the environment/dependent on the environment; an advocate of the environment/disinterested in the environment; wanting to preserve the environment/wanting to utilize the environment; nostalgic thinking about the environment/emotionless thinking about the environment (a= .91, M = 5.54, SD = .99). Education and income were also used as covariates in the current study. Education and income were also used as covariates in the current study.

Dependent Variables

Perceived persuasiveness assessment

Two variables including message evaluation and message attitude agreement were collapsed in order to create a single persuasion measure for each participant (α = .96, M = 5.67, SD = .99) (Braverman, 2008).

Message evaluation. Twelve items measured the participants' perceived effectiveness of the message arguments using a 7-point semantic differential scale (Dillard et al., 2007; Stitt & Nabi, 2009). Items included: not at all persuasive/very persuasive; not at all effective/very effective; not at all compelling/very compelling; not at all convincing/very convincing; not at all believable/very believable; not at all sensible/very sensible; weak/strong; forgettable/memorable; misleading/straightforward; not at all clear/very clear; not at all credible/very credible; not at all important/very important (α = .95, M = 5.66, SD = 1.07).

Message attitude agreement. Three, 7-point Likert-type scale items adopted from Shen and Dillard (2005) measured message attitude agreement. Items included: I support what the

message was trying to accomplish; I totally agree with the position promoted in the message; I am favorable towards the main point of the message. Items were anchored at (1) *strongly disagree* to (7) *strongly agree* (α = .91, M = 5.73, SD = 1.07).

Affect toward the product. Participants were also asked to indicate their feelings about hybrid vehicles after reading the messages. The participants were instructed to indicate their feelings for nine items placed on 7-point semantic differential scales (Goodstein, Edell & Moore, 1990). Items included: extremely well/not well at all; active/passive, alive/dead, cheerful/gloomy, delighted/dismay, energetic/weak, happy/sad, pleased/unhappy, stimulated/discouraged (α= .96, M = 5.69, SD = 1.11).

Attitude. Seven items on 7-point semantic differential scales measured attitudes toward hybrid vehicles (Dillard & Shen, 2005). Items included: bad/good, foolish/wise, unfavorable/favorable, negative/positive, undesirable/desirable, unnecessary/necessary, and detrimental/beneficial (α = .96, M = 5.01, SD = 1.04).

Purchase intent. Purchase intent was measured by combining two scales from Gill, Grossbart, and Laczniak (1988) and Urbany, Bearden, Kaicker, and Smith-de Borrero (1997). The questions asked participants if they would purchase a hybrid or alternative-fuel vehicle. The scale included six, 7-point bipolar adjective pairs including: unlikely/likely; nonexistent/existent; improbable/probable; impossible/possible; uncertain/certain; definitely would not/definitely would (α = .96, M = 5.70, SD = 1.38).

Chapter 5

Results

Research Question 1 asked what type of message (statistical or narrative) would influence attitudes toward hybrid vehicles. A one-way analysis of variance (ANOVA) was computed for the independent variable of message and the dependent variable attitude. The ANOVA was **not statistically** significant, $F(1, 319) = 2.17$, $p = .142$, partial $\eta 2 = .01$. Those reading narrative messages had a more positive attitude about hybrid vehicles ($M = 5.10$, $SD = .91$) than those reading statistical messages ($M = 4.93$, $SD = 1.16$). However, the mean differences were not statistically significant.

Research Question 2 asked if the type of message (statistical or narrative) would differ in persuasive impact. A one-way ANOVA was computed for the independent variable of message and the dependent variable message persuasiveness. The ANOVA was **not statistically** significant, $F(1, 319) = .09$, $p = .769$, partial $\eta 2 = .00$. Those reading narrative messages did not indicate higher levels of message persuasiveness ($M = 5.66$, $SD = .96$) than those reading statistical messages ($M = 5.69$, $SD = 1.02$).

To test Hypotheses 1, a multivariate analysis of covariance (MANCOVA) was computed. Message type (narrative or statistical) was the independent variable. Affect toward the product, attitude, and purchase intent were the dependent variables. Covariates in this analysis included income, education, and environmental identity.

The omnibus results did not find any statistically significant differences for experimental condition Wilks' λ $F(9, 740) = 1.78$, $p = .068$, partial $\eta 2 = .02$. However, subsequent univariate tests revealed **statistically significant** differences for the independent variable message type

(narrative or statistical) on the dependent variables, *affect toward product*, $F(1, 319) = 2.88$, $p = .04$, $\eta 2 = .03$; and *attitude toward hybrid vehicles*, $F(1, 319) = 3.12$, $p = .03$, $\eta 2 = .03$.

      Hypothesis 1 predicted participants who read narrative messages about hybrid vehicles would have more positive attitudes, affect, and greater purchase about hybrid vehicles than those reading statistical messages. When examining the pattern of means, there were some differences between the content and the type of message. Those reading narrative messages had a more positive attitudes ($M = 5.10$, $SD = 1.00$), greater purchase intent ($M = 5.71$, $SD = 1.30$), and affect toward hybrid vehicles ($M = 5.74$, $SD = 1.00$) when compared to those reading statistical messages ($M = 4.93$, $SD = 1.16_{attitude}$, $M = 5.65$, $SD = 1.46_{purchase\ intent}$, $M = 5.64$, $SD = 1.22_{affect}$). Those reading narrative messages did have more positive attitudes, affect, and greater purchase intent. However, statistically significant differences were only found affect and attitude. Therefore, Hypothesis 1 was partially supported.

      To test Hypotheses 2, a multivariate analysis of covariance (MANCOVA) was computed. Message content (fuel economy or environmental impact) was the independent variable, and affect toward the product, attitude, and purchase intent were the dependent variables. Covariates in this analysis included income, education, and environmental identity.

      The omnibus results found **statistically significant** differences for experimental condition Wilks' λ $F(3, 313) = 2.62$, $p < .05$, partial $\eta 2 = .02$. Subsequent univariate tests revealed **statistically significant differences** for the independent variable message content (fuel economy or environmental impact) on the dependent variables: *affect toward product*, $F(1, 319) = 5.82$, $p = .02$, $\eta 2 = .02$; and *attitude toward hybrid vehicles*, $F(1, 319) = 4.82$, $p = .03$, $\eta 2 = .02$.

      Hypothesis 2 predicted participants who read messages about hybrid vehicles' fuel economy would have positive attitudes, greater affect, and greater purchase intent toward hybrid

vehicles than those reading messages discussing the impact of driving a hybrid on the environment.

The pattern of means indicates the opposite of what was predicted. Those reading messages discussing the impact of driving hybrid vehicles on the environment had more affect toward the product ($M = 5.82$, $SD = 1.04$), had a more positive attitude ($M = 5.13$, $SD = .96$), and greater purchase intent ($M = 5.77$, $SD = 1.43$) compared to those reading messages about hybrid vehicles' fuel economy ($M = 5.55$, $SD = 1.16_{\text{affect}}$; $M = 4.90$, $SD = 1.11_{\text{attitude}}$; $M = 5.59$, $SD = 1.33_{\text{purchase intent}}$). Therefore, Hypothesis 2 was not supported. The pattern of means found the opposite of what was predicted because the messages about the environment scored higher than those discussing fuel economy.

Chapter 6

Discussion

The primary purpose of this study was to explore how different types of messages (statistical vs. narrative) and the content characteristics in the message (fuel economy vs. environmental impact) influenced perceived message persuasiveness and attitudes about hybrid vehicles.

The first goal of the current study was to find out what types of messages (statistical or narrative) would influence attitudes toward hybrid vehicles. Research Question 1 asked if the type of message (statistical or narrative) would influence attitudes about hybrid vehicles. Results did not find any statistically significant differences between narrative and statistical messages. Those reading narrative messages did have more positive attitudes about hybrid vehicles. The pattern of means indicated narrative messages were more influential in shaping positive attitudes towards hybrid vehicles. The mean differences between the two experimental conditions were not statistically significant, but were approaching significance.

This finding supports research by Green and Brock (2000) who concluded narratives are more effective because individuals are transported into the message. Transportation reduces one's cognitive ability to disbelieve or counterargue, while elaboration influences attitude change by establishing connections with the individual's experiences pertinent to the story (Green & Brock, 2000; Slater & Rouner, 2002). Narratives arouse emotions (Busselle & Bilandzic, 2009), and attitudes have an emotional component. While not statistically significant, the differences between the narrative and statistical message indicate the readers' ability to empathize with the anecdote told in the narrative story. Narrative messages do generate effects that may sway the readers' attitudes toward the topic of the message.

Another goal of the current study was to investigate if the type of messages (statistical or narrative) would differ in persuasive effect. Research Question 2 asked if the type of message (statistical or narrative) differed in persuasiveness. There were very little differences when examining the mean scores for persuasiveness. Those reading narrative messages did not indicate higher levels of message persuasiveness ($M = 5.66$, $SD = .96$) than those reading statistical messages ($M = 5.69$, $SD = 1.02$). The current study did not find any statistically significant differences between the two types of messages. Past research (e.g., Feeley et al., 2006; Reinhart & Feeley, 2007) found statistical evidence produced stronger persuasive effects, but the current study could not support this finding.

The current study controlled for income, education, and the environmental issue involvement given previous research. Individuals with a high income, educational level, and more environmentally involved, are considered technology enthusiasts, who are "…better connected with global technology development…and are more equipped to sort out the many technological, financial and environmental differences" between conventional and alternative-fuel vehicles (Egbue & Long, 2012, p. 719). Nath et al. (2013) found low education levels acted as a barrier to going green, while peer groups and cultural values also influenced individuals' green behaviors. Consumers who purchased electric vehicles consisted of those whose income was above the national average, as the upfront costs for the non-conventional vehicles are more expensive than the conventional vehicles (Graham-Rowe et al., 2012). Davis (1995) found environmental messages framed with problem, consequences to target audience, and behavioral actions/inactions positively influenced an individual's willingness to participate in green behaviors, such as conservation, recycling, and green-product purchase. Drivers who perceive

their cars as being environmentally friendly drove their cars more than those who did not, and they viewed their cars as a solution to the environmental (Graham-Rowe et al., 2012).

The current study found income, education, and the environmental issue involvement were not significant factors that influenced the message's persuasive effects of hybrid vehicles. However, an analysis of the participants' demographic information in the current study indicates participants had less income (i.e., below $25,000) but did have a higher level of education (i.e. four-year college degree). Given the consumer market research suggests individuals who are wealthier with higher levels of education are more likely to purchase hybrid vehicles, it is likely the lack of variance in the income or education variables in the current study might have skewed the results.

The current study also explored which type of message (statistical vs. narratives) would lead to positive attitudes, affect, and purchase intent of hybrid vehicles. Hypothesis 1 stated participants who read narrative messages would have more positive attitudes, greater affect, and greater purchase intent toward hybrid vehicles than those who read statistical messages. This hypothesis was partially supported because those reading narrative messages had a more positive affect and attitudes toward hybrid vehicles than those reading statistical messages. There were statistically significant differences between those in the narrative and statistical condition but only for two of the three variables (attitude and affect).

These findings support past literature that states readers of narrative stories can experience mental simulation, "the cognitive construction of hypothetical scenarios… of rehearsals of likely future events… or reconstructing past events," and individuals reflect on their "potential behaviors, creating behavioral episodes in which [they] are the main character" (Escalas, 2004, p. 37). The narrative stimuli employed in the current study included a story that

recounted the character's personal experience. Participants could identify with the character in the narrative because the story discussed personal benefits of driving a hybrid vehicle (i.e. money savings from gas mileage), and the potential good deeds the character is doing for the future generation (i.e. saving the environment).

The final goal of the study was to investigate how the message content (fuel economy or environmental impact) would influence affect, attitude, and purchase intent of hybrid vehicles. The current study hypothesized participants who read messages about hybrid vehicles' fuel economy would have more positive attitudes, affect, and greater purchase intent toward hybrid vehicles than those reading messages discussing the environmental impact of driving a hybrid.

Hypothesis 2 found the opposite of what was predicted. When controlling for income, education, and environmental identity, messages about environmental benefits have greater persuasive effects towards hybrid vehicles than messages about the fuel economy. Compared to the individuals who read messages about the fuel economy of hybrid vehicles, those who read messages discussing the impact of driving hybrid vehicles on the environment had more affect toward the product, had a more positive attitude, and greater purchase intent. Results from Hypothesis 2 found statistically significant difference between the content of the message (i.e. fuel economy and environmental impact) on the affect and attitude toward the product. Individuals who read about the hybrid vehicles' fuel economy feature had statistically significant different feelings and attitude towards the vehicle compared to those who read about the environmental impact. However, the pattern of means contradicted what was posited for Hypothesis 2. Rather than messages about fuel economy appealing to individuals, it was the messages about the environmental impact driving a hybrid could have that appealed to individuals.

The current study's findings contradict previous research that suggests consumers are interested in purchasing hybrid vehicles because of their sustainable and fuel-economy features rather than the environmental impact (Egbue & Long, 2012). Consumers indicated fuel economy as the primary advantage of purchasing a hybrid or plug-in vehicle (Carley et al., 2013). Individuals were also more interested in the personal benefits of driving a hybrid, such as financial gain rather than the big picture (i.e., environmental impact) (Ozaki & Sevastyanova, 2011). Although drivers were not confident about the amount of savings, they positively evaluated the gas savings from less petroleum consumptions (Graham-Rowe et al., 2012).

The stimuli about the fuel economy emphasized the money saved from gas mileage could pay for something later (i.e., college tuition); however, since the participants were low income, the long-term benefits might not concern them as much as the upfront cost for purchasing the vehicle.

Limitations and Future Directions

The first limitation for the study is social desirability when answering questions about the environment. The Environmental Identity Scale has been used in past research. However, it is very unlikely one would respond to a question about environmental conservation in a negative way. Most would answer questions about the environment in a socially desirable way.

The messages employed in the study told the participants to drive a hybrid vehicle if they cared about the environment (e.g., "If you care about the environment, drive a hybrid"), the participants might have responded in such a way to make themselves look pro-environmental. Thus, future studies might employ multiple environmental involvement scales to determine which one includes questions that might be more neutral and less likely to elicit socially desirable responses

In addition, the use of Mechanical Turk is another limitation, as it might have skewed the sample. A majority of the participants seemed to be relatively low income, as they earned less than $25,000 but had four-year college degrees, characteristics that are not of typical for those who drive hybrid vehicles.

In addition, more than half of the participants were Asian or Pacific Islander. Race has not been a predictor of environmental attitude or purchase intent of hybrid vehicles in past research, but over-representation of one race might skew the results. Future studies should be conducted with a population that has a more diverse education level, income level, as well as a more inclusive racial demographic. While Mechanical Turk was used because of its convenience and promptness, researching those with higher incomes will be helpful to obtain more representative findings.

Marketing research about the environmental products or hybrid vehicles did not find any studies applying narrative messages. The current study provides a foundation for future research to build on. Future studies might examine the use of gain/loss frames. In addition, past research suggests narratives take away the individual's ability to counterargue, something this study did not measure. Future studies might also apply the Elaboration Likelihood Model to test marketing messages in order to determine if messages about hybrid vehicles are centrally or peripherally processed.

With the increased emphasis in engineering environmentally friendly vehicles, developing effective marketing strategies is essential to facilitate their adaption. Based on the findings, types of messages (statistical vs. narrative) have different persuasive effects. Statistical information is more effective in shaping positive attitudes and greater purchase intent towards the product. Thus, strategic communicators should develop messages about the environmental

benefits of hybrid vehicles using statistical information to enhance the effectiveness of such messages and promote greater purchase intent. .

Implications for Practice

The results from the current study provide practical implications for strategic communicators. In light of the mass-production of hybrid vehicles, it is important for market researchers to understand and develop messages to persuade the consumers. The research on the types and content of messages can provide an insight to develop an effective campaign message.

Perhaps the most important finding is the impact of statistical messages discussing the environment impact of driving a hybrid. These types of messages elicit more positive affect, positive attitudes, and greater purchase intent towards hybrid vehicles. This contradicts what was posited by the current study's first hypothesis, which predicted narrative messages would be more likely to shape more positive affect, attitudes, and purchase intent towards the product. The study assumed the narrative's ability to transport individuals would prevail over the effects of quantitative data. However, results seem to indicate people cognitively and rationally assess the environmental impact made by personal transportation. Narrative messages about the environmental impact were not as persuasive as the statistical message. It is likely that people perceive quantitative information as more credible when discussing a topic considered a social or global issue, and because cars are large budget items – compared to household cleaners or products that are not as high involving. Because people are already familiar with the environmental issue, hard facts and numerical data might seem to carry more weight than messages than narratives that appeal to emotions. Thus, this finding provides a direction for environmental campaigns to focus their campaign strategy, use statistical information to be persuasive.

The findings of the study confirm narrative and statistical messages are different in nature, and participants also perceived the content differently. When discussing hybrid vehicles, it is important to help consumers engage with the campaign or advertisement to effectively convey the message. While the overall results found persuasive effects were not statistically significant, it is still important to acknowledge the importance of different affective, attitudinal, or behavioral responses from narrative and statistical messages. When appealing the features addressing the personal benefits, such as gas mileage, it might be more effective to employ a story element to maximize the message impact. On the other hand, it might be more effective to utilize quantitative data when discussing the environmental impact of hybrid vehicles. From the findings of this study, a message comparing the percentage of harmful emissions by conventional vehicles was significantly persuasive.

This finding provides an insight to strategic communicators, as understanding what most interests the consumers is key to a successful campaign. While fuel economy is an important feature of hybrid vehicles that determine consumers' purchase decision, the environmental feature is proven to be more effective. Strategic communicators should understand the features that lead to more positive feelings, attitude, and intention to purchase the vehicle to generate an effective campaign message.

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APPENDIX A

STIMULUS MESSAGES

Clean
Vehicles

How I Learned to Stop Worrying and Love Electric Cars
David Friedman, former deputy director, Clean Vehicles
August 29, 2011

I'm going to start with a bit of a personal confession. I love hybrid cars. I've been writing, doing research, and even a little experimenting on them for two decades.

A completely unscientific look at the interest in hybrid cars tells me that I'm not alone. A Google web search for "hybrid car" comes back with 20 million hits.

There are good reasons for the excitement about hybrid cars:

First, battery cars don't need any gasoline for fuel, and plug-in hybrid electric cars only use gasoline when their batteries can't supply enough power. Hybrid cars have a lower carbon footprint when paired with natural gas as a source for electricity. Also, electric cars can truly approach zero emission status when paired with renewable power.

Add to that the quiet hum of an electric motor, the potential for great acceleration off the line, the lack of pollution from the tailpipe, and the overall high-tech "cool" factor, and you've got the potential for true love.

A co-worker just happened to email me recently about the more subtle joys of owning a hybrid. I think her words speak for themselves.

"As I sit here waiting for the drawbridge to let the tanker into the harbor, I especially love my Prius. While every other car spews exhaust–so I can't open my window–my car sits perfectly still, engine off, but at the ready to spring into action. I can't understand why anyone would be opposed to clean car technology... No brainer!!!!"

She also said she loves making an impact for tomorrow where her son and her future grandchildren can grow up with clean air. "Now I don't have to worry about my kids breathing in smog. It feels great to know what I do now helps the next generation grow up in a healthy planet. I feel like I'm doing my job as a parent."

###

Clean
Vehicles

Reducing Greenhouse Gas Emissions through Hybrid Vehicles
Samantha Roberts, director of Clean Vehicles
April 5, 2012

Transportation accounts for one third of the greenhouse gases produced in North America. In 2009, there was a total 1,849 million metric tons carbon dioxide produced by transportation alone. For each gallon of gas a car burns, it releases 19 pounds of carbon dioxide. One tank of gas (12 gallons) would burn 228 pounds of carbon dioxide.

There are about 240 million cars and light trucks on U.S. roads—that's one for every person who has a license. Those vehicles are driven 2.7 trillion miles a year—enough to make more than 14,000 round-trip voyages to the sun.

The average auto gets just over 20 mpg at 25.7 pounds of heat-trapping emissions to produce, deliver, and burn a gallon of gas. Combined, that is 3.3 trillion pounds, or nearly 1.7 billion tons of heat-trapping emissions.

How can you help reduce the harmful emissions polluting the environment or your carbon footprint?

One solution is driving a more fuel-efficient vehicle. Compact hybrid cars produce 10% fewer smog-producing emissions than their conventional counterparts. Hybrid models of mid-size cars, mid-size sport-utility vehicles, and full-size SUVs reduce smog-producing gas emissions by 15%, 19%, and 21%.

Plug-in hybrid cars (PHEVs) offer drivers the ability to charge their cars from a 120-volt power source, essentially creating a second fuel source. These cars primarily use their electric motors, with gasoline motors for backup. The gasoline engine can be used as the primary engine if no electric power is available. These cars can get over 100 miles per gallon, and produce very few tailpipe emissions.

The Electric Power Research Institute (EPRI) has shown a plug-in hybrid vehicle with a modest 20-mile electric range could save 300 gallons of gasoline, avoiding 6,000 pounds of damaging greenhouse gas emissions and reducing pollution by 38%. If you care about the environment, drive a hybrid.

###

Clean Vehicles

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David Friedman, former deputy director, Clean Vehicles
August 29, 2011

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After driving her Prius for 5 years, she was able to pay for her son's first year of college tuition. "I know it may not seem like a lot, but little goes a long way. The extra money I saved each month from driving my Prius helped me pay for my son's first year of college."

###

Clean
Vehicles

How Much Hybrids Save Your Money
Susan Brockman, former director, Clean Vehicles
October 22, 2012

Are you spending $2.55 per gallon of gas? According to the Department of Energy, the average price of gasoline in the U.S. is $2.55 a gallon. The average American spent $2,750 on gas in 2012. However, the price of electricity to charge a hybrid car only costs $1.28 a gallon. By driving a hybrid, you can save more than $800 every year.

Let's assume you drive 15,000 miles annually. The fuel costs $2.41/gallon. You would pay a little over $36,000 a year for gas. However, driving a hybrid car will save you $603. In five years, driving a 30 mpg car will save you $3,013.

More specifically, a hybrid version of 2015 Toyota Prius has a 50 mpg, whereas the non- hybrid version has 32 mpg. Hybrid cars can cost roughly $2,330 more than a non-hybrid version, and the yearly fuel savings will be $407.

Plug-in hybrid vehicles (also called PHEVs) also allow drivers to travel in all-electric mode for shorter trips, reserving the gasoline engine for longer drives. That's a feature that can boost fuel economy into 100 mpg territory. In addition to the Volt, plug-in hybrids include the Ford Fusion Energi, Toyota Prius and a version of the Honda Accord.

Hybrids are becoming more popular. For example, Ford sold 4,641 models of the Fusion Hybrid in May 2014, up 39 % from the previous year. The government also grants federal tax credits for PHEVs. You can be eligible for a federal income tax credit of up to $7,500 if you purchased a PHEV after 2010. If you want to save money, hybrids are the way to go.

###

APPENDIX B

QUESTIONNAIRE

You will be asked to read the story and complete a questionnaire. When you have finished reading the story, continue on to the questionnaire. Please **DO NOT** refer back to the story.

When completing the questionnaire, please respond to all of the items; do not leave any blank. In addition, respond to each item as if it were the only item. Do not worry about being "consistent" in your responses. Your anonymity is guaranteed and all of the information that you provide will be confidential.

Thank you for your participation. Your input is very valuable.

Please indicate which of the following statements best describes your relationship with the environment.

In competition with the environment	1	2	3	4	5	6	7	In cooperation with the environment
Detached from the environment	1	2	3	4	5	6	7	Connected to the environment
Indifferent about the environment	1	2	3	4	5	6	7	Very concerned about the environment
Not at all protective of the environment	1	2	3	4	5	6	7	Very protective of the environment
Inferior to the environment	1	2	3	4	5	6	7	Superior to the environment
Not at all passionate towards the environment	1	2	3	4	5	6	7	Very passionate towards the environment
Not respectful of the environment	1	2	3	4	5	6	7	Very respectful of the environment
Independent from the environment	1	2	3	4	5	6	7	Dependent on the environment
Disinterested in the environment	1	2	3	4	5	6	7	An advocate of the environment
Wanting to utilize the environment	1	2	3	4	5	6	7	Wanting to preserve the environment
Emotionless thinking about the environment	1	2	3	4	5	6	7	Nostalgic thinking about the environment

What is your overall attitude toward hybrid vehicles?

Bad	1	2	3	4	5	6	7	Good
Foolish	1	2	3	4	5	6	7	Wise
Unfavorable	1	2	3	4	5	6	7	Favorable
Negative	1	2	3	4	5	6	7	Positive
Undesirable	1	2	3	4	5	6	7	Desirable
Unnecessary	1	2	3	4	5	6	7	Necessary
Detrimental	1	2	3	4	5	6	7	Beneficial

The arguments presented in the message were…

Not at all persuasive	1	2	3	4	5	6	7	Very persuasive
Not at all effective	1	2	3	4	5	6	7	Very effective
Not at all convincing	1	2	3	4	5	6	7	Very convincing
Not at all compelling	1	2	3	4	5	6	7	Very compelling
Not at all clear	1	2	3	4	5	6	7	Very clear
Not at all sensible	1	2	3	4	5	6	7	Very Sensible
Forgettable	1	2	3	4	5	6	7	Memorable
Not at all believable	1	2	3	4	5	6	7	Very Believable
Not at all credible	1	2	3	4	5	6	7	Very Credible
Weak	1	2	3	4	5	6	7	Strong
Misleading	1	2	3	4	5	6	7	Straightforward
Not at all important	1	2	3	4	5	6	7	Very important

Please answer the following,

I support what the message was trying to accomplish.

Strongly Disagree   1   2   3   4   5   6   7   Strongly Agree

I totally agree with the position promoted in the message.

Strongly Disagree   1   2   3   4   5   6   7   Strongly Agree

I am favorable towards the main point of the message.

Strongly Disagree   1   2   3   4   5   6   7   Strongly Agree

Please answer the following questions.

The message included statistical information about fuel economy.

Strongly Disagree   1   2   3   4   5   6   7   Strongly Agree

The message included statistical information about an environment.

Strongly Disagree   1   2   3   4   5   6   7   Strongly Agree

The message included a story about fuel economy.

Strongly Disagree   1   2   3   4   5   6   7   Strongly Agree

The message included a story about an environmental issue.

Strongly Disagree   1   2   3   4   5   6   7   Strongly Agree

Please indicate the following.

I think the message contains facts and statistics.
Strongly Disagree   1   2   3   4   5   6   7   Strongly Agree

I think the message contains a story.
Strongly Disagree   1   2   3   4   5   6   7   Strongly Agree

After reading the message, I felt…

The information presented in the message is credible.
Strongly Disagree   1   2   3   4   5   6   7   Strongly Agree

The message is reliable.
Strongly Disagree   1   2   3   4   5   6   7   Strongly Agree

That the message is a believable one.
Strongly Disagree   1   2   3   4   5   6   7   Strongly Agree

The information presented in the message is trustworthy.
Strongly Disagree   1   2   3   4   5   6   7   Strongly Agree

That the message has integrity.
Strongly Disagree   1   2   3   4   5   6   7   Strongly Agree

How did the message make you feel about hybrid vehicles?

Not at very well at all	1	2	3	4	5	6	7	Extremely well
Passive	1	2	3	4	5	6	7	Active
Dead	1	2	3	4	5	6	7	Alive
Gloomy	1	2	3	4	5	6	7	Cheerful
Dismay	1	2	3	4	5	6	7	Delighted
Weak	1	2	3	4	5	6	7	Energetic
Sad	1	2	3	4	5	6	7	Happy
Unhappy	1	2	3	4	5	6	7	Pleased
Discouraged	1	2	3	4	5	6	7	Stimulated

Overall, I perceive the topic of the message I just viewed as …

Unimportant	1	2	3	4	5	6	7	Important
Of no concern	1	2	3	4	5	6	7	Of concern to me
Irrelevant	1	2	3	4	5	6	7	Relevant
Useless	1	2	3	4	5	6	7	Useful
Worthless	1	2	3	4	5	6	7	Valuable
Trivial	1	2	3	4	5	6	7	Fundamental
Not beneficial	1	2	3	4	5	6	7	Beneficial
Doesn't matter	1	2	3	4	5	6	7	Matters to me
Not needed	1	2	3	4	5	6	7	Needed
Insignificant	1	2	3	4	5	6	7	Significant
Unexciting	1	2	3	4	5	6	7	Exciting
Unappealing	1	2	3	4	5	6	7	Appealing
Mundane	1	2	3	4	5	6	7	Fascinating
Nonessential	1	2	3	4	5	6	7	Essential
Undesirable	1	2	3	4	5	6	7	Desirable

What is your overall attitude toward hybrid vehicles?

Bad	1	2	3	4	5	6	7	Good
Foolish	1	2	3	4	5	6	7	Wise
Unfavorable	1	2	3	4	5	6	7	Favorable
Negative	1	2	3	4	5	6	7	Positive
Undesirable	1	2	3	4	5	6	7	Desirable
Unnecessary	1	2	3	4	5	6	7	Necessary
Detrimental	1	2	3	4	5	6	7	Beneficial

I would purchase a hybrid vehicle if I had the opportunity.

Unlikely	1	2	3	4	5	6	7	Likely
Nonexistent	1	2	3	4	5	6	7	Existent
Improbable	1	2	3	4	5	6	7	Probable
Impossible	1	2	3	4	5	6	7	Possible
Uncertain	1	2	3	4	5	6	7	Certain
Definitely would not	1	2	3	4	5	6	7	Definitely would

Do you currently own a hybrid vehicle?

    1. Yes   2. No

Have you ever owned a hybrid vehicle?

    1. Yes   2. No

How long have you owned/or did you own a hybrid vehicle?

_____

What is your gender?

    1. Male   2. Female

What is your age? _____

What race do you consider yourself?

1. Caucasian
2. African American
3. Spanish or Hispanic
4. Asian or Pacific Islander
5. Native American

What is your level of education?

1. Some high school
2. High school diploma
3. An associate's degree
4. An undergraduate college degree
5. Master's degree
6. MD
7. PhD

What is your annual household income?

1. Below $25,000
2. Between $25,000 and $34,999
3. Between $35,000 and $44,999
4. Between 45,000 and $54,999
5. Between $60,000 and $74,999
6. Between $75,000 and $89,999
7. Above $90,000

Thank you for your participation. If you have any questions, please email dzl5135@psu.edu. All identifying information will be removed and will not be stored with the survey responses.

Please enter your individual worker ID for the survey code.