



Challenges of Government Communication at City Level regarding
Mobility: Breaking Habits

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Abstract

The sustainable urban mobility theme will be more and more important in everyone's life. Therefore it is important that governmental communication is increasingly aligned with their citizens. The present essay attempts to contribute to bridge the aforementioned gap within that same communication. It attempts to address the question on how governmental communication messages promotes mobility policies effectively. A crosschecking test was made between the 'Hope' and 'Risk' variables with 'Gain' or 'Loss' in the future. To enhance external validity, images and phrases correlated with the message framing were incorporated. Results showed that when the environmental issue was framed as being associated with fear and negative perspectives, there was a slight positive attitude toward the green issue, and behavioral intention more than a hope appeal did. It is concluded that the different proposed variables differ in results according to a given message framing. As a recommendation and field for further studies it is advised that governments tailor the design of their messages according to the behavior of the variables in question.

Sumário

O tema da mobilidade urbana sustentável será cada vez mais importante na vida de todos. Por isso, é importante que a comunicação governamental esteja cada vez mais alinhada com os seus cidadãos. O presente ensaio procura contribuir para colmatar a referida problemática nessa mesma comunicação, procurando responder à questão de como as mensagens de comunicação governamental promovem eficazmente as políticas de mobilidade. Foi feito um '*crosschecking*' teste entre as variáveis 'Esperança' e 'Risco' e 'Ganho' ou 'Perda' futuros. Para aumentar a validação externa, foram incorporadas imagens correlacionadas com o enquadramento da mensagem. Os resultados mostraram que, quando a questão ambiental foi enquadrada como estando associada ao medo e a perspectivas negativas, houve uma ligeira atitude positiva em relação a questões de sustentabilidade e uma tendência comportamental maior do que um apelo à esperança. Conclui-se que as diferentes variáveis propostas diferem nos resultados consoante o enquadramento dessa mesma mensagem. Como recomendação e espaço para estudos futuros, aconselha-se que os governos adaptem a conceção das suas mensagens de acordo com o comportamento das variáveis em questão.

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Chapter 1: Introduction

1.1. Background and problem statement

Urban mobility is increasingly becoming a central issue, both in the lives of citizens and in political life. In 2018, 74.5 % of the European population lived in an urban area, which is expected to increase to 84 % in 2050 (Soone, 2020). Urban centers are home to the activities that contribute most to a country's wealth and are areas where people congregate most. It is necessary to promote sustainability in these areas. And that is where urban mobility comes in with all its aspects, the main one being to end urban traffic and its consequences. However, investing in greener mobility also increases current and future economic competitiveness and social cohesion (Debyser, 2014).

Investment in mobility often does not necessarily correspond to citizens' needs. It was the case in the region of Andalucía (Spain) where a survey asking about citizens' needs was only conducted after the investment had been made. Citizens considered the investment to be insufficient and poorly channeled (Calvo-Poyo et al., 2019). Thus, government communication is crucial so that citizens can be adequately informed about the current initiatives of their city. The message must be effective and succinct since it is a policy tool (Howlett, 2009). Nor should communication be imposed by central governments without considering local needs (Harrison, 1999). The concept of persuasion also needs to be addressed. It could be analyzed by the two-way asymmetric model that states a mutual understanding, meaning that both citizens and governments may be persuaded to change their behaviors (Grunig and Hunt, 1984).

More precisely, in the field of mobility, it is a challenge for municipalities to ensure that initiatives are adhered to and that their impact is well perceived. When implementing sustainable mobility measures, there is a “need to gain public confidence and acceptability to support these measures through active involvement and action” (Banister, 2008). A Eurocities study (Eurocities, 2021) concluded that EU policymakers should (1) Recognize cities' strategic role in major transport infrastructures; (2) Take into consideration public transport and active mobility; (3) Investing in behavioral change and (4) Looking back at the last 20 months.

Mobility is in vogue these days. Municipalities are obliged to invest in complying with European directives and keeping cities at satisfactory levels of habitability. Commissioner Thierry Breton addressing cities at the ‘Smart, Green and Resilient Cities and Communities’ dialogue between EU Mayors and the Commission’ on December 2 is an example - “This transformation is a story of one generation, that’s why our goal is 2050, but we need to start now. No time to lose, just rush! We are here to come up with the right tools to make it happen” (Eurocities, 2021). However, it is not always easy to communicate with citizens so that the messages reach them and, more importantly, that they manage to change habits. The European Commission is proposing a new urban mobility initiative. Sustainable Urban Mobility Plans (SUMP) are designed to guarantee the good functioning of mobility transports and to act on improving the life quality of citizens. The guidelines and measurement of the new proposal include implementing actions to address environmental issues, such as air pollution by decreasing emissions of urban transportations. The objective is the creation of climate-neutral cities by making urban transport environmentally friendly and energy-efficient. Furthermore, it will be essential to focus on innovating the urban mobility services to increase digitalization and reach technological leadership in urban transportation. Lastly, EU funding will be more targeted and better oriented with different programs to ensure the reinforcement of this plan. An increase in awareness and engagement from citizens towards sustainable urban mobility is one of the desired outcomes of this initiative.

Therefore, I will research the direct relationship between government communication regarding mobility in urban centers and consumer behavior.

1.2. Aim and scope

This dissertation aims to analyze the most efficient types of communication that will positively affect the consumer journey. It is essential to understand the role of emotions and the feeling of winning something or losing when perceiving different message framings. It is crucial to understand the various impacts of those communication contents in consumers’ interactions and reactions across their daily lives (Grinstein & Riefler, 2015). To meet this objective, this dissertation addresses the following research question:

RQ: How can governmental communication messages promote mobility policies effectively?

1.3. Research methods

To tackle the objective of this dissertation, in my research, I use primary quantitative data that will be collected from an experiment. I will use message framing to manipulate between-participants the simulation of governmental communication. The analysis will provide results about the acknowledgment of sustainable mobility practices in an urban center and how participants reacted to the message framings presented to them specifically. It will also be measured the intentions of citizens to embrace sustainable urban mobility. The results will allow me to understand better if the framing of sustainable messages can impact mobility to be more sustainable.

I will focus mainly on people that live in urban centers, and since these are rather heterogeneous areas, it will serve as a model for analysis purposes. According to Zulauf and Wagner (2021), almost every sustainability innovation is adapted to the needs of urban areas, and they are rarely in rural areas. This is happening because cities are becoming more and more sparsely populated (Our World in Data, 2023). Therefore, as more people always equals more pollution one might assume that much of this pollution will come from the means by which these people travel, which makes the need to promote more sustainable mobility even more inevitable.

1.4. Relevance

1. This research should be important for municipalities to understand how consumer behavior changes depending on how they communicate sustainability.
2. It is relevant for companies working with B2C marketing, as they can learn about “best practices”. The conclusions of this thesis can provide guidance when companies are trying to reach a bigger audience when communicating sustainability initiatives/products to their customers.
3. Academically, this research will serve to better understand the process of identification (or lack thereof) of citizens with the communication of sustainable practices, particularly in the mobility sector.
4. For the public, the interest in mobility has been growing. People nowadays are more informed and sensitive to issues regarding climate change (Van de Velde et al., 2010). Understanding how

effectively communicating sustainable mobility benefits everyone will be definitely advantageous for all.

The dissertation is organized as follows: chapter two presents the literature review divided in both the theoretical framework and related studies used in this essay as well as laying down the study hypothesis. Chapter three acknowledges the methods, methodologies and design used to test the hypotheses and begins to analyse the collected data. Chapter four proceeds with the data analysis and tests the hypotheses. Chapter five aims at promoting a discussion to possibly fuel further investigation and, finally Chapter six concludes.

Chapter 2: Literature review

This Chapter is dedicated to presenting the current state of the art on communication of sustainable messages. Conclusions are drawn to develop the research methodology in a more sustained way.

2.1. The psychology of sustainability

This theory fits in perfectly with this dissertation because the psychological factor is perhaps the one that most affects human behaviour. All the more so when we are debating a topic like sustainable urban mobility that is not commonly thought about by the average human being due to its innovative character. This holds even more robust since Koger (2010) stated that the “planet’s serious environmental problems are really behavioral problems, caused by the collective actions of human beings and their underlying thoughts, feelings, and values; thus, the field of psychology is critical for developing and implementing solutions”.

Human psychology is complex and will never have absolute answers. This uncertainty results in the perception that actions can be taken rationally or irrationally and may even be affected by the context of the moment (Kaplan, 2000). As far as sustainability is concerned, access to information can play a determining role, generating a feeling of apprehension and helplessness. The study by

Allen and Ferrand (1999) concluded that people who feel that their behavior will not change anything are less likely to have an environmentally responsible behavior.

Also, the concept of urban mobility is not consensual, so I will use “connectivity in towns and cities that are accessible, efficient, attractive and sustainable” (Lyons, 2018). It has been highly supported within the European Union, with initiatives such as a partnership on urban mobility. A Eurobarometer survey showed climate change as the top area of public concern, meaning that mobility is a priority.

Understanding which perspective should be addressed to trigger the desired emotions is essential. Psychological negativity has been described by Kaplan (2000) as an “important determinant of sustainable actions.” Another study (Kaiser et al., 2008) concluded no direct relationship between guilt and embarrassment and pro-ecological behaviors. The way the message is crafted also influences climate change communication since “climate services require support from the field of climate change communication to effectively promote the dialogue and collaboration necessary for co-production and co-design” (Filho et al., 2018).

2.1.1. Emotions in human decision-making

The relationship between forms of communication and consumers dates back centuries ago, and the terms and conditions of this relationship have not stopped changing until now. The effect of emotions on decision making process is widely underexplored. Different neurological studies got to the conclusion that people, besides making rational judgments of the situations, also acted at an emotional level (Bechara, 2004). Additionally, this study concluded that the process of decision-making is mainly influenced by neutral substrates that, besides other things, regulate emotions. There are other researchers as Septianto et al. (2020) that concluded that some emotions such as anger and compassion influence consumer ethical judgments. Emotions should therefore be seen as something that influences consumer behavior regarding sustainable choices (Menzel, 2013). In Swedish school-class, with 12 years old students, for the discipline of Environmental and Sustainability Education was conducted a study during six weeks on their practices towards sustainability issues in food. The conclusions of the study highlighted the direct relationship between values and emotions regarding sustainable issues. (Manni et al., 2016). More specifically,

the study concluded that emotions are embedded in the students decision making process regarding those environmental issues. By so, a new formulation of getting a message through students should be implemented.

It is essential to understand the role of emotions and how they are shaped in the overall perception of sustainability. To analyze them, particularly concerning sustainability, it is necessary to go beyond the existing rationalist models of human decision-making (Menzel, 2013). How should we read emotions when we talk about communicating sustainability?. And how should politicians act accordingly? “It is important to develop authentic, honest communications strategies” (Chapman et al., 2017).

It is fundamental to understand how emotions act in everyday people's lives. Education is the primary driver of emotional reactions towards everything, and it is imperative regarding sustainability (Dettori et al., 2017). Furthermore, Dettori et al. concluded that critical rethinking of the educational system is needed to give young people the necessary tools to form their cognitively sustainable oriented self. Beyond these variables, a posteriori, it is relevant to understand the relationship between human behavior and the socio-physical components of the environment (Ibarra et al., 2020). In this article, the findings were that “the presence of certain psychological characteristics in people would promote a closer relationship with nature, which could encourage participation in caring for the environment.”

Also, there is a link between positive emotions and sustainability, to the extent that sustainable behavior is guided by positive dispositional factors and benefits, as Baumeister; Bratslavsky; Finkenauer; Vohs (2001) argued.

2.1.1.1 The Feeling of Hope

The feeling of hope is not consensual and therefore not easy to define. C.R.Snyder (2000) stated that hope is constructed when there is a positive agency and that is channeled to specific goals or is constructed by a successful cognitive set to aim specific objectives. It can also be defined as the production of pathways to achieve something and self-motivation to follow those same paths (Snyder and Lopez, 2005).

Hope can be very useful to analyze human behavior in various areas. The well-being of a person is more affected by hope than by positive expectations (Pleeging et al., 2021). Additionally, in other studies, it was found a positive relationship with the feeling of hope and academic-related outcomes (Marques et al., 2017). It was also verified by Yi Ding (2019) that hope played a role in the formation of a continuous intention when dealing with technology means, specifically mobile apps. Also, social changes happen often when people acknowledge that their actions are limited by forces that they can not control (McGeer, 2004).

Regarding the environment, the relation is not clear within the author's experimental environmental ethics classroom, arguing that hope can not be separated from all the processes of planning and having clear objectives (Sheppard, J., 2004). Additionally, he raised the hypothesis of triggering hope when intending to change the environment for the better, a perspective called meliorism. Thus, labeling systems are important for modeling the feeling of hope (Courville, S., & Piper, N, 2004). To sum, the study of the interference of hope in pro-environmental decisions is needed.

2.2. Behavioral change

Due to these factors, human behavior itself is complex and hardly predictable (Cziko, 1989). The gap attitude-behavior (Gupta & Ogden, 2006) indicates that although there is a greater willingness to pay for sustainable products, there remains a gap between attitude and behavior. Furthermore, this study found that individuals can express an environmental perspective, however, that does not translate into changing behaviors towards that eco-friendly concern. There is a positive impact of value orientation on the attitude regarding eco-friendly products (Khoiriyah & Toro, 2013). In addition, this research concluded that this green attitude has a strong influence on the consumer's willingness to pay, which will lead to purchasing environmentally-friendly products. Although individuals may form the idea of acting towards sustainability, White and Simpson (2013) concluded that consumers tend to resist actions that will require additional time and effort.

This thesis aims to understand the behavior of people towards sustainable urban mobility. It will be possible to discuss if people become more environmentally conscious and understand the variables that generally influence that. Although people are free to make their environmental decisions, they are often influenced by other aspects of their lives (Clayton et al., 2013). One of the main factors affecting a person's behavior towards sustainability is how the communication of the initiatives is made. Those communications strategies are directly linked with the message framing used. This thesis examines how message frames can be more effectively tailored to encourage environmentally sustainable behaviors within urban centers.

2.2.1. Theory of planned behavior

In 1980, the Theory of Planned Behavior (at that time, it was called Theory of Reasoned Action) was mainly developed to forecast an individual's intention to participate in an activity at a specific location and time. This theory was designed to explain and characterize the automatic actions, that is, all actions that do not require the sense of self-control. Of this development, the most vital component to consider is behavioral intention. This component is characterized as the will and how an individual acts when faced with a decision. Behavioral intention, more specifically, the intention to act in a certain way, is naturally influenced by the probability that the activity will meet the desired and preferred outcome, causing the behavioral intention to change from the assessment made to the outcome (Ajzen, 1991).

Theory of Planned Behavior is perhaps one of the most well-developed theories that describe whether attitudes, social norms, and perceived behavioral control impact behavioral intentions in behavior (Ajzen, 1991). This concept emphasizes motivational elements as predictors of specific conduct, incorporating the feelings of perceived behavioral control over the specific activity (Madden, Ellen, & Ajzen, 1992). According to the notion of planned behavior, the more resources, and possibilities one individual believes s/he has, the stronger its perceived control over one specific activity (Ajzen, 1985). People's attitudes, subjective norms, and perceived behavioral control are included in the list of factors of individuals' intents and the likelihood of executing the specific action. Even though the Theory of Planned Behavior has been widely used in describing many aspects of human behavior through the years, it has received multiple critiques for having

insufficient predictive power and just using three components to predict behavioral intention.

2.2.2. Prospect theory

The Prospect Theory was developed by Kahneman and Tversky (1979). Prospect theory is one of the most prominent theories in behavioral science, particularly in studies on risky decision-making. This theory, which relates to human decision-making under uncertainty, is regarded by Shiller (1999) as probably the theory with the most significant influence in finance. Regarding the great comparison made by Kahneman and Tversky (1979), it focuses essentially on the Von Neuman-Morgenstem Theory (Theory of Utility), arguing that the choices that individuals make in risky situations have a variety of characteristics, which are incompatible and inconsistent with the theory of utility (Edwards, 1996).

Besides this, Kahneman and Tversky (1979) have advanced the field of behavior change. They concluded that participants who faced a choice between different perspectives, as a rule, tend to ignore and do not consider specific characteristics to be the same among all, i.e., they commonly ignore characteristics in between all the perspectives. Ignoring identical elements is called the isolation effect, which has consequences at the level of framing a perspective, which can change a person's choice. Furthermore, Kahneman and Tversky (1979) found another phenomenon in the decision-making process: the reflection effect, the equivalence of choice involving negative and positive perspectives. This means that choices between negative views mirror choices between positive perspectives (Holmes et al., 2011).

Regarding the great comparison made by Kahneman and Tversky (1979), it focuses essentially on the Von Neuman-Morgenstem Theory (Theory of Utility), arguing that the choices that individuals make in risky situations have a variety of characteristics, which are incompatible and inconsistent with the theory of utility (Sun, Polman & Zhang, 2021).

Those risky decisions have *sui generis* associated factors, for instance, and as argued by Polman and Wu (2019), people take riskier decisions when involving others than they do when it involves themselves. Also, according to Weber and Johnson (2009) depending on who is taking the

decision is familiar with the domain will take riskier decisions and experience positive emotions, vice-versa. This human behaviour associated with risk leads to the need of scrutiny of those same behaviours.

2.2.3. Message framing

Persuasive communication and pro-environmental behaviors: Message tailoring and message framing can improve the integration of behaviors through self-determined motivation. Pelletier and Sharp (2008) stated that the way an audience responds to a particular message depends on the content of the message as well as how it is received. Message framing has been described as a technique used to construct meaning and shape perceptions of the outcomes of the promoted behavior, which presupposes that the way an audience responds to a particular message can depend on how the message is composed and subsequently encoded by the recipient (Davis, 1995; Pelletier & Sharp, 2008).

According to Rothman & Salovey (1997), message framing refers to the technique of manipulating the receiver's perceptions of the outcomes of behaviors in terms of its benefits (gains) or costs (losses). A loss-framed message would highlight the disadvantages of not adopting the target action, while a gain-framed message will emphasize the benefits of the target action (Meyers-Levy & Maheswaran, 2004). Regarding which of these approaches is more effective, the overall picture is still unclear. On the one hand, prior research suggests that because of a more sensitivity towards loss aversion, negatively framed messages tend to be more effective than positively framed ones (Cheng et al., 2011; Kahneman & Tversky, 1979; Meyerowitz & Chaiken, 1987). It has been defended that people tend to dislike losses more than equivalent gains because of the well-documented negativity bias in our attention where "negative information exerts a greater impact on judgment than does objectively equivalent positive information" (Meyerowitz & Chaiken, 1987, p. 501). On the other hand, Cheng et al. (2011) explained that the effectiveness of each frame depends on the message subject and the audience, showing that a gain-framed message can be compelling as well.

In addition to the frames mentioned, other forms of message framing are also relevant, such as images and the use of emotions in the message content to create an impact to lead to behavior change. Research in the communication literature has proven that different images in frames can produce distinct emotional responses that influence subsequent judgments and decisions (Iyer et al., 2014; Powell et al., 2015). According to Septianto and Lee (2020), image and message framing can be combined effectively when they have congruent construal levels; in addition, distinct emotional responses to images can lead to differential influence on consumer decision making. Moreover, to the frames mentioned, there are other forms of message framing that are also relevant, such as images and the use of emotions in the message content to create an impact to lead to behavior change. Research in the communication literature has proven that different images in frames can produce distinct emotional responses that influence subsequent judgments and decisions (Iyer et al., 2014; Powell et al., 2015). In accordance with Septianto and Lee (2020), the image and message framing can be combined effectively when they have high construal levels, in addition, distinct emotional responses to images can lead to differential influence on consumer decision making, meaning that, when dealing with people with low construal levels, those persons were more inclined to value more products with an everyday low price, rather than an everyday value per se.

The importance of message framing has been highlighted in previous research for being a technique that can substantially enhance the success of social marketing campaigns when used in combination with a specific target audience (Cheng et al., 2011).

2.2.4. Construal level theory

Construal level theory (CLT) is a theory in social psychology that explains how psychological distance influences mental representation, judgment, and choice (Liberman & Trope, 1998; Trope & Liberman, 2010). According to this theory, the more psychologically distant an object or event is from the individual, the more abstract the construal is. In contrast, the closer the thing is, the more concretely it will be thought of. The psychological distance can vary in terms of temporal distance (time), spatial distance (physical space), social distance (interpersonal distance), hypothetical distances (probability, imagining that an event is likely or unlikely), or any dimension that removes consumers from focusing on themselves in the here and now (Bar-Anan et al., 2006).

CLT assumes that any action can be seen at multiple levels of abstraction, suggesting that individuals tend to represent psychologically distant events by the essential, abstract, and global characteristics, looking at the big picture (high-level construal) and psychologically close events by the peripheral, detailed, concrete, and local resources (low-level construal) (Fujita et al., 2006). Actions with a low level of construal would specify “how” people do things, indicating the process associated with conducting a specific, measurable activity, while actions with a high level of construal deal with “why” people do things, explaining the reasons for such actions (Lee & Oh, 2014; Zhu et al., 2017). According to Liberman et al. (2002), changing the psychological distance of objects or events affects peoples’ mental representation of them.

Recent research has pointed out that CLT can be a helpful framework to investigate the sustainability communication process and its persuasion (Teng & Chang, 2014; Line et al., 2016; Lee & Oh, 2014). For instance, Teng and Chang (2014) showed that temporal distance positively promotes eco-friendly hotel programs. Line et al. (2016) demonstrated how temporal, social, and spatial distance influences consumer-level interpretations of an organization’s sustainability message. In the same vein, Lee and Oh (2014) proposed that CLT can be applied to develop effective communication messages in sustainability.

White, MacDonnell and Dahl (2011) demonstrated in their research that the combination of construal level messages with gain or loss-framed messages enhanced the likelihood of sustainable behaviors, elucidating when loss versus gain-framed messages is most effective in influencing consumer recycling by investigating the moderating role of whether a more concrete (low-level construal) or abstract (high-level construal) mind-set is activated. First, the authors demonstrated that loss-framed messages are most effective when combined with low-level concrete mindsets. In contrast, gain-framed messages are most effective when combined with high-level abstract attitudes. Additionally, they found that “where a pairing of framed loss (gain) messages that active more concrete (abstract) mental configurations lead to greater processing fluency, greater efficiency, and, as a result, more positive recycling intentions” (White et al., 2011, p. 1).

2.2.3.1 Type of threat in message framing

The content of messages can be designed to reach the recipient of gains and/or losses in different ways. A commonly used strategy in social marketing is fear appeals. Fear is the intended emotional response to the danger that the threat expresses, or at least implies (Tanner, Hunt & Eppright, 1991). There are two types of threats, social threat, and physical threat. This strategy has been studied over the past few decades and has been supported by research aimed at understanding how consumers perceive, process, and react to messages that contain threatening information and how these appeals can persuade them to change their behaviors. (Donovan & Henley, 1997).

Several studies have demonstrated the effectiveness of fear appeals in influencing behavior change. Most of the existing research on social and physical threats is related to health behaviors. Wiley et al. (2002) found that young people tend to relate more favorably to social threats than to physical threats. Schoenbachler and Whittler (1996) demonstrated that social threats, which rely on messages of social disapproval, are more persuasive than physical threats in communications about adolescent drug use. Furthermore, studies of emotional arousal, such as fear, have shown its significant role in influencing behavior. Fear of punishment or disapproval results in avoidance of behaviors that would lead to any of the consequences, so both cognition and emotional arousal interact to influence behavior (Coke, Batson, & McDavis, 1978).

In environmental communications the message is typically designed to reach the audience highlighting the relationship between the advocated behavior and the physical environment or by highlighting the physical threat related with the behavior. The concept of social and physical threats is derived from similar threat types used in fear resources. Although the term “threat” usually carries negative connotations, “physical threat” does not necessarily have unfavorable consequences, being any outcome that emphasizes the physical environment as the main beneficiary of the behavior. On the other hand, “social threats” refer to the benefits or costs of behavior that are associated with the self in relation to others. Framing factors and threats interact to influence environmentally sustainable behavior, and both must be considered when designing messages for social marketing campaigns (Cheng and Woon, 2010). In a study based on reported driving intentions in a group of adolescents, Cheng and Woon (2010) found that, comparing genders, social threats ads may be more effective for females, which is consistent with studies that

demonstrated a stronger peer influence in females (Abernathy, Massad, & Romano-Dwyer, 1995; Bird & Tapp, 2008; Kobus, 2003).

2.3. Government communication

Communicating sustainability has become more difficult and complex because people have become more aware of what is going on with major brands, organizations, or governments. Public communications have a significant role in making the disclosure of important information with a format that should be clear and understandable. (UNEP, 2005).

It is not an objective term, but government communication was defined as a policy tool or instrument to affect policy objectives (Howlett, 2009). This instrument has been described as “one of the most important government functions” (Liu, Horsley & Yang, 2012). Fairbanks, Plowman, and Rawlins (2007) stated that the messages must be transparent. However, communicating sustainability is something *sui generis*, as eight attributes were identified by Liu and Horsley (2007) that affect government public relations.

One definition that is used is from the book “Sustainability Communication - Interdisciplinary Perspectives and Theoretical Foundation” by Godemann and Michelsen (2011) as the function of “critically evaluating and introducing an understanding of the human-environment relationship into social discourse.”

Through randomized controlled experiments (Reynolds et al., 2020) concluded that when governments are communicating, they should try to emphasize the evidence and effectiveness that supports the specific policy decisions. The understating of people’s values and objectives should also be reflected in policymakers’ choices.

The usage of digital means must be addressed as essential as “society and key strategic partners bit by bit set higher communication standards as well as expectations towards civil service experts and their communication style” (Laužikas & Miliūtė, 2020). To improve digital commitment, municipalities should create specific media departments and provide funding (Laužikas & Miliūtė, 2020). Nevertheless, when using information and communication technology (ICT) to persuade

sustainable behaviors, there is always a question of ambiguity (Majeed, 2018). He concluded that although ICT can be used for the benefit of the planet, especially regarding communication and awareness, that is only valid for developed countries.

Government communication was defined as a policy tool or instrument to affect policy objectives (Howlett, 2009). This instrument has been described as “one of the most important government functions” (Liu, Horsley & Yang, 2012). The publication from UNEP (2005) lists the main challenges faced by national and local authorities: changes in administration can change priorities for communication; consistency between words and action is critical; using jargon will not interest the public, and lack of funds is a constraint. In that UNEP publication, it is also stated that government eco-friendly communication should be positive and tailored to different social contexts.

One of the definitions used was taken from Godemann and Michelsen’s book (2011) as the function of “critically evaluating and introducing an understanding of the human-environment relationship into social discourse.” The publication “Communicating Sustainability: How to produce effective public campaigns” (UNEP, 2005) lists the main challenges faced by national and local authorities: changes in administration can change priorities for communication; consistency between words and action is critical; using jargon will not interest the public, and lack of funds is a constraint.

2.4. Overview and hypothesis formulation

The findings of this literature review are briefly summarized. Based on the literature above, I aimed to verify the effect of hope-oriented messages, framed as a loss vs. a gain would trigger more pro-environmental behaviors towards mobility.

Although public policy is used to help citizens to promote healthier and more sustainable behaviors, not often is succeeded. It seems complicated to communicate with citizens, and this research aims to investigate more effective ways to design communication messages. One format is the way messages are framed. When people expect to have the outcomes of their decisions over a period of time, they can develop more risk aversion (Fehr-Duda & Fehr, 2016). Therefore, framing messages in terms of the risk is probably more effective to promote more sustainable behaviors. In sum, it is

predicted that when hope-oriented messages are framed as loss (vs. as a gain), people adhere more to environmentally friendly behaviors such as using urban sustainable mobility solutions more often.

Consequently, to analyze these predictions the following hypotheses were formulated:

H0₁: There is no difference between message framings in terms of risk and hope on willingness to pay for a more sustainable urban mobility.

H1a: There is a difference between risk message framing (losses vs. gains) on willingness to pay for a more sustainable urban mobility.

H1b: There is a difference between hope message framing (hope vs. no hope) on willingness to pay for a more sustainable urban mobility.

H1c: There is a difference between risk message framing (losses vs. gains) when combined to hope message framing (hope vs. no hope) on willingness to pay for a more sustainable urban mobility.

H0₂: There is no difference between message framings in terms of risk and hope on willingness to use a more sustainable urban mobility.

H2a: There is a difference between risk message framing (losses vs. gains) on willingness to use a more sustainable urban mobility.

H2b: There is a difference between hope message framing (hope vs. no hope) on willingness to use a more sustainable urban mobility.

H2c: There is a difference between risk message framing (losses vs. gains) when combined to hope message framing (hope vs. no hope) on willingness to use a more sustainable urban mobility.

H0₃: There is no difference between message framings in terms of risk and hope on sustainable awareness.

H3a: There is a difference between risk message framing (losses vs. gains) on sustainable awareness

H3b: There is a difference between hope message framing (hope vs. no hope) on sustainable awareness.

H3c: There is a difference between risk message framing (losses vs. gains) when combined to hope message framing (hope vs. no hope) on sustainable awareness.

These hypotheses will be the main object of study of this research. Learning more about these hypotheses will be relevant to understanding how government communication can be improved to reach a higher number of citizens and what type of consumers are more predisposed to engage in sustainable mobility.

Chapter 3: Research Methodology

3.1. Research approach

According to Saunders et al. (2009), three different types of research proposals can be identified. First, the exploratory approach seeks to define a new topic or angle that has never been studied before. It is the initial research into a hypothetical or theoretical idea. Secondly, the descriptive analysis attempts to explore and explain in detail an existing matter. Lastly, explanatory research is when sufficient information about a current topic and further determining the relationship between variables is needed.

This dissertation carried out a descriptive approach to determine whether government communication changes the engagement of citizens regarding urban mobility. In addition, a quantitative approach will be used to collect more detailed results about the relationship between specific communication messages and consumers' responses.

3.2. Data collection

Primary data was collected through an online experiment and later statistically analyzed. The goal is to determine the effectiveness of communication of sustainability messages and therefore improve citizens' living conditions in urban centers towards more sustainable cities.

This study tested the persuasive effect of loss and gain-framed crossed with the message on consumer intentions of embracing sustainable mobility solutions and the moderating role of having hope vs. no hope.

The data were cross paired between the loss and gain frame with the existence or absence of hope. The study was run through a Qualtrics questionnaire in October 2021. I used four manipulated conditions (See figures 1 and 2). One hundred and twenty-seven participants took part in the study, started by reading and agreeing to the consent form. Seventy-six responses were collected with an average age of participants of 25.56 years (25.41 average of female participants and 25.67 average of male participants). For the sake of the presented hypotheses, I decided to collect answers only from participants who lived in an urban center.

3.3. Design and procedure

Four informational messages were designed to manipulate message framing. To manipulate risk frame, the messages were framed as describing a loss in the future (N = 38) or describing a gain in the future (N = 38) when adopting sustainable alternatives to urban mobility. Similarly, to manipulate hope frame, participants either saw the message written in a format that was hopeful about the future (N = 36) or a neutral message format (N = 40) (see Figures 1-2).

1 By not embracing urban sustainable mobility, we will increase greenhouse gas emissions

2 If we do not look for more sustainable alternatives to commuting within cities, there will be a lower demand for tourism, since people are more and more eco-friendly

3 We will lose the potential available public space, because cars occupy too much space



1 By embracing urban sustainable mobility, we will decrease greenhouse gas emissions

2 If we look for more sustainable alternatives to commuting within cities, there will be a higher demand for tourism, since people are more and more eco-friendly

3 We will gain the potential available public space, because cars occupy too much space



Figure 1 – On the left, manipulation of message frame, *Loss and No Hope* condition; on the right *Gain, No Hope*

1 By not embracing urban sustainable mobility, we hope to increase greenhouse gas emissions

2 If we do not look for more sustainable alternatives to commuting within cities, there is an expectation for a lower demand for tourism, since people aspire more and more to eco-friendliness

3 We anticipate to lose the potential available public space, because cars occupy too much space



1 By embracing urban sustainable mobility, we hope to decrease greenhouse gas emissions

2 If we look for more sustainable alternatives to commuting within cities, there is an expectation for a higher demand for tourism, since people aspire are more and more eco-friendliness

3 We anticipate to gain the potential available public space, because cars occupy too much space



Figure 2 – On the left, manipulation of message frame, *Loss and Hope condition*; on the right *Gain, Hope*

Procedure

This study was conducted using the Qualtrics’ online questionnaire. In the beginning, they answered a control question of whether participants lived in an urban center, and if not, the survey would be finished. After that, respondents were randomly assigned to one of four treatment conditions - gain-hope; gain-no hope; loss-hope; loss-no hope - as illustrated in Figures 1-2. Then, they were asked to rate their agreement on three sentences measuring “knowledge”, “intention” and “willingness to pay”.

3.2.1. Dependent Variables

“Knowledge”: (1) I feel that by embracing sustainable urban mobility can make a difference; (2) I feel that I know the city programs about sustainable urban mobility; (3) I believe that I know which

steps I would need to take to use eco-friendly urban mobility. After that, I measured “intention” composed of three questions - “How willing are you to use cities initiatives regarding sustainable urban mobility?” or “How likely would you embrace your cities initiatives regarding sustainable urban mobility?” and questions of an acknowledgment as “I feel that I know about my city initiatives regarding mobility.” Lastly, I measured willingness to pay for a program of sustainable urban mobility.

3.2.1.1. Willingness to pay for a sustainable urban mobility program

A single item was used to measure willingness to pay for a sustainable urban mobility program to be installed in the participant’s city (*How much would you be willing to pay to use a more sustainable way of commuting, per month, within your city?*). Values started in 0€ up to 100€ per month.

3.2.1.2. Willingness to use sustainable urban mobility initiatives

To understand the intentions of using urban mobility programs that are more sustainable, two other items were used to measure this concept: (1) “How willing are you to use cities initiatives regarding sustainable urban mobility?”, ranging from 1 (not at all) to 7 (extremely); (2) “How likely would you embrace your cities initiatives regarding sustainable urban mobility?”. ($r = .454, p < .001$), ranging from 1 (extremely unlikely) to 7 (extremely likely).

3.2.1.3. Sustainable awareness regarding urban mobility

To understand the level of acknowledgment of the participants regarding urban sustainable mobility: (1) *I feel that sustainable urban mobility can make a difference*; (2) *I feel that I know about my city initiatives regarding mobility*; and (3) *I believe that I know what steps I will take to use sustainable urban mobility* ($\alpha = 0.638$), ranging from 1 (strongly disagree) to 7 (strongly agree).

Chapter 4. Results

4.1. Willingness to pay for a sustainable urban mobility program

To test my main hypothesis, that message framing affects willingness to pay for a sustainable urban mobility program, I conducted a Univariate ANOVA (*Analysis of Variance*) entering risk frame and hope frame as between-subjects factors, and willingness to pay as the dependent variable. Results revealed a main effect of risk frame ($F(1, 66) = 4.38, p = .040$), where participants in the loss frame reported higher willingness to pay for a sustainable urban mobility program ($M = 38.53, SD = 15.06$) than participants in the gain frame message ($M = 30.69, SD = 15.41$). No other effects were statistically significant (main effect of hope frame: $F < 1, p = .451$; interaction effect of risk \times hope frame: $F < 1, p = .682$).

4.2. Willingness to use sustainable urban mobility initiatives

To test my second hypothesis, that message framing affects willingness to use a sustainable urban mobility program, I conducted a Univariate ANOVA (*Analysis of Variance*) entering risk frame and hope frame as between-subjects factors, and willingness to use as the dependent variable. No significant differences were found between the factors and the willingness to use a sustainable urban mobility program (main effect of risk frame: $F < 1, p = .483$, main effect of hope frame: $F < 1, p = .334$; interaction effect of risk \times hope frame: $F < 1, p = .516$).

4.3. Sustainable awareness regarding urban mobility

To test my third hypothesis, that message framing affects sustainable awareness regarding a sustainable urban mobility program, I conducted a Univariate ANOVA (*Analysis of Variance*) entering risk frame and hope frame as between-subjects factors, and sustainable awareness as the dependent variable. Again, no significant differences were found between the factors and the sustainable awareness regarding a sustainable urban mobility (main effect of risk frame: $F < 1, p = .388$; main effect of hope frame: $F < 1, p = .380$; interaction effect of risk \times hope frame: $F < 1, p = .200$).

Chapter 5 – Discussion

The results from the Univariate ANOVA showed that the risk frame has a statistically significant influence over consumer s' willingness to pay for an urban sustainable mobility program and therefore this hypothesis fails to be rejected. The only statistically significant mean difference found was between loss frame and gain frame content, showing that the first raises higher willingness to pay in the collected sample. One explanation for this can be the problem of temporal discounting that will be individually analyzed.

This is in line with Prospect Theory assumptions, where Kahneman and Tversky (1979) have concluded that people who have to make a choice between several perspectives they ignore or do not consider characteristics in common between all the perspectives (isolation effect). Moreover, according to the this theory, people evaluate gains and losses differently, giving perceived gains a higher priority than perceived losses (i.e., in a concrete example, a person who faces two options that are equal, s/he will pick the one with the highest prospective gains. Also Rawls (colocar referência) stated that “there are good reasons to expect that rational persons are to some degree risk-averse” as confirmed in the present essay.

Regarding sustainability, the feeling is not always easy to interpret as, for example it may differ from the other consumer, financial and life-and-death problems (Lepore and Cunningham, 2022). Also, in the article “An Optimal Compensation Agency Model for Sustainability under the Risk Aversion Utility Perspective” by Lin and Liu (2021), is studied how should be defined the compensation for sustainability considering risk aversion utility on revenue. Even for governments, that is a issue, as they are loss averse when considering to intiiate a sustainbality initiative (Deslatte, Swann and Feiock, 2020).

Given those sources of explanation, it is possible to correlate this theory with the concrete examples we have obtained in the results (participants felt more inclined to pay for a mobility program when the message was framed as loss, than when was framed as gain). Hence, people are more committed and focused on not losing things, than on gaining new things. Thus, people today prefer not to lose the things they already have as acquired, than to gain things, objects, experiences and many other new things. Nowadays, mobility initiatives are increasing due to supramentioned factors. This

results in the need that the messages that reach citizens have to be more efficient, as demonstrated in prior theories and on the present dissertation. Therefore, messages should be as targeted as possible. If one is trying to communicate a campaign for the elderly, the tools used need to be different than the ones used for a campaign for younger generations. They cannot be a one size fits all solution. All these messages should be based on emphasizing some type of loss, for instance, if people do not use sustainable means of transportation within cities this will lead to a further loss in time in their lives due to the reduction of traditional roads (due to expansion of public transportation networks) or even disappearance for walking routes.

In relation to the "willingness to use sustainable urban mobility initiatives" there was no effect neither with loss or gain. This holds due to the inexistence of immediate and palpable effects. Municipalities can address this by creating immediate benefits to the use of these solutions.

When talking about the "sustainable awareness regarding urban mobility" there were also no effects due to the priorities on one's life. If there is a pecking order on people's priorities, even though environmental concerns are becoming more pressing they are still at a relatively low level of salience, thus resulting in the drawn conclusions.

Regarding the hope frame, it is possible to conclude that there are not significant effects to consider. Analysing the reality that the hope frame had no effect on the respondents' behaviour, it is possible to associate this effect to the fact that, since the issue of sustainability is such a serious, present and fracturing issue in our society, that when we talk about such serious issues as sustainability, a hopeful approach seems not to work. The main reason has to do with the connection with a theoretical background. There is no direct and concrete action or impact on these issues when delving on the science serving as a basis for the change. A further liaison to science, namely by governments, that clearly demonstrate a connection with people's lives this could be a solution. Therefore, since it proves to be such a crucial issue in our society, perhaps an approach of threat, or fear, is more appropriate in order to really understand its effect. It is essential to understand the meaning of information for the people seeing it (Hall, 2014). In the context where the environmental concern was presented on a global scale, it was observed that a fear appeal had a more pronounced impact on viewers, fostering increased attention, a positive attitude towards the

environmental issue, and a greater behavioral intention compared to a hope appeal. As shock normally leads to action through a negative reinforcement it is easier, therefore, to produce some type of change within this route (Chen, Chang and Lee, 2017).

5.1. Temporal discount and sustainability

The advent of a variety of modern society worries about sustainability has pushed ecologically responsible behavior to the top of people's priorities. Citizens' readiness to become more environmentally conscious and responsible in their everyday lives is expanding at an unprecedented rate (Trudel, 2018). Individual involvement in environmentally sustainable lifestyle activities is expanding nowadays. This increased participation has been established mostly because of the great activity of governments, non-governmental groups, and, most importantly, the massive diffusion of this attitude through social networks. Social networks have helped as a communication bridge for individuals to fully engage in the adoption of common practices connected to the conservation of the planet (Prothero et al., 2011).

Despite people's active participation in establishing an ecologically friendly attitude, there are several elements that impact the act of putting into practice the many acts required to live an environmentally friendly lifestyle. One of these factors is the perception in the understanding and perception of future events (Farias et al.; 2021).

Humans have a strong preference for short-term, tangible goals that can be immediately identified as a goal. Thus, when applying this behavioral tendency to humans and relating it to environmentally friendly behavior, it is possible to define humans preference to choose actions and behaviors that are tangible and have an end goal that can be understood and observed, as opposed to actions and behaviors that are intangible and have no end goal (Deci & Ryan, 2000). This tendency can be defined as Temporal Discounting, which according to Farias et al. (2021) can be defined as a "tendency of people to prefer immediate desire instead of waiting for the future outcomes, even though the immediate reward or gratifications would still outweigh the delayed gain or gratifications".

Applying this concept to everyday life, according to Rick and Loewenstein (2008) the analysis made by human beings at a moment of decision is related to the costs and benefits that come from a decision, influencing the outcome of that same decision. For example, the act of running 5 km, always comes from a decision process in which the benefits (getting healthier, losing weight, feeling better prepared, among others) overlap or not (depending on the outcome of the decision) with the costs of running (risk of injury, increased fatigue, muscle pain, among others) (McClure et al., 2007). This decision process does not only occur in the act of going running. It also occurs at the time of decisions related to an environmentally friendly lifestyle. As an example, when deciding to start recycling garbage at home, the benefits are analyzed (for example, recognizing that we are being more environmentally friendly), as well as the costs (the added work of constantly having to recycle products). However, the problem, in this case, is that the benefits are unquantifiable and intangible since we do not receive higher rewards for recycling, we do not work fewer hours, nor have more tax benefits, but we contribute to the development of a more sustainable and environmentally friendly planet. Thus, we can consider that human beings enter inertia processes when they are not able to recognize and identify the outcomes of a decision or a process of behavioral change (Farias et al., 2021).

Nonetheless, despite the people's propensity to make choices and alternatives with more concrete effects, the means of communication enable the spread of knowledge about the genuine and catastrophic issues that our world is facing. Furthermore, these tools allow us to measure and disseminate the actual costs of issues like global warming and pollution (Carpenter et al., 2016). As a result, people's active engagement in implementing a sustainable lifestyle is expanding, as it is becoming increasingly clear that a change in lifestyle, such as beginning to recycle or reuse some things, dramatically helps our world (Gao et al., 2018). Environmental risks are a sui generis type of risks when considering the impact on the perceived consequences (Gattig and Hendrickx 2007).

Chapter 6 - Conclusion

Considering that people find it easier to perceive loss and struggle to comprehend the risk of something happening in the distant future, it would be preferable to implement measures with future predictability models based on data/studies. However, as demonstrated in this thesis, messages need to be short, concise, and informative. Therefore, there must be a selection process based on the characteristics of the site/population of the municipality to choose the most effective message.

For citizens, it is important to understand that in a world where companies are more connected to sustainability due to mediatic pressure or governmental pressure, these holds since they do not adapt to a sustainable way of life they will, invariably, be left behind. Therefore, citizens should enlarge their perspective in order not to change only when there is negative reinforcement but also that the positive reinforcement is grater now than in the future as it will evolve as marginally diminishing as society moves more towards sustainability.

For Governments it is concluded that the messages with the best results are the ones that present themselves as a negative reinforcement. However, it is not always viable to present these imagery at a reputational level. Therefore, governments, as afore mentioned, should understand that message framing and designs should be targeted and efficient and not standardized for everyone. At the moment, a possible solution could be a more illustrative message that shows positive and negative effects in a ludic and softer way.

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