UNIVERSITA' DEGLI STUDI DI PADOVA

DIPARTIMENTO DI SCIENZE ECONOMICHE ED AZIENDALI "M.FANNO"

CORSO DI LAUREA MAGISTRALE IN BUSINESS ADMINISTRATION

TESI DI LAUREA

"The Narrative Ripple Effect: Investigating the Role of Narrative Persuasion on Pro-Environmental Awareness and Risk Cognition"

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MATRICOLA N . 2014390

ANNO ACCADEMICO 2022 – 2023

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Firma dello studente

Acknowledgments

It is imperative to acknowledge the fact that I was not alone in this process, and that the motivation and encouragement of the people close to my heart was crucial for the establishment of my dissertation. I dedicate this thesis to my dear mom, the most important person in my life. She always encouraged me to pursue a university degree, and without her dedication and guidance, I would not be in this position I am today. I hope she is proud of my progress and my achievements, as much as I am proud to be her son.

I am grateful to my family and friends for their extensive support throughout these past two and a half years, which were filled with a variety of emotions and spurred by many obstacles both personally and professionally. It is difficult to put into words how much their support means to me and the tremendous impact it has on me. To my family back home, (my supportive dad, my beloved sisters and my amazing niece), as well as to my family here in Italy, (my fantastic cousins and compassionate aunt), your support goes never unrecognized. In addition, I also want to express my gratitude to my girlfriend, my biggest believer and ultimate supporter. She stood by my side since the beginning, consistently believing in me no matter what, and for that I am forever indebted and grateful.

Furthermore, I want to articulate my sincere appreciation to my professor. His guidance and expertise were detrimental to the progress of my dissertation, and It was an honor and pleasure to work alongside him and have the opportunity to learn so much from a respected professional.

Abstract

Narrative persuasion has emerged as an effective tool for influencing individual's attitudes, beliefs, and behaviors. This thesis is centered around the intricate relationship between narrative persuasion, storytelling elements, and pro-environmental awareness and risk perception. Through a review of relevant literature of existing research and theoretical frameworks, this study aims to comprehensively investigate the role of narrative messaging and storytelling techniques in fostering sustainability behavior by promoting and engaging in pro-environmental initiatives. Moreover, this thesis strives to contribute to the development of compelling narrative interventions, identifying key storytelling elements and their persuasive potential.

By conducting a meticulous statistical analysis of a dataset obtained from a survey addressing the environmental hazard of flooding and the associated risk it poses, this study presents robust evidence indicating that narratives incorporating victim messaging concerning this environmental hazard elicit a significant increase in negative affective responses among female participants. This outcome emphasizes the importance of narrative framing and crafting messages involving victim language in evoking emotional resonance within female audiences, fostering a profound engagement with the environmental cause.

Moreover, the data analysis uncovers notable and influential effects of narrative interventions across different age demographics, emphasizing the importance of considering age as a critical factor in shaping effective communication campaigns for promoting environmentally friendly behavior. To achieve the intended pro-environmental outcomes and foster sustainable behavior, findings suggest that is essential to prioritize and implement tailored communication strategies that take into account the unique preferences and diverse perspectives within distinct age demographics.

Keywords: Narrative Persuasion, Storytelling Techniques, Pro-Environmental Awareness, Risk Perception, Sustainable Behavior

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Chapter 1: Introduction

In light of the urgent necessity to address various environmental hazards, the study of sustainability behavior has emerged as a paramount area of investigation in recent years. As a result, numerous sustainability initiatives have emerged, aiming to address issues such as climate change, flooding, resource depletion, deforestation, etc. However, despite the availability of these initiatives and the strategic planning behind them, their success and effectiveness heavily depends on the engagement and participation of the society as a whole (Dietz, Shwom, & Whitley, 2020)

Sustainable development and environmental preservation require an anthropocentric approach that can stimulate collective action, where individuals, communities, organizations, and governments all play a vital role. It is the proactive involvement and commitment of the society at large that drive the adoption of sustainable practices and the support for policy changes towards desired pro-environmental outcomes. Remarkably, a significant number of these challenges and hazards stems from human behavior, with the resolution of many of them also lying within the realm human behavior itself, presenting opportunities for addressing them by altering pertinent behaviors to alleviate their environmental reverberation (Steg & Vlek, 2009).

Considering the intricate nature of human behavior and its dynamics, narrative persuasion has emerged as a notable strategy in the fields of communication and psychology to effectively foster pro-environmental behavior. Narratives refer to the use of various storytelling elements, such as character, plot, and conflict, to convey information to the target audience as well as engage audiences emotionally. Narrative persuasion, on the other hand, involves using narratives to influence attitudes, beliefs, and behaviors. Previous research has demonstrated that narratives have the potential to enhance message processing, increase engagement, and most importantly, promote behavior change in various domains, including health, social issues, and politics (Shaffer, Focella, Hathaway, Scherer, & Zikmund-Fisher, 2018) & (Gardner & Leshner, 2015) & (Bullock, C.Shulman, & Huskey, Narratives are Persuasive Because They are Easier to Understand: Examining Processing Fluence as A Mechanism of Narrative Persuasion, 2021).

Narratives presented in the form of stories not only captivate individuals but also facilitate experiential processing, spurring cognitive and emotional engagement that occurs when individuals actively immerse themselves in a narrative or personal experience (Morris, et al., 2019). The process of experiential processing allows individuals to emotionally connect with the characters, situations, and messages conveyed in narratives, leading to a deeper understanding and internalization of the pro-environmental themes (Dahlstrom, 2014). By framing these

environmental hazards with engaging and relatable narratives, individuals are more likely to internalize the importance of sustainability, and be motivated to adopt pro-environmental behaviors. In addition, narratives can create a sense of relevance and urgency, by initially appealing to individual's emotions, values, and personal experiences, and subsequently increasing the likelihood of sustained pro-environmental action.

The process of promoting pro-environmental initiatives and actions begins with raising awareness, progressing to knowledge assessment, and ultimately motivating and convincing individuals to actively embrace a more sustainable lifestyle approach. Research has found that this process is furtherly enhanced by integrating narratives that utilize the power of persuasion (Bullock, C.Shulman, & Huskey, Narratives are Persuasive Because They are Easier to Understand: Examining Processing Fluence as A Mechanism of Narrative Persuasion, 2021) & (Oschartz & Marker, 2020). Narratives can provide vivid examples, relatable characters, and impactful scenarios that make sustainable behaviors more tangible and relatable, furtherly taping into the human inclination to connect with compelling narratives and engage with the underlying message.

This notion is rooted in the understanding that narratives possesses distinct and valuable advantages compared to non-narrative formats, indicating that they are more easily processed by people in general, thus facilitating persuasion and having a greater potential for influencing behaviors (Lee & Shin, 2021). This concept serves as the cornerstone of my research objective, which aims to delve deeper into the notion and gain a more comprehensive understanding of the influence of narrative persuasion, particularly in relation to sustainable behavior and pro-environmental actions.

This thesis is centered around narrative persuasion impact on sustainable behavior, aiming to investigate the role of narrative messaging and storytelling techniques in fostering awareness for sustainability initiatives and their subsequent impact on pro-environmental outcomes. By getting a comprehensive understanding of how narratives can effectively engage and influence the society as a whole, this research seeks to contribute to the development of communication approaches that can drive positive environmental action on a broader scale.

The thesis will follow a structured flow, encompassing several key chapters and sections, with the main idea being centered around the role of narratives in sustainable behavior development and pro-environmental outcomes. Firstly, a concise literature review will provide an overview of existing scholarly works on narratives, focusing on their constituent elements and characteristics. Secondly, an examination of the tools and techniques employed to harness the persuasive potential

of narratives will be conducted. This section will explore various methodologies and approaches employed to enhance the effectives of narratives in influencing attitudes and behaviors.

Thirdly, a comprehensive analysis will be conducted to explore the correlation between narratives and the development of sustainable behaviors. This chapter will delve into multifaceted ways in which narratives can contribute to fostering pro-environmental actions, and will investigate the underlying mechanisms through which narratives influence cognition, emotions, and social norms related to pro-environmental actions. Lastly, to strengthen the theoretical framework and validate the hypothesized relationships, an empirical analysis will be conducted utilizing a robust dataset derived from a study by (Raile, et al., Narrative Risk Communication as a Lingua Franca for Environmental Hazard Preparation, 2021).

This analysis will involve statistical techniques to examine the association between exposure to narrative messaging and pro-environmental outcomes, most specifically regarding the variation between gender-specific and age groups. By quantitatively analyzing the survey data, the findings from this analysis will not only enhance our understanding of the role of narratives in fostering sustainable behavior, but also provide empirical evidence and practical implications for designing effective and adequate communication strategies and interventions aimed at promoting desired pro-environmental initiatives at individual and societal levels. Furthermore, the findings will yield valuable suggestion regarding the adequate messaging content and context when it comes to generating desired pro-environmental outcomes, as well as lay a solid foundation for future research endeavors in the burgeoning field of inquiry.

Chapter 2: Narrative Persuasion

2.1 Narrative Background

The study of narratives has been commonly perceived to be an emerging scope of inquiry, (Gerson, 2015) with its sway in social and applied sciences. Narratives have the potency and ability to tap into both rational and emotional aspects of human decision-making, making them a potent tool for influencing customer behavior. We use narratives as a way of apprehending the events and stories that circulate around the world, in a macro and micro level, and as a medium to properly express our feelings and consciousness. Narratives are part of everyone's daily approach to communication archetype, whether it is in a professional setting, when you are elaborating in a principle agent type of association, or in a day-to-day informal approach, when you are sharing information with your friends and family members. Narratives add a peculiar nuance to the way the information is distributed from person to person as well as the substance of the information itself. The extent and magnitude of narratives is dispersed not only in the art and entertainment field, as studies suggest that it has been an efficient technique for influencing human behavior (Houghton, Siegel, & Goldsmith, 2013).

It is a distinctive human attribute to be immensely tuned towards narratives to vindicate ongoing actions, despite the level of truthfulness or untruthfulness they contain. (J.Shiller, 2017). The story that the narrative is composed can be simple, but the way it is expressed and portrayed to the receiver of the information drives the interest and the emotional connection. The content derived form a narrative can be very diverse and could change over time, yet the main goal shall remain the same, conveying a certain indisputable meaning while satisfying a specific social functioning (Ryan, 2007).

The inclusive influence of narratives expands in various fields and disciplines. In his latest influential book (J.Shiller, 2019) endowments the fascinating notion of narrative economics as an overlooked constituent in comprehending market trends and customer behavior. Shiller emphasizes that fabulous stories that contain broader narratives can easily spread from person to person, just like an epidemic. To get a clearer understanding of what are the components that mold narrative en masse, Robert Shiller offered a great perspective which can be observed as a starting point for further studies in regards to better grasp what narratives have to offer.

Shiller emphasizes the point that the level of contagion extent is in the heart of narratives, and is a fundamental metrics for measuring the impact and scope that a narrative can generate. He

elaborates that there exists two main element of contagion in narratives: one being the word-of-mouth spread of ideas, events in the shape of stories told across a variety of communication channel, and the second being entitled to the endeavor that people induce to generate newfangled contagious stories or to make stories as much contagious as possible (J.Shiller, 2019). Shiller also persists with the notion that stories shall not be restricted only to straightforward chronologies of human events. According to his point of view, a story can be as simple as a movie, book, song, joke, routine task, theory, journal article etc., as long as it can effortlessly convey into a conversation matter as well as having an emotional connection in its essence.

The latter is definitely shaped also by the influence of social media, as it is the area were narratives are generally created and shared with ease. Social media outlets are now undeniably the primary source of content vault, and the flawless recipe for success derives from great storytelling (Wertz, 2021). Social media actors, whether they are customers or vendors, are essentially storytellers that promote their brand values as well as customer personas by efficiently utilizing and leveraging storytelling as an essential instrument to gather engagement.

Brand storytelling is one of the key evaluators that deviates a good brand from a great brand, and the manner that narratives are connected with the customers is the path to brand loyalty. In simple terms, the smoothest way to drive stories, narratives are by promoting and conveying authenticity, utterly creating and distributing value to your end customers, delivering consistent and quality messages through your platforms, and last but not least, inspiring and motivating customers to engage and become a vital part of the digital community (DePino, 2022).

Narratives, and most specifically the storytelling aspect, possess a motive and purpose when they are dispensed to the audience, and they can be leveraged and exploited by the one provider of the narrative in accordance with the purpose it has. By definition, an essential component of a narrative storytelling is aptitude to bring facts to life through meaning making, in order to catch the attention of the listener and walk him though the mind of the storyteller.

By fabricating stories, consumers are presented with an experience, immensely catching their attention span by obtaining perspective and leading them to making crucial evaluations about the interaction pattern with product, brands, other customers etc. In order to properly build stories as a network of interactions, there shall be some factors considered that greatly shape the context and content of certain stories. Some of these factors such as timeline, purpose, target audience, personal experience, social norms, media etc., visible in Figure 1, shape the activities and artifacts of a story as well as the outcomes derived from them (Martin, Heylighten, & Cavallin, 2005).

Figure 1. *Building Stories*
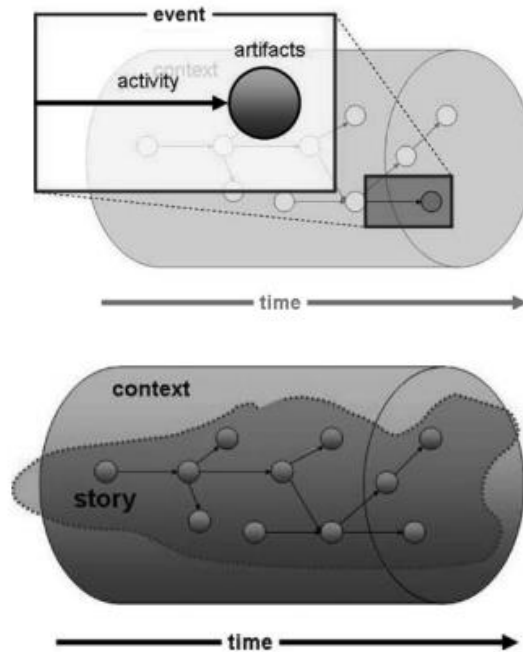
Source : (Martin, Heylighten, & Cavallin, 2005)

The application of narratives spans a wide range of fields of inquiry, reflecting its versatility and relevance in diverse context. By harnessing the inherent power of narratives, researches and scholars in diverse disciplines have found innovative ways to analyze and engage with their subject matter (R.Davies, Halpern, Horst, Kirby, & Lewenstein, 2019). In fields such as psychology and sociology, narratives offer a rich source of qualitative data that can help practitioners gain deep insights into human behavior, emotion, and social interaction. Narratives offer an impeccable approach that can smoothly uncover the intricate nuances of individuals experiences as well as contribute to a more holistic understanding of human complexities.

In the realm of healthcare, narratives have emerged as a powerful tool with the potential to elevate patient care and revolutionize medical education, thus deepening our comprehension of the lived experiences of illness and how certain patient behave in those conditions (McElhinney & Kennedy, 2022). The integration of narrative approach into medical education profoundly affects the relationship between patients and medical staff, as this approach cultivates empathy and nurtures a profound understanding of the complexities inherent in human health and disease.

Moreover, narratives play a vital role in communication, offering a compelling and effective way to engage audiences and convey message (Dahlstrom, 2014). Inspiring and shaping attitudes and

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beliefs through narrative persuasion is an essential tool in effective communication strategies across various contexts, finding its highest utilization in the realm of risk communication. Communication strategy and narrative persuasion relationship is visible also in business and marketing endeavors, most particularly in the context of resonating establishing an emotional connection with target audience, thus influencing customer perception and shaping purchasing behavior.

In summary, narratives are an integral part of human communication and can serve a multitude of purposes, from entertaining and informing, to influencing and inspiring. By engaging with narratives, we are exposed to new ideas and perspectives that can challenge our assumptions and broaden our understanding of the world, also helping to make sense of our own experiences and emotions. Once we comprehend the influence and potency of narratives in shaping our beliefs and behaviors, we become mindful of the stories we consume and share. This awareness enables us to use narratives as a force for good, inspiring positive change and motivating others towards constructive action. However, it is important to acknowledge that narratives can perpetuate stereotypes, promote harmful behaviors, and spread misinformation. Therefore, it is essential to critically evaluate and be vigilant to the narratives we encounter.

2.2 Interactive Narrative

Interaction and engagement have thoroughly been recognized as crucial elements in narrative persuasion and communication strategies. In the recent time, there has been a growing understanding of the importance of the active involvement and meaningful participation of individuals in the communication processes, aiming to create immersive experiences that resonate with audiences on a deeper level. This active participation is thoroughly associated with the use of storytelling techniques, as a powerful tool that furtherly enhances the potential for message comprehension, knowledge retention, risk perception, all significant elements that provide a path work for a desired attitude change.

By using interactive elements through storytelling approach, interactive narratives can guide individuals by providing a more complete understanding of the available options and potential outcomes. The incorporation of elements such as branching storylines, character dynamics, interactive decision points etc., individuals can not only be involved in the narrative but they can also explore different perspectives and consequences based on their choices. This approximate has

a wide range of framework, such as education, marketing, innovation, sustainability etc. (M.Jenkins, 2014)

According to (Singhal & Rogers, 1999), crafting messaging that both entertains and educates the target audience does have an evident impact on change of attitudes and behaviors, ultimately promoting positive change. They present the notion of "entertainment education" as a powerful strategy for shaping attitudes and behaviors on a diverse range of social and health issues, from improving literacy to encouraging sustainable lifestyle and up to cancer prevention. The engaging and immersive nature of entertainment-education can help individuals better comprehend complex topics and retain valuable information, eventually leading to a more informed decision making, that can positively influence individual perceptions and actions. Entertainment-education aims to participate in the conducted social change behavior, which refers to altering the structure and functioning of a social system, at the individual as well as community or system level (Singhal & Rogers, 1999). There prevail two sorts of social change that are derived from the extensive sway of entertainment-education theory.

Firstly, it can influence audience stance and awareness towards a socially desirable outcome, as demonstrated by the radio soap opera "Twende Na Wakati" in Tanzania, which convinced thousands of individuals who were deemed as sexually active adults to foster awareness and adoption of reproductive health behavior, most specifically HIV/AIDS preclusion The engaging content provided by the show through display of a variety of stories and narratives not only increased awareness but also furtherly motivated the audience to take proactive measurements, such as use precautions alternatives, such as contraceptive sheaths and/or lowering the number of sexual partners.

Secondly it can influence the external environment of the audience, generating the essential conditions for social transformation, either at group or system level. It can occupy the role of a social advocate that shapes public and policy initiatives in a socially desirable instruction, guiding the audience toward positive behavior that provides preferred results. Some examples of this social change approach can be observed in the recent implemented tobacco control policies by a various governing bodies, environmental protection initiatives such as wildlife conservation or regulations on industrial pollution, advocacy for renewable energy policies etc. (Theophilus & Jack, 2017).

This correlation between influencing attitudes and behaviors through engaging and interactive narratives holds promise for achieving positive environmental outcomes and fostering a more sustainable future. Just as the show encouraged individuals to take proactive measurements toward a serious health hazard, sustainability-focused initiatives have the opportunity to firstly raise their

awareness through in-depth education of the subject in matter, and subsequently inspire people to adopt eco-friendly habits and make more sustainable choices in their daily life.

Another conceptual framework of research in the field of narrative economics was established by (Hamby, Daniloski, & Brinberg, 2015), showing evidence of the impact derived from story-based and information-based consumer reviews on attitudes towards a certain product and service. The study furtherly examines in the bigger picture the role of transportation, reflection, behavioral intent as core parts of the persuasion dynamics and scope derived from narrative engagement. The act of transportation presents readers with the chance to indirectly live through the provider of the narrative point of view (Slater & Rouner, 2002). Reflection is utilized an intermediary between behavioral intent and transportation, a link between the real world and narrative world, with the latter being greatly shaped by the context and content of narratives. The more a content is perceived credible, persuasive, knowledgeable, the higher is the likelihood to positively integrate behavioral intent hallmarks, such as attitude and behavior.

Figure 2. Narrative Persuasion Model

Source: (Hamby, Daniloski, & Brinberg, 2015)

This process, as illustrated in Figure 2, enhances the relevance and personal meaning of the message, furtherly strengthening the potential for behavioral change. For instance, the narratives perceived sensibility and personal risk are relevant components, most particularly in the health-related context. (Dunlop, Wakefield, & Kashima, 2008). Once an individual is transported into a health-related narrative, in this example a skin cancer narrative, the process of reflection involves assessing and interpreting the relevance of the content to their actual life. These individuals tend to experience higher levels of self-awareness, risk perception, and favorable attitudes towards skin protection. Consequently, individuals gain a deeper understanding of the issue at hand, enabling them to take appropriate actions through utilization of narrative transportation and personification.

This research offers essential insight and proof of how interactive and engagement narratives content does have a vital role, not only in the seeking and transportation of adequate information, but most importantly in their sway on persuasion-related outcomes. It is an arduous task and

responsibility to engage and influence behavioral intention, but persuasion does offer a recipe for success when it comes to promoting positive messaging and reflecting on a certain matter at hand. The task becomes greater when the matter on hand is not only in an individual extent, as the skin cancer prevention example provided, but when it involves and affects a large community, such as sustainability concerns with regards to the current and future generations. Addressing such complex challenges requires collective action, widespread awareness, and most importantly, a commitment to pro-environmental behavior for the betterment of the society as a whole.

2.3 Conviction Narrative

With the study of narratives reaching new heights and dimensions as it belongs to the human behavior pattern, there does exists a disparity between the classical or traditional model of decision making as well as what the new models of decision making. This disparity exceeds the emotional and rational approach to it, even though it is still one of the building blocks and principles, which has clearly opened the horizon for researches to furtherly comprehend which approach is most adequate and efficient for certain situations. The foundations of the proclaimed traditional approach fit the description of making optimal decisions under ideal circumstances, due to possessing unrestricted access to information and knowledge assessment, subordinate level of uncertainty, identification of a clear problem etc. (Bugajenko, 2017).It is derived in the premises of rational thinking, which does not paint the whole picture, and does limit the analyses of the framework of decision making theory.

Definitely this approach is suitable and efficient for a diverse research purposes, but in my research the focus in not specifically in the traditional approach of decision making, as the experiment that will be investigated lays in the premises of a blend between emotional and rational appeals, and how diversely are they pursued by specific narrative. Within the realm of storytelling, narratives often combine emotional and rational appeals by means of characters personifying, showcasing the unique purpose and diverse approaches taken by specific narratives. This interplay, even though is not heavily recognized and utilized in the traditional approach, has a paramount significance in current times, as the next sections will delve in-depth about the role it plays in outcome development, particularly in pro-environmental outcomes

Recent research has called into question and has challenged an integral aspect of the traditional decision-making approach, namely the level of uncertainty involved. Theory developed by (Tuckett & Nikolic, 2017) establishes the notion of conviction narrative theory, as an alternative

perspective that emphasizes the contextual influence on actions, particularly in situations characterized by highly uncertain outcomes. This theory implies the importance to acknowledge the fundamental role uncertainty plays in shaping human behavior, highlighting the need to consider and navigate uncertainty as a pillar when it comes to understanding certain human actions.

This notion permits consumers to lure on their beliefs and personal values, as their primarily driver and stimulator of future outcome of their actions, making them feel confident and sufficiently convinced to engage in an action or decision. It can be described as a type of storytelling that aims to persuade and induce a listener for a particular point of view or belief. Key elements of conviction narrative are a clear and well defined message, supported by a compelling story that supports the message, and emotional appeal that helps to engage the audience. The involvement of stories as an easy and efficient medium of communication as well as a fundamental manner of mental organization, does stimulate certain individuals to recognize opportunities worth carrying on, moreover justifying the latter actions adequate to their desire.

The groundbreaking research by (Tuckett & Nikolic, 2017) elaborates four essential path of action derived from conviction narratives that provide a helping hand for making decisions accordingly to their beliefs and personal values. These path of action are: a) attempting to derive significance from situations by associating implicit causal explanation with auxiliaries in identifying potential action opportunities, b) trying to simulate diverse potential future outcomes of the action to be taken while also prognosticating their subjective effects, c) communicating about the action to build and boost social endorsement for their decisions, d) articulating and upholding the preferred and desired path of action, enabling them to maintain their commitment no matter if the risk of loss is presented in the situation.

One of the central tenets of the conviction narrative theory is the role assigned to emotional and rational processes, a role that is critical for managing approach and avoidance disputes and emotions that ate derived from the nature of uncertainty. Even though the degree of deliberative thoughts and considerations is not supplanted, cognitive and metacognitive processes serve as the main pillars of conviction (Zeelenberg, Nelissen, Breugelmans, & Pieters, 2008), and narratives should be carefully designed in the context of those pillars, in order for actions to have effects and outcomes close to the desired frame of mind and principles. Narratives that in their essence have the sense making as the point of focus, while also attempting to predict action outcomes, expedite the establishment of a certain quality of subjective knowledge about the outcomes effects. These narratives maneuver at various levels of consciousness and emotional appeals, establishing a

perceived experience that leads to either positive or negative emotional encounter, while ultimately promoting vigorous acknowledgment and responds. s

The figures below present distinctly the process of path of action in both rational and emotional appeals, as well as their main contributors and elements that influence the desired outcomes. In contrast with Figure 3, where the simplified approach deems emotions as bias heuristics and hinder deliberative thoughts (Kahneman, 2011), Figure 4 delineates the circular interaction between cognitive and embodied emotional processes in a social context. Associating it to the notions and findings obtained by (Kahneman, 2011), most specifically with the perceived System 1 and System 2, in human thinking appeals in path of action, we can recognize similarities in the framework of the conviction narrative and emotional / rational processes. The two-system view posits that System 1 operates quickly and intuitively with a robust emotional component, while System 2 operates with a deliberative approach, in a more slow down and logical manner.

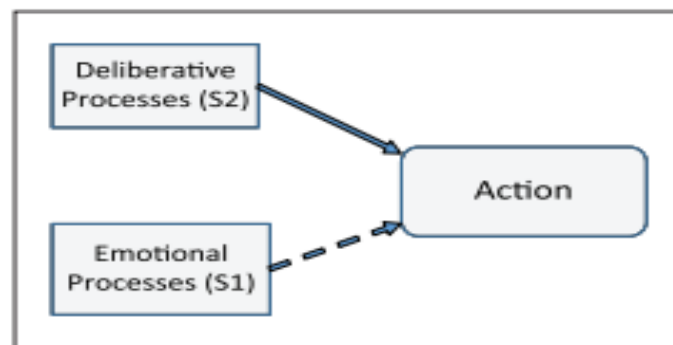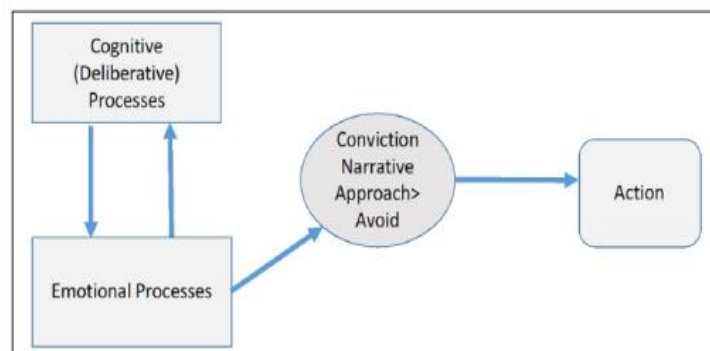*Figure 3. Simplified Rational Process*

Figure 4. Dynamic Cognitive and Emotional Process

Source: (Tuckett & Nikolic, 2017)

There does exists a level of disparity between the types of narratives, mainly caused by the preferences of certain individuals, as well as the motivations behind certain opportunities aroused. Nonetheless the degree of subjectivity and uncertainty of outcomes makes the conviction to act derived from narratives an arduous task and responsibility. The emotions accelerated by diverse factors, such as decision rules, credibility of information, action tools, explanatory models, attractiveness level etc., thoroughly contribute to the evaluation process. These factors provide insightful and essential guidance on how to respond to a certain situation in a feasible manner, since the response has the same weight of importance as the anteriorly structures and processes of the decision making theory.

Responses and outcomes can be predicted and anticipated based on the thumb rule habits as well as an utterly collected past record of those outcomes, but yet they are not sufficient to pain the whole picture. This all comes due to the radical uncertainty these rules of thumb operate, alongside change behavior and/or self-conviction, or any other internal and external influence closely related with the conviction regarding opting for a certain decision.

A prime example of a radically uncertain setting is sustainability. The complexity of sustainability issues arises from the intricate interactions between natural systems, human behavior, economic activities, and social dynamics. Unlike issues with well-defined parameters and predictable outcomes, sustainability issues involve numerous interdependencies and nonlinear relationships that contribute to their uncertain nature. Thus it is crucial to keep in mind the dynamics of uncertainty when it comes to addressing the complex challenges aroused from environmental risk, as well as explore the extent of individuals' awareness regarding negative impact of uncertainty and the necessary measures to mitigate its adverse effects.

2.4 Persuasion of Narrative and Non-Narrative Messaging

Persuasion is a fundamental aspect of human communication, and it involves the ability to influence yourself first and others to accept a particular point of view, belief, or behavior. It can be observed as a step further than interaction and conviction, and even though they might be related they are distinct concepts. They differ in their focus and purpose, as persuasion refers to the influence of beliefs and behaviors of others in a social approach rather than personal approach, aiming to persuade a shift in attitudes or behaviors. Persuasion can be a powerful tool for change, but it must be wielded with care, and it is essential to approach it with ethical considerations in mind, ensuring that it is used for foster genuine understanding and encourage people to make

informed decisions, despite the messaging content or context. Definitely, the process of persuasion that resonates and inspires change actions of ingrained attitudes or behaviors, can be a challenging endeavor, and entails several factors and various techniques. Two widely exerted techniques when it comes to achieving persuasive outcomes, are the argumentation and narrative approach, which implies a disparity between emotional and rational appeals in the social proof context of shaping messaging subject matter.

 In the context of persuasions, the use of narratives is often perceived as an alternative to argumentation (Bilandzic & Busselle, 2013). This dichotomy can be traced back to the ancient Greek philosophy, specifically to the works of Aristotle essential distinction between logos and pathos, as well as Plato's passion and reason notions in decision making evaluation. For a significant portion of the 20th century, persuasion was typically associated with argumentation, rooted in the notion that evidence based line of reasoning was more persuasive for the mass (Zarefsky, 1990).

As it was mentioned in the previous sections, argumentation theory is a main pillar of traditional decision making process, but even though it is not a perfect assessment of the process in totality, this paradigmatic approach has a proven record of efficiency when it comes to persuading individuals to change their mindset and support certain policies. Fundamental components of the argumentation theory, such as validity, credibility, soundness, defeasibility, deductive manner, relevance etc., have properly been utilized in policies and reforms in economy, society, environment (Eemeren & Grootendorst, 2004).

The inclusion of narratives in persuasive communication adds a layer of depth and richness to the message. Rather than simply presenting facts and figures, narratives allow communicators to convey complex ideas and emotions in a more engaging and relatable way. However, the use of narratives does not necessarily preclude the use of argumentation, and they are shall not be deemed as mutually exclusive. In fact, narratives can be used as a heuristic device to supplement and strengthen logical arguments. By weaving a narrative into the argument, communicators can make the message more memorable and emotionally resonant.

Likewise, argumentation can be incorporated into narratives to make them more persuasive and compelling. By using rhetorical devices and persuasive language, narrators can guide the target audience towards a particular conclusion or belief. This fluid approach to persuasion opens up new possibilities for creating impactful and effective communication strategies that not only enhances the persuasive impact of the message but also increases the likelihood of changing attitudes, beliefs, behaviors in a positive way.

It recognizes that some individuals are more persuaded by logical, fact-based arguments, while others are more responsive to emotionally compelling stories (Bullock, Shulman, & Huskey, Narratives are Persuasive Because They are Easier to Understand: Examining Processing Fluency as a Mechanism of Narrative Persuasion, 2021). Overall, the integration of argumentation and narrative also allows for a more creative and engaging approach to communication, encouraging audience participation and co-creation of meaning.

The debate over the persuasiveness of narrative versus non-narrative messages remains ongoing and inconsistent to put it simply. While some studies have found narrative messages to be more persuasive, other studies have found non-narrative messages, particularly those based on argumentation, to be more effective. For instance (Liu & Yang, 2020), delves through their study that narrative persuasion could be an effective strategy to discourage young adults from using e-cigarettes, revealing that when participants are presented with a narrative based messaging featuring the consequences of nicotine addiction, they perceive a higher degree of transportation, leading to a stronger perception of the health threat associated with e-cigarettes.

Another article by (Ricketts, Shanteau, McSpadden, & Fernandez-Medina, 2010) revealed that participants who were provided with instructions containing concise stories related to playground injuries demonstrated greater adherence to safety guidelines in comparison to participants who were given instructions without any such stories, with safety behavior improving by approximately 19% when narrative messaging was received as compared to non-narrative messaging. Importantly, the use of narratives did not lead to excessive fear and unwarranted concern. Lastly, (Habets, 2020) indicated that interactive narratives were more effective than traditional non-narratives in vanquishing resistance to persuasion attempts in health communication among individuals with a high need for cognition.

Conversely, some evidence exists that challenges the idea that narrative messaging is the most effective way to compile and communicate messages. Instead, traditional non-narrative approaches, such as argumentation and rhetorical language, prior attitudes and behavior, experience and knowledge etc., have been shown to attract the interest of communication persuasion across various disciplines. Study findings by (Oschatz, Niederdeppe, & Liu, 2021) do not support the assertion that narratives are more effective than non-narrative messaging, instead, they identified prior attitudes as a crucial and unique factor in shaping recipients identification and transportation, ultimately influencing their behavior towards the message.

The impact of message type, narrative versus non-narrative, on transportation and identification was not as strong as the effects of message consistency, and there is a decreased likelihood of

persuasiveness when the message content was inconsistent with one's prior attitudes and set of values. This study assesses that the inclusion of narratives in the message communication does not change the outcomes nor the attitudes of the recipients of the messaging, but prior attitudes that can be based on personal set of values, knowledge, preferences etc., were a robust predictor of persuasive outcomes.

The experimental research about the impact of stories in advertisement by (Appel, 2022) demonstrated that the utilization of narrative ads resulted in greater degree of affective resistance as compared to non-narrative ads for the same product. As a consequence, the study observed a more negative outlook towards the advertisement, lower scores in terms of word-of-mouth intentions, a resistance to share the advertisement online, yielding an indirect negative effect on advertisement attitudes and intentions. The presence of affective resistance as well as the negative effects of perception and comprehension of the story based advertisement was affiliated with the narrative being perceived as inauthentic and stale, thus not reaching the desired persuasive impact.

In conclusion, the debate over narrative vs non-narrative messaging as the more persuasive approach remains inconclusive. As such, both approaches have their unique strength and weaknesses, and it is essential for messaging practitioners to carefully consider the context and audience when choosing the most effective approach. Additionally, despite the perceived dichotomy between argumentation and narrative appeals in messaging compilation, there is evidence to suggests that combining both approaches can yield persuasive outcomes. While narratives may offer higher levels of engagement and persuasiveness, it is worth noting that their effectiveness is contingent upon various factors, and merely incorporating a narrative alone does not guarantee a successful persuasive outcome.

Chapter 3: Persuasive Framework

3.1 Word of Mouth Contagion

Information-seeking and sharing behaviors about consumption experiences is a crucial factor in the decision making process that greatly influence consumer choices (M.Herr, R.Kardes, & Kim, 1991). In the whirlpool of decision making, a main contributor is once again storytelling and the spread of narrative through word of mouth. The derivation of these phenomena leads to the prevail of the contagion approach, another dimension of storytelling that eradicates the strictly rational options by centralizing the decision making process. Stories behave as an efficacious communication tool that permits a thoroughly spread of ideas across individuals as well as assisting them in overcoming emotional barriers (Project Zero, 2019).

It is particularly the awareness component that is derived from the rapidly distribution of information in the form of stories, where each individual can comfortably influence and get influenced. The word of mouth contagion is a common and powerful tool to connect with individual in the form of social transmission, and definitely it is an undeniable factor in our day to day life. In this social epidemics, stories catch on and authentically encourage and persuade individuals to catch on the same idea or notion as well. It is not by coincidence rather than by default, that certain ideas catch on and halt the curiosity of the general public, especially when it comes to purchase of goods and services, and it derives from a small number of individuals up until a greater population size (Berger, 2013).

Berger examines six principles that make stories, ideas, news, information more likely to spread throughout the social diffusion, with the contagion properly establishing a recipe for success in regards to product popularity. These six attributes are: social currency, triggers, emotion, public, practical value and stories. Social currency refers to the level of attractiveness certain product or idea establishes, triggers involves a stimuli approach that prompt customers to think more extensively for a product, emotion regards to the feelings evoked from the sharing of information, public voices the emulation aspect of the general public as well as behavioral residue encouragement, practical value refers to the establishment of useful content that promote efficiency and usefulness, and last but definitely not least, stories role as vessels that contain appealing information, which captures the awareness of individuals with ease and efficacy.

The awareness makes the product known, but the positive feedback boosts the popularity of the certain product, and word of mouth definitely shapes the extent to which these products are

perceived in customer's mind. This explains why five star hotels are preferred more than three star hotels, or a product who has one hundred positive feedbacks on Amazon is often more preferred than the same product who has ten positive feedbacks, or when you go watch the movie that your group of friends suggested, our choices definitely are affected by the transmitting of information from one person to another, one community to another, one medium to another etc.

The so acclaimed offline word of mouth, consisting of sharing of information between a group of individuals in an oral or written form, face to face or indirect mode, is perceived to be a very efficient influencer of assisting purchasing decisions, as indicated by the survey presented in Figure 5 (Guttmann, 2017). With the adjunction of online word of mouth, the influence becomes greater, as the contagion derived from social media platforms become so vivid in customer's mind, and affects from the most regular up to more complicated purchases. Positive word of mouth is like a social epidemic, it starts from unilateral advices and conversations between a small number of individuals, more often between friends and acquaintances, and exploits into a phenomenon which involves various communities. This phenomenon establishes in a psychological state that establishes affirmative stance, due to the trust and confidence constituents that persuades the customers way more than commercial techniques like advertisements or promotions (Shiekhodaie, 2016). Positive word of mouth additionally establishes the conceptual context of brand affection, brand commitment as well as value congruity, all essential elements for customer perception and behavior.

Figure 5. Impact of Word of Mouth on purchase decisions in USA in 2017
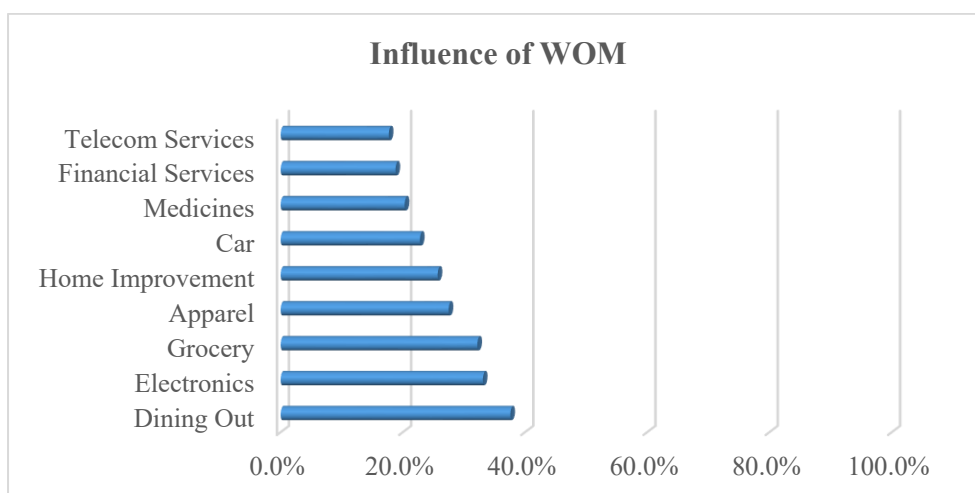
Source: (Guttmann, 2017)

In addition to its successful utilization in marketing and customer behavior, word of mouth can be particularly harnessed as a framework in narrative persuasion for promoting sustainability behavior. While this contagion approach has long been recognized for its impact on consumer decisions and product popularity, its potential in driving sustainable practices its gaining more prominence and is deemed to be equally significant. Extensive research in this field of inquiry by (Mouloudj & Bouarar, 2021) revealed compelling evidence that word of mouth communication plays a pivotal role in shaping environmental awareness and influencing attitudes towards green products, consequently leading to a significant positive impact on the intention to purchase such products. The findings presented offer a valuable framework for guiding future efforts and strongly advocating for fostering positive word of mouth communications surrounding diverse sustainability issues.

Another research by (Singh, Gupta, & Kapur, 2022) found that the utilization of word of mouth communication has been identified as a crucial mediator between green skepticism and shifts in individuals green behavior. The study found that greenwashing possesses a challenge that might undermine consumer pro-environmental choices. This highlights the importance of fostering authentic and trustworthy messaging as a counteract to skepticism and inspire pro-environmental outcomes, leveraging the power of word of mouth contagion to work towards a more sustainable future and combat greenwashing practices effectively, achieving dual objectives.

In conclusion, the power of word of mouth communication in shaping consumer behavior and driving sustainable practices cannot be underestimated. From its role in influencing consumer choices and product popularity to its impact on environmental awareness and attitudes toward pro-environmental outcomes, word of mouth has proven to be an efficient communication tool for promoting sustainable behavior. The potency and influence of this communication approach lies in its contagion and easy of processing, both essential factors that contribute in raising awareness for environmental hazards, suggesting leveraging this approach in future environmental communications campaigns.

3.2 Opinion Dynamics

Recent studies in the context of information transition and knowledge assessment have established the prominence of subjectivity as an integral component of changing individual viewpoint in the prevailing social exchange of information (Peralta, Kertész, & Iñiguez, 2022). In the heart of the subjectivity embodiment lays the foundation of opinion establishment, yet another element so

essential in the human psychology and neuroscience. The range and scope of the opinions is vast; we are all encompassed by them in our day to day life. In a conscious approach, we are deemed to give opinions for certain actions and ideas, whether it is in a casual conversation or in a professional setting. You want to get an opinion of your best friend when it comes to which dress you will pick up for you wedding, as well as you are also required an opinion about the effects of the petrol prices crises if you are the president of the country. More often than not we utilize opinions as an engagement compel, with the purpose of comprehending diverse viewpoints of the social behavior dynamics, as well as the key drivers of influence of actions and interactions.

Opinions, just like emotion and word of mouth, are perceived to be key elements in the institution of customer belief and perception. Opinions are widely influenced by narratives and stories, and vice versa, narratives approach influences the formation of opinions for certain occurring, one of them the decision making dilemma. It is widely known the presence of various corresponding influence processes that shape the general opinion establishment, with some of them comprising group influence, stereotypes, informational influence and so forth (Das, Gollapudi, & Munagala, 2014). This social phenomena evolution in years and disciplines required the emergence of a new notion, opinion dynamics, derived from retributive research by academics and researches and sparked by the unique dimension of the human psychology (Xia & Xuan, 2011).

There prevails a tendency that individual behavior does correlate and correspond with the majority of the group behavior, which is generally known as herd behavior. In simple terms, herd behavior mentality asserts that individuals repress their personal thoughts, opinions, actions on a par with the majorities same attributes. This mentality weights the pressure and conscious choice off the individual responsibility and elects to follow the same path of logic and rationality as the majority of the group elects to. In a variety of social experiments with the main focal point of "group pressure" by Solomon Asch in the 1950s', there was clear evidence and example of the herd mentality application.

The experiment tests reported that nearly 75 % of the sampled individuals were at least once in conformity with the rest of the group choices, even though the group choice might have been the incorrect one. The influence of the majority of the group choices to the individual's choice was far significant, making the experiment test a building block for understanding the impact on decision making by group influence (E.Asch, 1956). The outcomes bring ignite to the emotional decision making exceeding rational decision making, as individuals tend to permit the anxiety and pressure of a decision to influence their brainstorming, and as a matter of course they alternate to a comfort

state of mind, and for lack of better words, they follow the crowd and not trust either their gut instinct or their knowledge.

This mentality is remarkably observed also in the current times, nowadays moreover influence by the presence of the social media platforms. Level of comfort and trust to the group influence and their choices tends to steadily increase and be a dominant factor when the group is governed by individuals of high status and power as well as popularity and reputation. By definition, opinion dynamics incorporates and amends opinions in due course obtained by interactions and amends between agents involved. Individual opinions and interactions between agents is once again an evidence of cause and effect approach, as the initial is observed as an output rather than an input variable, meanwhile the latter is severely influencing the outcomes (D'Errico, 2013).

There are certainly various factors that needs to be considered in this relationship between agents and opinion formation, and they are also associated with level of comfort and trust. Information asymmetry, status quo, popularity, bounded confidence, preceding outcomes etc., have direct impact on individual opinion formation patterns and appraisal in a social setting approximate. Undoubtedly, there are also subconscious basis, as attitude and emotion does also constitute in opinion dynamics and more specifically in the theory of following the crowd in decision making.

An adequate representation of this rationality is the wisdom of the crowd theory, which presupposes that large group of individuals, described as the crowd, are believed to have proper and advantageous knowledge obtained by the collective brainstorming of ideas and opinions, thus leading to ameliorate decision making. Crowdsourcing in this case is deemed as a more efficient way to generate value through the choices assortments than the individual thought processes. Consequentially, the burden of opinions obtained by the large crowd is deemed to be heftier than that of one individual person. In conclusion, on the basis of the group pressure by E. Asch and the wisdom of the crowd theory, we can observe one major keyword, delineated as the trend of taking for granted the opinions of the large crowds and following their path of not only critical thinking, but most importantly in the process of decision making, which more often than not is in the same parameters as the majority. Examples of this theory can be founded all over the place, with the most obvious one being the majority voter's beliefs, notions, preferences, during the election period.

3.3 Public Narrative & Narratives for Change

There has been extensive work on delineating the dynamism of narrative approach in the public perspective, as undoubtedly they are the main vector of development as well as the foremost beneficiary. The foundation disquisition that brought so much awareness and attention on value derived from the comprehension of the public narrative widespread erudition, are the extensive research articles published by Marshall Ganz throughout the years. Ganz depicts public narrative as a leadership convention and praxis, which utilizes personal values to attain shared purpose exertion, in order to galvanize organized collective action of change (Ganz, 2011). It is the art of metamorphosing values into action through command of storytelling. Using this rationality, Ganz asserts that organized collective action does not occur spontaneously nor naturally, this social movement is greatly confided on mutual commitment, discretionary participation and constant motivation.

Change is a psychological state that is particularly arduous and it requires way more than just sporadic outburst and mobilization, especially when it is imperative in a broad social setting. Shifting of mentality, way of actions, bureaucracies, critical thinking, emotional intelligence, public perception, public behavior etc., are all leadership prodigies, and are well defined and influence by competent leadership abilities or lack thereof (Andersen, 2022). There are always two side of the medal, as well as there are always present efficient and inefficient leadership practices and praxis, and history has presented us with some valuable examples of them, when it comes to the change phenomenon.

It was a nuisance to transform predominantly rural communities into urban communities, shifting from hand production to machine production in the factories, it was a long process with a lot of obstacles, but efficient leadership did facilitate and smooth this process, most particularly with the establishment of unions and government policies and reforms (such as child labor laws, eight-hour working days, providing of land, construction of railroads etc.). Same approach can be effortlessly observed in the digital transformation of the majority of our day to day activities, with the establishment of the internet of things as the main pioneer of the so acclaimed fourth industrial revolution, described as Industry 4.0 (Tulasi, Sigit, Pradana, & Ellitan, 2019).

The fear of change and its associated pressures are often overlooked factors in the decision making process. Conservation is closely associated with high levels of conformity, tradition, security, and lack of hedonism and self-enhancement (Schwartz, 2012). Change is a phenomenon that shall be first initiated and conducted by ourselves, then encouraged and motivated by others affectionately, and that is what Ganz intends to present. Actions that are deliberately connected with change are

abundant in uncertainty, motivation, emotion, hope, and hazard, and does require not only self-appraisal but also mobilization and participation of others in the social community.

Figure 6. Mobilization of Others.

Source: Zac Willete and the author (Ganz, 2009)

He identifies three approximates that contribute in a prosperous pursue for collaborative social action, as demonstrated in Figure 6 & Figure 7 (Ganz, 2009). Ganz attempted to elucidate the remarkable correlation between these three dimensions of stories across the social community, a mix of values and actions that commands emphasis. The story of self relates to the act of inspiration toward a move to lead others into following the same desirable path of thinking, by constructing stories that communicate valuable experiences and choices made by you.

Figure 7. Public Narrative Vectors

Source: Zac Willette and the author (Ganz, 2009)

The logos, pathos and ethos of personal stories allows each individual to communicate his actions, choices, experiences in a heedful approach rather than an abstract approach, thus enhancing empathy and attachment. Story of now is associated with the action path, an overlap between the "why" and "how", providing the essential guidance from start to finish with the only purpose of achieving desirable outcomes. It is deeply connected with the strategy and vision as well the risk and challenges of the values that are intended to be shared. There is risk and reward for each path of action, and that correlation is very important in order to determine the most meaningful choice. And last, story of us relates to the community stories, by articulating core values in order to identify and distinguish the community.

In conclusion, the power of narrative persuasion cannot be overstated when it comes to influencing human behavior. As demonstrated by Marshall Ganz's research, public narrative is a leadership convention and praxis that utilizes personal values to attain shared purpose exertion, in order to galvanize organized collective action of change. This requires competent leadership abilities that can facilitate and smooth the process of change, as seen in historical examples such as the establishment of unions and government policies during the industrial revolution. By constructing stories that communicate valuable experiences and choices made by individuals, providing essential guidance from start to finish, and articulating core values to identify and distinguish the community, persuasive narratives can inspire change, thus fostering sustainable behavior and spurring pro-environmental outcomes.

3.4 Neuroscience of Storytelling

Human brain is the most extraordinary organ in our human bodies, and for decades' scientist have been studying, researching, experimenting, in order to comprehend the complex dynamics, the human brain offers. It is the organ that generates our thoughts, establishes our memory system, produces impeccable feelings while we are experiencing certain actions, and most importantly it shapes the personality and the way we tend to behave. Our brains are unique also in the fact that they are deliberately distinguished from one another and they react differently to information and data. The neural mechanism of each individual processes social behavior and cognition in a distinguished manner, and is strictly related to emotion and cognition, which are generally perceived as the two main pillars of the mental processes that shape the psychological marvel (Wang, et al., 2018).

In connection to our rationality in regards to the magic dimension of storytelling, there does prevail a neurobiological aspect of storytelling that is relevant to better processing and comprehension of information. It is not a surprise that our human brain is enticed and amused by stories, but what

comes in handy is the comprehension of why is the human brain so deeply associated with this phenomenon. The primary reason why human brain is so amused by stories is due to the fact that it is in our genetics as social creatures to associate with strangers, and storytelling is the most effective method to transmit knowledge and value, from individual to individual, from society to society, from individual to society and vice versa (Zak, 2013) .

Stories are an effective and efficient way to learn something new, and our human brain mechanism is urged to rubberneck out of gloomy curiosity. The interesting analysis of the experiment test case called "Ben Story" emerged with important insight for furtherly expanding the repercussion of brain stimulus to storytelling. The compelling story is as continues:

"Ben's story is a compelling story about a young child who is diagnosed with brain cancer and his father. Ben is perceived to be happy and delighted playing with his dad after he just completed his chemotherapy session, and is completely unaware of the critical circumstances of his condition. On the other hand, Ben's father is struggling to play with Ben because he understands that Ben is on an arduous mission to survival, and his emotional state of mind is in the worst possible condition."

This predictive model determines two main emotions derived from this experiment, empathy, and distress. Distress was derived from the production of the cortisol chemical, which is correlated with attention focus. On the other hand, the second chemical released was oxytocin, a representation of empathy due to the association with empathy and connection. In simple terms, there is observed a clear change in behavior and perception caused by an alteration of the chemicals released by the brain. Individuals who had a higher level of oxytocin and cortisol release were more likely to donate money to children's charity, an action generated by the brain due to the level of connection with the character's dramatic story. The more level of oxytocin you release, the most likely you are going to be in compassion with the storyteller, and that sense of empathy and understanding is widely a factor that justifies the expedition of further actions.

The thought process of making this decision is heavily influenced and motivated by the engagement of individuals in cooperative behaviors. This rationality can be observed in an organizational setting, as individuals tend to be more motivated by their organization's preeminent purpose and core competencies rather than the purely transactional purpose of selling goods and services, with the preeminent purpose being effectively communicated and shaped through stories (Zak, 2014). When you pay attention to a story, your entire brain is activated and begins to enliven and light up. As you are processing information derived from the narrative of the story, your human brain is swaying senses and emotions to engage through the arousal of the four lobes of the brain,

the parietal, temporal, frontal, and occipital (Eber, 2021). It is a sophisticated yet very dainty relationship between data and emotions, which derives primarily from the duality parentage of science and art, emotion and logic, intuition and reasoning.

Personal stories provide an element of persuasion through their narration of real life of personal experiences and occurrences, and their approach and extent is not deemed only in a simply individual level, as their purpose and functionality is associated with social action and self-construction (Maynes, Pierce, & Laslett, 2008). Even though stories might vary in their content and context due to the variance of individual personalities, it would be ingenuous to identify them as strictly idiosyncratic, due to the fact that they provide unique insight and are utterly embedded in social relationship and structures. Furthermore, personal stories act as a bridge between individuals and society, with the purpose of disseminating the thin line between individuals and society in a social-scientific inquiry. As in the Ben story, the interaction between the individual, the one who narrates the story, and the society, individuals exposed to the story, goes way beyond the emotional reaction to such a devastated personal story. It initiates an action and inspires a cooperative behavior, while connecting individuals from different cultural, social, economic background.

To conclude, storytelling is the art of metamorphosing values into action, and transform abstract concepts and ideas into substantial experiences. By doing so, individuals can have a smother and enhanced understanding of certain actions and behaviors. The power of storytelling lies in its ability to transmit knowledge and values from one individual to another, and drive motivations and inspirations to take action in desired cooperative social behaviors. Furthermore, the inclusion of personal stories adds a peculiar dimension to the storytelling, as it connects individuals with the society, pushing away the barriers and obstacles that might push away this notion beyond the distinction, and lastly, behaves as an advocate for social action.

# Chapter 4: Dynamics of Sustainable Development Outcomes

4.1 Sustainability Development

Defining sustainability depicts a complex challenge, as it encompasses a wide range of interpretations and disciplines it implies. The existing literature reveals sustainability to be an approach and practice that guides the efficient utilization of present-day resources while also ensuring their availability and sufficiency for future generations. Adding to the notion, sustainability can also be perceived as the ability to make accountable and reliable decisions, from an individual to a group and up to a societal standpoint, in an effort to achieve desired social, economic, environmental outcomes. By ensuring a long-term health and resilience of our planet, promoting social inclusivity, and embracing long-term economic prosperity, we can pave the wat for a more sustainable world that ensures a high quality of life for present and future generations.

A key notion to be comprehended is the fact that even though sustainability and sustainability development share a common goal of promoting a more balanced and resilient future, they do so through distinct approaches and perspectives. While sustainability offers a long-term perspective and holistic thinking, sustainability development translates these aspirations into concrete strategies and actions that can drive positive change, as it can be visibly seen in the figure below. The prominence of this concept development is increasingly acknowledged as a critical pathway towards a better future, and at its core, it aims to strike a balance between environmental preservation, social well-being, and economic progress through a practical and action-oriented approach (Rosen & Kishawy, 2012).

Sustainability development has garnered substantial attention from policy makers and academics for a variety of reasons (Ozili, 2022). Within the policy sphere, the urgency surrounding sustainability and sustainability development has grown even stronger due to significant recent occurrences like climate change, the shift towards renewable energy, adoption to circular economy, etc. On the other side, within academia, scholars and researches have dedicated their efforts to investigating the elements that facilitate the achievements of sustainable development goals, with their objective being the generation of research outcomes that can derive meaningful and valuable insight for policymakers, assisting them in making progress aimed at effectively attaining these sustainable development goals, and most importantly, generate a positive outcome.

Figure 8. *Sustainability Development Magnitude*
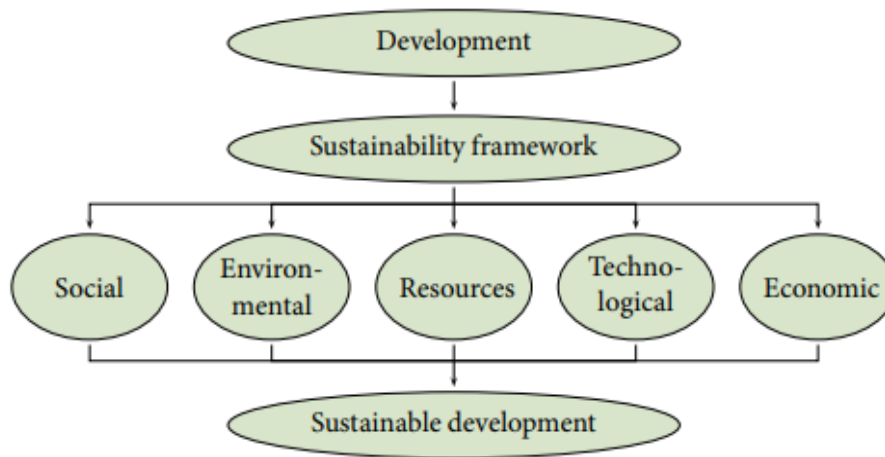
Source: (Ozili, 2022)

Recognizing the imperative and desirability of sustainable development for the future embodied the fundamental prerequisite for the international community to initiate proactive measures and start taking actions towards navigating sustainability challenges. By acknowledging the critical importance of sustainability development, actors and actions such as government bodies, individuals, policymakers, natural conditions, science and technology, criminal activities, can spur concrete actions via leveraging collective influence, resources, and expertise. The path towards sustainability in not without a challenge, and demands perseverance and innovative problem-solving (Elliot, 2012) . With that being said, it is essential to acknowledge the existence of certain limitations and challenges that pose obstacles to the advancement of sustainability development initiatives, thereby posing a potential threat.

Limitations associated with enhancing sustainable development arise from various challenges, and they are known as elements of bounded rationality. (Zee, 2022) These limitations, encompass factors such as time constraints, limited information, cognitive limitations, emotions, and ingrained habits. Furthermore, they affect not only the decision-making processes but they hinder the promotion of sustainable practices and actions. More often than not, time constraints and limited information interplay and complement each other, making it arduous for individuals to consider all relevant factors and potential outcomes. Findings from a consumer survey who aimed to understand the elements consumers considered in engaging in sustainable development of food shopping, revealed that time scarcity is a major constraint of their sustainable consumption (Ran, et al., 2022). This scarcity mindset can lead to a focus on short-term outcomes rather than long-term sustainability objectives (Doorasamy & Baldavaloo, 2016).

The presentation of information also plays a crucial role in decision-making process and the development of sustainability outcomes. The framing effect, which pertains to how information is presented affects decision-making outcomes, as the compatibility and alignment between information presentation and individual perception influence customer behavior dynamics regarding sustainability initiatives. Emotions on the other side are yet another fundamental limitation that shapes the level of bounded rationality in regards to human decision-making. They can considerably influence our attention, bias our judgment, outline our perception of information, ultimately hindering our ability to make optimal decisions. While the spectrum of emotions is inherently dynamic and diverse, certain emotions are closely associated with bounded rationality compared to others. Two emotions that are often associated with this phenomenon are familiarity and comfort (R.Parker, Lehmann, & Xie, 2016) & (Park & Lessig, 1981).

Familiarity can lead to a sense of security and trust, as we tend to rely on people, places, and things we are acquainted with and have had positive encounters and experiences in the past. For example, a persona may feel more secure using a particular brand of products that he has been using for years and has had a pleasant experience with, thus not being inclined to try new products. The use of plastic bags over paper bags for instance, is a tangible representation of how the level of convenience and familiarity leads customers to not accept a sustainable purchasing behavior initiative. For an extended period of time, plastic bags were the preferred and practical option for carrying groceries, but they came at a heavy cost for the environment, as their extensive use has resulted in an alarming increase in plastic pollution. The primary reason behind this practice and way of shopping by only utilizing just once plastic bags and later discarding them, rather than seeking a more sustainable option, relies on habit. As a consequence, it is well observed that single-use plastic bags have become a crucial factor contributing to the growing problem of environmental pollution.

In the same way, comfort tends to create a sense of ease, as individuals know what to expect in surroundings, situations, and products that are familiar to them, leading to a more relaxed state of mind. For instance, in the same logic of grocery shopping, it is generally more convenient and comfortable for customers to purchase in big supermarkets, as they can find there all the needed shopping items, from health to grocery shopping to home appliance etc., as the product portfolio is very diverse. Even though there are organic shops or small local business who provide fresher products that have fewer steps in the supply chain, thus releasing lower level of gas emissions and making a positive impact on sustainability practices, they are not a convenient option, since you have to go to different shops for different products.

In conclusion, sustainability development is inherently associated with the concept of change, and bringing about meaningful change cannot solely rely on conventional policy responses or technological advancements alone. To avoid being trapped in existing patterns, it is imperative to address also consumption patterns, individual and collective behaviors, and mindset. A new innovative strategy is the inclusion of storytelling and narratives as a unique tool that engages and inspires people Narratives are an innovative medium when it comes to communication theory, as they highlight the interdependence between human well-being and the health of the society. They have the ability to create connections, foster empathy, and convey complex ideas in a relatable and accessible manner, ultimately weaving sustainability narratives into the fabric of our society.

4.2 Pro-Environmental Decision-Making Refinement

Decision-making is an integral part of our daily lives and undertakings, whether we realize it or not. As members of society, we are constantly faced with decisions from a young age, and it is an inevitable part of life (Radhakrishnan, 2019). From choosing what to wear in the morning to making critical business decisions, we are constantly faced with choices that require us to weigh the pros and cons and make a decision. According to the prevailing notion, decision-making is a result of a problem caused by a mismatch between the current state of affairs and the desired state of affairs (Stefanov, Sofijanova, Arsovski, & Kimova, 2019). Simply put, decision-making is perceived as a tool for self-assessment, aimed at recognizing barriers that hinder individuals from attaining their objectives.

However, not all decisions are created equal, and some have more significant importance and consequences than others, and as such, the process and approach of decision making are not always straightforward. Moreover, the process is abounding in complexity, involving multiple factors and trade-offs that can make it difficult to achieve the desired outcome, and might require refinement to restrain the obstacles. In complex contexts, there can be numerous correct solutions and the cause-and-effect relationship may not be apparent to everyone, revealing the "known-unknown" concept (Snowden & E.Boone, 2007).

On the other side, ambiguity does drive up entrained thinking as an approach to become deeply ingrained and habitual over time. While entrained thinking can be beneficial in some situations, it can also lead to a narrow-minded approach and the inability to consider alternative viewpoints. This approach leads to failure to adapt to new circumstances, missed opportunities for growth and development, reluctance to change, etc. In my research purpose, in the context of sustainability-

promoting messaging and policy design, entrained thinking can make it difficult to communicate the urgency and importance of sustainability issues to individuals who are not already engaged with the topic. Lack of understanding and inefficient messaging strategies and channels makes it challenging to generate meaningful action or support for sustainable practices.

Decision-making refinement seeks to address these challenges by providing a framework for evaluation and improving decision-making practices and theories. These frameworks require the establishment of a variety of techniques and tools, including data analysis, risk assessment, cost-benefit analysis, scenario planning, intrinsic elements, scarcity appraisal, etc., that support choices that are suitable and adequate for a particular issue or requirement (Khosrowshahi & Howes, 2005). Refinement is diverse in nature, and it involves multiple perspectives and principles, based on their context and outcome appraisal. In the context of sustainability, due to its large reach and complexity, it involves a few additional steps to be taken.

The notion of pro-environmental outcomes that derive a sustainable lifestyle approach is frequently devoted to the balanced approach of economic welfare, social fairness, environmental prosperity, with the ultimate goal of providing these moral obligations and standards to the well-being of present and future population (J.Kibert, Thiele, Peterson, & Monroe, 2011). This holistic approach acknowledges that relationship between these three pillars of sustainability is complementary and mutually beneficial, meaning that there is a level of interconnection between economic, social, environmental practices. Thus, neglecting one of the building blocks of this chain relationship, does a collateral damage to the other, and vice versa. For this balance between these three practices to co-exist, a more detailed refinement of the customer behavior dynamics shall be assessed.

Needs and motivations of customers are a fundamental aspect of product development and operation, and individuals, businesses, governments ought to comprehend them in order to compete in the fast-paced dynamic business market (Camilleri, 2018). Individuals elucidate their needs and motivations through their purchasing behavior, serving as a valuable source of information and insight for organizations and policy makers. Through their purchasing decision, individuals obliquely reveal factors that influence them and the key considerations that drive their decision-making process. For years, there has been a substantial dispersion between customer motivations behind their purchasing behavior, involving the duality and dilemma between emotion intuition and rational argumentation.

Consumers that tend to make purchasing decisions based on more objective criteria, such as quality, price, functionality, and convenience, are identified as rational consumers. These

consumers are often associated with the traditional decision-making process (Bugajenko, 2017), which assumes that these individuals always act in their best interest and make decisions that maximize their utility and value for the price paid and cost incurred. On the flip side, consumers that prioritize purchasing decisions of products and services based on their feelings and emotional response, are considered as emotional consumers. These individuals are more likely to give precedence to factors like happiness, satisfaction, and empathy, or conversely impulsiveness, fear, and guilt. Integrating such emotions in the process, creates an impeccable relationship and connection in consumer mind, shaping an overall experience that is goes beyond the mere end product. This latter approach seems to drastically get more attention and interest from scholarly articles who investigate the dynamics of decision-making process, as displayed in Figure 9, as there is evidence of a utter revolution in the affective science (Lerner, Li, Valdesolo, & Kassam, 2015).

Figure 9. Yearly scholarly papers on emotion and decision-making
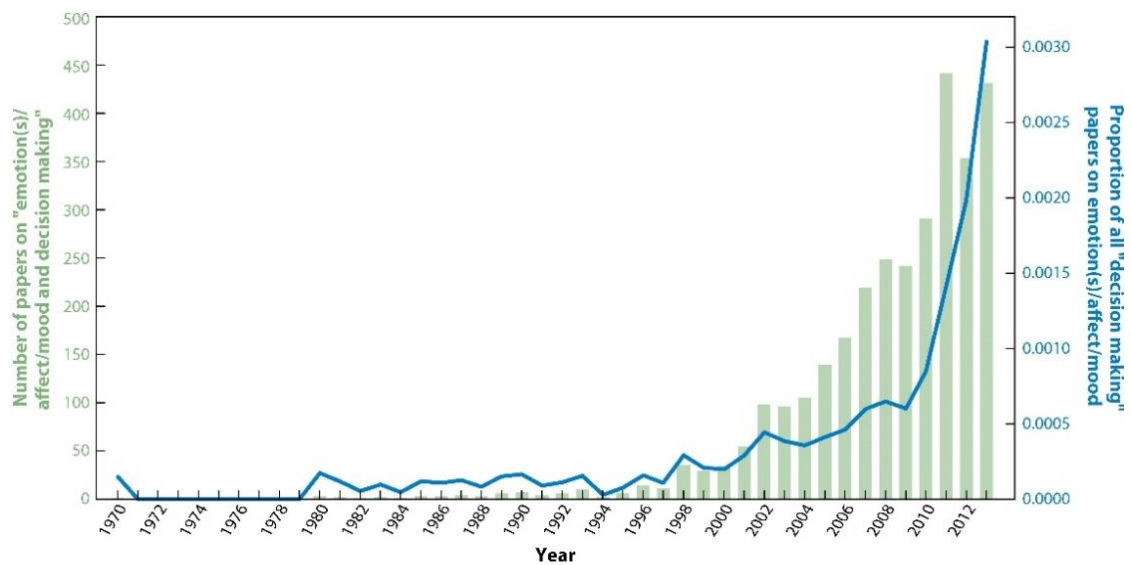
Source: (Lerner, Li, Valdesolo, & Kassam, 2015)

In conclusions, this theory has been accepted for many years, and recently was brought back to the fore by (Elsäßer & Wirtz, 2017) findings. Comprehending emotional and rational appeals is very essential and valuable, because businesses and policy makers can adjust their strategies and initiative in the same line of reasoning as their consumer's preferences, making it more likely for customers to follow a certain path of action, that is being presented, most particularly in the case of sustainability communication and promotion, if it resonates with their needs and motivations.

This makes the decision-making process very efficient for both parties involved, as it can be considered a win-win situation, combining efforts in a collaborative behavior.

Furthermore, the refinement of decision-making process becomes paramount in the context of pro-environmental outcomes, as it guides individuals through complex choices and dilemmas. The incorporation of emotional and rational appeals, as well as exploration of various factors and approaches in the refinement process, necessitates a deeper understanding of the mechanism through which individuals can make more informed and environmentally conscious choices, rendering the pursuit of pro-environmental outcomes a reachable and attainable objective.

4.3 Knowledge & Values as Choice Determinants

Individuals' decision-making processes are greatly influenced by a variety of factors (Gaur & Kant, 2021). More often than not, choices are based on personal needs and desires and driven by knowledge and set of values. Knowledge is generated through a systematic process of gathering and analyzing relevant information and is heavily associated with the rational approach to decision making. According to (Wiig, 1993), knowledge differs from information in that it encompasses truths, perspectives, beliefs, concepts, expectations, and know-how. Furthermore, knowledge is perceived as context-dependent and is typically gained and shaped through experience, observations and interaction with the environment (Baskerville & Dulipovici, 2006).

In the narrative approach of conveying meaning, stories commonly include elements of both knowledge and information. Knowledge is typically presented in the form of background context, such as displaying historical, cultural, and social information that helps to shape a certain narrative. Information, on the other hand, is presented in the form of specific facts, data, and details that can be observed as relevant to the decision at hand. For example, a narrative that highlights certain pieces of information over others may influence individuals to make decisions that are more in line with the narrative's perspective.

The access to relevant knowledge and information, is a detrimental and crucial factor in facilitating pro-environmental decision-making through narrative approach. In order for narratives to effectively shape individual's choices and foster desired behavior, firstly it is essential to have access to accurate and reliable information about environmental issues. This information serves as the first step and the foundation for fostering awareness for these hazards and furtherly allowing individuals and societies to understand the significance of their actions

Narratives can fill gaps in awareness and understanding of pro-environmental outcomes. It is widely acknowledged by philosophers and professionals engaged in this discussion and field of inquiry that human intentions are what reconfigure a mere movement to a deliberate action (Popova, 2022). Through narratives, the process of knowledge assessments becomes smoother and more streamlined. By weaving together engaging characters, compelling plotlines, and relatable situations that effectively capture attention and stimulate reflection, individuals can gain a more profound understanding of potential environmental hazards, thereby fostering their awareness.

Furthermore, individual personal beliefs and principles, which establish a system of values about what he perceives as important and desirable, add another piece to the decision-making puzzle. An individual's system of values is established by various constituents, and society is a significant contributor (T.Allison, R.Jordan, & Yeatts, 1992). Viewing narratives as socially constructed is a fundamental tenet of the constructivist approach. To fully embrace this perspective, one must take into consideration the socio-cultural context, structural conditions, and the actual interaction that gives rise to a narrative. A so-proclaimed "social interaction approach" to narrative analysis recognizes that narrative chronicles are shaped by a multitude of factors including time, space, environment, conversationalists, previous talk, action, etc. (M.Wittmayer, et al., 2019).

Values are a driving force of motivation, and can be conceptualized in different ways (C.Ravlin & M.Megino, 1987). One way to look at values is by discerning their nature as hierarchical, using prioritization or rank in a particular order as a reference point when making behavioral choices (Rokeach, 1973). This ipsative approach constitutes that individuals favor certain values at expense of others, in a trade-off where they elect to choose a path of action that obtains a preferred outcome. For instance, a customer who values sustainability and eco-friendliness may choose to buy products from companies that use environmentally friendly materials and manufacturing processes, even if it means paying a higher price, trading off its preferred value for a less prioritized value. Similarly, if a customer prioritizes quality and reliability, they may be willing to pay more for products that meet these standards and remain loyal to companies that consistently deliver high-quality products. They both might be willing to pay a higher price, the same outcome, but for completely different reasons, and different prioritization of values, that can be exchanged for each other (Parguel, Benoit-Moreau, & Russell, 2015) .

The second perspective on values does not account for the intrinsic approach of organizing beliefs and needs in a personal hierarchical manner, but rather on an extrinsic approach, accounting for influences of social values. This approach shifts the attention and awareness scope to general patterns of behavior that an individual shall exhibit, shaped by the overall shared beliefs and efforts

of a social system or community. The core idea of this approach is to induce individual values adequate to social values, due to the fact that these values are perceived to be obligatory from a moral and ethical perspective (Schwartz, 2012). The importance of values such as honesty and integrity, compassion and empathy, respect for the rule of law etc., is arduous to measure and rank hierarchically, but nonetheless, is a great representation of how society shapes constrained choices (Kluckhohn, 1951).

The alignment of an individual's values with those of the broader society is an ongoing process of refinement and adaptation, as social norms and expectations change over time, as do individuals needs and preferences. As society evolves and changes, so too do the values and moral that guide it. Individuals must continually asses and adjust their values and beliefs in response to changing social norms and expectations, and failure to do so may result in values that become out of step with those of the larger community, potentially leading to social isolation and conflict. As I previously discussed, group influence, which is a derivation of influence by larger community social norms and morals, is associated with the level of comfort and trust (E.Asch, 1956). This is a key factor in why change can be such a difficult phenomenon to achieve, particularly in regards to shifting behaviors and attitudes towards pro-environmental outcomes.

In addition, habitual behavior plays a crucial role in the decision-making process and can contribute to maintaining non-change behavior (Aarts, Verplanken, & Knippenberg, 2006). Habitual behavior is strictly associated with prior values and attitudes, and is deemed as an automatic response to any given situation, requiring minimal cognitive effort and conscious decision making. This approach certainly limits the potential for individual decision-making refinement, often bypassing more deliberate and rational thinking, but also emotional appeals and experiences. As a result, individuals may continue to engage in certain behaviors, being reluctant to other alternatives for lack of awareness and conscious reasoning, automatically triggered when there is a need for an action to be made.

The frequency of past behavior and prior attitudes can directly impact future behavior, especially in sustainability behavior engagement and promotion. Skepticism or indifference can hinder individual's motivation to engage in sustainable behavior, making it more difficult to change their behavior even in the face of compelling evidence or persuasive communication (Oschatz, Niederdeppe, & Liu, 2021). Skepticism can arise from a lack of trust in the information and the source of information, questioning the validity of the argumentation and rhetorical language derived from statistics that provide information about the sustainability promotion campaigns.

Indifference, on the other hand, is a more passive attitude, and its associated with level of attention, awareness, engagement, conviction, all elements of emotional appeals.

In conclusion, the influence on individual decision-making is a complex interplay of a variety of actors, and is not always straightforward or predictable. The availability and quality of information, knowledge appraisal, cultural influence personal belief, societal values, prior attitudes and behavior, all play a role in shaping individuals choices. Therefore, it is essential to take a holistic approach, taking into consideration the broader socio-cultural context and interaction that gives rise to a narrative, in order to have more effectiveness in promoting positive outcomes.

## 4.4 Leveraging Emotional Response

Today more than ever, our society faces the urgent task of developing and adopting a more sustainable lifestyle, due to the pervasive impact of unsustainable actions that have been conducted for years. Climate change, pollution problems, waste of energy, destructed biodiversity, and food safety concerns, are some of the main issues that impact each and everyone's lifestyle, and unfortunately, they are as a cause of this unsustainable lifestyle. It would be naïve to justify these consequences as a cause of lack of information or awareness, the writing is on the wall and it is increasingly evident. But being aware of these pressing issues is not sufficient, as this tends to overlook the urgency of taking practical sustainable actions. To bridge the gap, social and behavioral sciences are researching the drivers of sustainable behavior change, while policy makers should leverage insight to devise innovative intervention policies and strategies, in order to enhance efficiency (Brosch & Steg, 2021).

Until now, behavioral research has predominantly emphasized cognitive factors that involve rational appeals as the main referral. Factors like prior beliefs, individual values, risk perception, bounded rationality, social norms, as elaborated in the previous sections, have been the main target of the most interventions and communication strategies, targeting cognitive processes to induce behavioral change (Hahnel, Chatelain, Conte, Piana, & Brosch, 2020). Some of the interventions linked with these cognitive rational appeals can be highlighting the personal benefits derived from sustainable purchasing behavior, desired pricing strategies to incentivize sustainable purchasing behavior, providing transparent information through labels to certify sustainable products, encouraging sustainable actions by leveraging social norms and ethics in order to create a sense of social influence and responsibility, etc. These rational appeals have had as successful track record of results in the intended behavior change, but their scope is restricted.

Emotions are an integral component of the human cognition, often viewed as an irrational force that interferes with cognition and reasoned though in the decision-making process. They are evoked when a certain behavior is perceived as relevant to one's concerns and values, assisting these individuals to detect and understand potential risk and opportunities (Brosch, 2021). Prioritizing value concerns that are at risk stimulate negative emotions, while supporting values results in positive emotions. This appraisal action occurs via effortful method of associative and reasoned-based mechanism, a duality between previous experiences and prior beliefs as well as new opportunities derived through a thorough and compliant analysis.

Furthermore, the purpose is to promote positive emotions and avoid negative ones. By doing so, emotions function as an adaptive filter that directs our thoughts and action toward events that align with concerns and values, as presented in Figure 10. Thus they drive cognition by influencing how information is selected, drive action by triggering motivational action tendencies. Ultimately, this profound interconnection shows that emotions have a pervasive influence in our thoughts and action on various levels, pointing out the importance of acknowledging their role in the context of sustainable behavior change.

*Figure 10. Emotion-Cognition-Behavior*
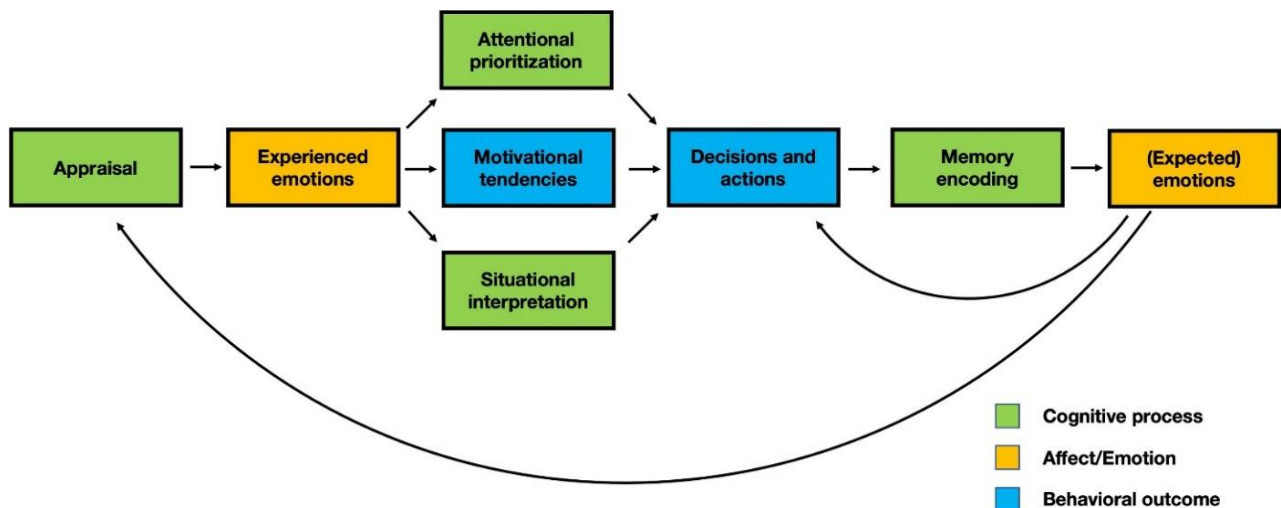
Source: (Brosch, 2021)

One efficient way emotions are leverage for pro-environmental outcomes, is through alteration of people's risk perception. Research has shown that emotions can significantly alter risk perception,

leading to either an overestimate or underestimate of the likelihood and severity of potential risks. (Dunlop, Wakefield, & Kashima, 2008). Different types of emotional responses can arise from exposure to narrative communications, such as those linked to the message itself, the plot, and individual's personal experiences. Among these, emotional reactions that are perceived as self-referential, meaning that the individual directly relates to the personal experience of a story, are thought to be particularly effective in driving behavioral change by enhancing perception of personal risk.

Most recently, latest discoveries and developing patterns regarding the influence of emotions and affect on people perception and assessment of climate change, as well as their potential to encourage sustainable actions, were observed through a conducted review by (Brosch, 2021). The results indicate that the emotional reactions individual perceived toward climate change are consistently recognized as the most influential factor in predicting risk perceptions, adoption of mitigation behavior, and support for sustainable policies. As indicated in Figure 11 below, both potential emotion and affect are important intrinsic motivators reinforce sustainable actions, as they operate as a consequence of pro-environmental behavior, and as a behavioral antecedent.

Figure 11. Pro-Environmental Behavior
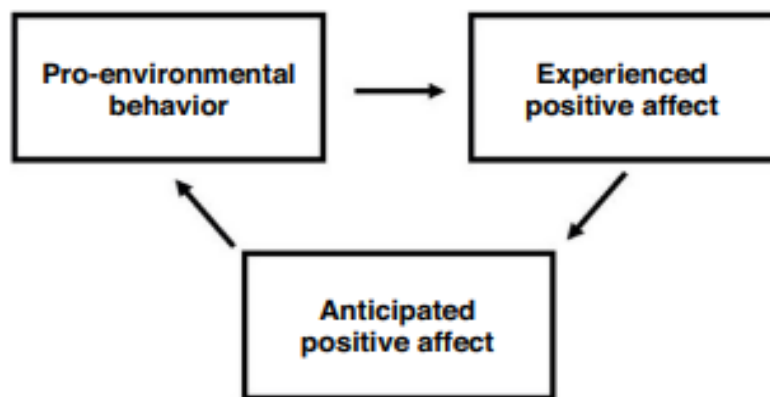
Source: (Brosch, 2021)

This notion ultimately highlights the importance of awareness and action encouragement through clear comprehension of higher level of risk associated with unsustainable behavior. When examining a certain behavior that has adverse impacts on the society and environment, individuals activate their human cognition mechanism to prevent repeating previous behaviors. This can occur when negative emotions such as guilt, fear, and empathy are triggered, leading them to be more proactive in making sustainable choices, as the perceived risk outweigh the benefits of continuing

with unsustainable behavior. In this way, by associating negative emotions with the negative effects of certain behavior, can serve as a powerful motivator for individuals to make sustainable choices.

4.5 Ethical Consideration of Sustainable Behavior

Ethics is a complex and multifaceted subject that can be challenging to comprehend. It involves understanding and navigating various moral principles and values, cultural norms, and legal regulations that govern human behavior. As it was previously stated, customers are often driven by a range of factors, including personal values, prior beliefs, cultural norms, and individual preferences, making it difficult to determine what is ethical behavior in any given situation. The perception of what is ethical can differ greatly among various societies, groups, and individuals. This variability implies that what is considered morally acceptable in one context may not be viewed similarly in another, and vice versa (Vitell & Muncy, 1992).

Ethics plays a vital role in decision-making by enabling individuals and organizations to make responsible choices that positively impact society. The incorporation of ethical considerations in decision-making helps to ensure that choices align with moral principles and values. Conversely, the disregard for ethical principles can result in decisions with adverse consequences for individuals, organizations, and society as a whole. Hence, it is crucial for individuals, organizations, and policymakers to have a comprehensive understanding of ethics and its role in decision-making. This understanding facilitates the ability to make informed, responsible, and sustainable choices that prioritize the welfare of all stakeholders. To comprehend the process of ethical decision-making, it is crucial to define what constitutes an ethical decision.

According to (Watts, 2020), an ethical decision satisfies three fundamental principles known as the 3 C's of ethical decision-making, which are compliance, consensus, and consequences, as illustrated in Figure 12. These principles are applicable not only to the decision's content but also to its implementation. The compliance principle indicates that a decision is ethical when it adheres to explicit regulations such as organizational policies, industry standards, or legal statutes. The consensus principle suggests that a decision is ethical when it is perceived as such by the majority of members within one's society, guided by implicit norms and values that dictate socially acceptable conduct. Finally, the consequences principle dictates that a decision is ethical when it maximizes benefits and minimizes harm for the greatest number of individuals.

Figure 12. Ethical Decision-Making Model
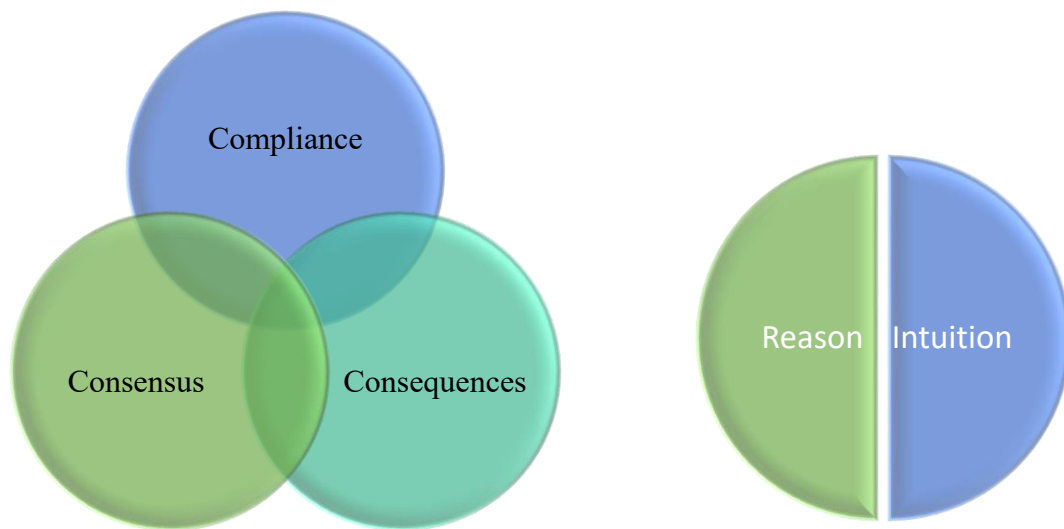
Others argue that to arrive at an ethical decision, individuals need to consider and follow a few essential steps. First and foremost, they must acknowledge that there is an ethical issue at hand, a dilemma stimulated by the recognition of potential consequences that a certain behavior or act has. For sure, whether or not this dilemma is perceived as ethical or unethical, is strictly associated to individual's attitudes and biases, but in a general approach, it is well aware to the public mass that a certain behavior is unethical by default. Sustainability behavior falls into this category, as it is becoming increasingly recognized that sustainability is not just an environmental concern, but also an ethical issue (Amantova-Salmane, 2015). After recognition, individuals must be inclined and motivated to take an ethical stance and act accordingly. Awareness and recognition by itself are not sufficient for an act to take place, there must be some incentives that boost a genuine desire, and guide customer behavior toward an ethical observance, ignited by either personal values and social values, or by other exogenous variables.

While the ethics of sustainability will inevitably be influenced by a variety of exogenous and endogenous factors, in order to be proactive rather than reactive to these ethical dilemma, and thoroughly analyze the situations to determine the right course of action, it is possible to outline some principles that sustainable ethics should embody to a certain extent. For instance, sustainability by its very nature is forward-looking, and therefore ethical considerations surrounding sustainability must take into account the relationships between present and future generations. Additionally, like any social ethics, sustainable ethics should address questions of

rights and interests. Furthermore, practicality and feasibility are important aspects of sustainable ethics, and individuals and groups may bear responsibilities in relation to the rights and interests of others. (Amantova-Salmane, 2015).

Ultimately, the goal of sustainable ethics is to provide guidance for addressing real-world challenges and creating more socially, environmentally, and economically sustainable institutions, practices, and societies. However, it is important to recognize that sustainable ethics cannot be confined to the realm of theory and must be practically applied in order to be effective, as the concept of sustainability is hollow without ethical considerations (Zagonari, 2022).

4.6 Narrative Risk Communication

The field of risk communication has made significant strides in its evolution, expanding both in scope and complexity, as scholars and practitioners have delved deeper into the subject. Despite all this progress and advancements, there still remains a disheartening reality where individuals consistently disregard warnings and fail to take proactive measurements in the face of risk and hazards (Lejano, Jr., Pormon, & Yanger, 2020). This undesired trend is furtherly observed in hazards that are derived from natural disasters, such as floods and storms, which poses a threat not only to individuals but also to the society as a whole. The consequences of such inaction can be severe, and understanding the underlying factors causing this lack of response is essential and urgent.

The goal of hazard communication is to mitigate vulnerability by bridging the gap between the scientific predictions of risk and the public perception of risk (Shanahan, et al., 2019). In various fields, such as public health, environmental safety, and crisis management, the traditional methods of risk communication have often fallen short in engaging and influencing audiences, thus not achieving the aforementioned desired goal. The challenge of making risk messages relevant to the general public on a personal level, alongside with communication language that is often perceived as overly technician and lacking genuine engagement, are perceived as the main obstacles in effectively disseminating risk information and engaging in risk mitigation efforts (Lejano, Jr., Pormon, & Yanger, 2020).

Figure 13. Risk Communication Interrelationship (Infanti, et al., 2013)

Source: (Infanti, et al., 2013)

This opens up opportunities for the exploration of alternative and innovative approaches, with narrative inclusion being a propitious avenue to consider. Narrative risk communication is a compelling approach that groups together narrative messaging and sustainability initiatives, seeking to effectively convey information about hazards and uncertainties through storytelling techniques and elements. Narrative effects in risk communication may arise in three ascending stages, micro level, meso level, macro level (Cho, 2014). At the micro level, effects encompass the evaluation of attitudes and actions pertaining to risk mitigation, subsequently at the meso level, effects encompass the dynamics of interpersonal and intra-community interactions and communications, and lastly, on a macro level effects encompass the influence of media attention on risk related matters along with the publics judgment concerning the origins and remedies of societal risk issues.

By weaving narratives into risk communication efforts, it becomes possible and achievable to capture people's attention, sustain their interest, and facilitate a deeper understanding of the risk at hand. The storytelling dimension adds a peculiar advantage, due to the fact that integrates a variety of elements, such as characters, plot, and theme with specific messaging context and content, such as emotional and rational, merging them all together with the goal of raising awareness and initiating behavioral change. To be noted is the fact that the raise of awareness and captivation of people's interest is merely the initial phase, and does not signify the ultimate goal, since desired risk reduction actions and behavior is not yet achieved at this point.

Narrative risk communication relies heavily on the phenomenon of persuasion, which is intricately linked to the distinct structure inherent in narratives itself (Shanahan, et al., 2019). A key element

of narrative persuasion is character utilization, particularly through the strategic incorporation of heroic figures and vulnerable victims. Characters serve as powerful vehicles for storytelling for a variety of reasons. Firstly, they enable individuals to connect emotionally with the narrative and its underlying message, thus enhancing a level of personification with the main character. In the case of pro-environmental behavior for instance, incorporating heroic figures such as environmental activist or individuals taking every day bold actions can inspire the audience to emulate their courageous behavior.

Simultaneously, the inclusion of vulnerable victims in narratives is deemed essential due to the creation of a sense of empathy and urgency with the audience (Talgorn & Ullerup, 2023). Their plight and struggles evoke deep emotions, such as fear, anger, and guilt, compelling individuals who are exposed to this type of messaging to act and prevent further harm to the environment. Both these character dynamics share a common purpose and goal, albeit through distinct methods and approaches. In the upcoming chapters, a closer examination will be conducted to explore the intricate relationship between narrative persuasion messaging through character utilization and subsequently their profound impact on the pro-environmental outcomes

Chapter 5: Methodology & Data Analysis

5.1 Methodology

The following chapter delves into the in-depth exploration of the methodology used to gather and meticulously analyze data that are essential for this study research purpose. The focus of this research delves into the profound influence of narrative persuasion elements and dynamics on the cultivation of desired sustainability outcomes, aiming to understand the degree of correlation between certain narrative and storytelling appeals and techniques and action towards a more sustainable behavior. Within this context, the particular emphasis lies on unraveling the intricacies of awareness, positive and negative affection, risk perception, action toward sustainable behavior and their pivotal role in achieving sustainable goals.

The considered sustainability endeavor elected for the statistical analysis is flooding, generally recognized as the weather related hazard that is most widespread around the globe (Doswell, 2003). This phenomenon poses a challenge and a threat due to its environmental impact, such as causing significant damage to ecosystems and natural habitats, economic losses, such as cost associated with the recovery and reconstruction of the damages, social disruption, causing a community disruption due to the forced evacuation of millions of people from their homes. The study will utilize various statistical measurements and analysis, primarily aimed at understanding the variance of controls age and gender in two categories. First category is related with how does the specific narrative messaging influence the awareness and perception of the risk generated with this natural disaster. Secondly, the goal is to understand if this awareness and risk perception derived through narrative manipulation can effectively translate into real actions and behavioral change towards addressing and managing the minimization of the impact derived from this sustainability hazard.

5.2 Data Analysis

This study derives data from a pre-existing experiment study conducted by (Raile, et al., Narrative Risk Communication as a Lingua Franca for the Environmental Hazard Preparation, 2021), which establishes valuable insights and derives meaningful findings in regards to the effectiveness of incorporating narrative elements and narrative persuasion techniques into risk communication, specifically in relation to environmental hazards. Data was extracted through a survey experiment conducted with residents living in Montana, United States of America, who live along or near to

the susceptible to flooding Yellowstone River. The number of survey participants, which translates and correlates to the number of observations used in the modeling is 1938 (N=1938). The study analyzed the observations through a parallel and serial mediation statistical model, with participants being randomly manipulated with a narrative massage that included character expressed as scientific, hero, victim, victim-to-hero, as well as a control group which was deemed as the base group.

The findings indicate that the decision to include narratives in the environmental risk communication content was very efficient and elicited positive affective responses as well as improved change of behaviors toward pro-environmentally behaviors. Furthermore, the findings imply that narratives that involved inspirational hero character language was the most efficient and superior in comparison to the other narrative character languages in encouraging preparation for environmental disasters. These results highlight the superiority of the hero language over fear or victimization language in effective risk communication, and provide a pillar and crucial starting point for future research as well as significantly aid policymakers in shaping adequate communication strategies that would incentivize individuals to adopt and promote sustainability initiatives.

The decision to utilize the data from (Raile, et al., Narrative Risk Communication as a Lingua Franca for the Environmental Hazard Preparation, 2021) research was made for several reasons and factors. Firstly, the original study sets out a substantial foundation for the inquiry of the impact of narrative persuasion on sustainability outcomes, which stands on the same line of reasoning and scope as my research purpose. By building upon this established research, I can leverage its findings to further investigate and expand the understanding of the topic. Secondly, the study integrated a large and divergent sample size, which ensures the reliability and generalizability of the data, both elements being very essential for the integrity of the study. Utilizing this abundant dataset allows for robust statistical analysis and furtherly enhances the validity of my conclusions. Moreover, by examining the variables related to the sustainability outcomes, I can contribute to the existing body of knowledge and build upon the conclusion drawn by the original study, providing another point of view of the data analysis and a different methodology approach. This continuity in research will ensure consistency and coherence within the broader field of narrative persuasion and storytelling techniques and their profound influence on deriving sustainability outcomes that intend to mitigate risk and encourage individuals to have a positive impact on society, economic, environmental initiatives.

5.3 Hypothesis Assessments

The primary purpose of my research is to explore potential variation between female participants concerning the study variables, seeking to discern if there are any gender-specific disparities in relation to the fostering of awareness and risk perception of environmentally hazards as well as the encouragement of positive action and behaviors toward pro-environmentally initiatives. The idea behind this research purpose derives from evidences supporting the notion that there exist gender differences in social behavior, comprising communication styles and approach. This notion was most profoundly presented and furtherly investigated by (Eagly & Wood, 1991) & (Yang, et al., 2016) & (Balsen, 2014) & (Zelesny, Chua, & Aldrich, 2002), and they present interesting findings that shed light on the importance of gender dimension and competence as an imperative constituent in general communication behaviors but also specific sustainability communication and mobility behaviors.

Furtherly, as previously mentioned in the previous chapters, tailored approaches to communication strategies have been found to be more effective in addressing the needs and preferences of targeted audiences, and a one-size-fits all approach might not present a clear picture of the subject in matter. While the original experiment survey investigated both genders collectively, this study seeks to conduct this gender-specific analysis to deeper understand the influence of narrative persuasion on sustainability outcomes, and derive insight pertaining to which message type and content might be more persuasive and encouraging for each gender.

H1: There is a statistically conclusive and positive relationship between the exposure of females to narratives and their subsequent pro-environmental outcomes

Secondly, my study will be concentrated in the age-related aspect of the study variables outcomes, seeking to understand if there is any difference in the correlation between narrative persuasion through message type and environmental hazards. Same logic as the gender-specific analysis correlates also on the age-specific analysis, and the original study did not concentrate in the disparity between age groups in relation to the aforementioned study variables outcomes. By conducting an analysis that specifically focuses on different age treatments, this research aims to gain insight into how age influences the impact of narrative persuasion on fostering sustainability outcomes, ultimately getting a conclusion about which communication and narrative elements as well as techniques are more fruitful and adequate to specific age groups, if any variations exist at all.

Research by (Horton & Spieler, 2007) & (Bolderdijk, Gorsira, Keizer, & Steg, 2013) provide clarity and insight in regards to the role of values as a significant influencer in promoting pro-environmentally behavior. Moreover, these studies are pillars and great starting points for my study due to the fact that they highlight that different age groups encompass distinct set of values, beliefs, attitudes, and underscore the fact that it is essential to consider age-related variations when developing targeted sustainability communication strategies and interventions through narratives. This is another step into understanding the value orientations of specific age groups, and policy makers can design communication campaigns that include adequate language and storytelling that will resonate with the unique perspectives of different age groups, and ultimately with the goal of enhancing their likelihood of adopting pro-environmental behavior.

H2: There exists significant difference in the correlation between narrative persuasion through message type and pro-environmental outcomes among different age groups

5.4 Study Variables

This study will involve the examination of various variables, which will provide with a more comprehensive understanding of the impact of narrative persuasion on pro-environmental outcomes. The original study involved 15 study variables, which were categorized in three groups. The first group involves predictors of the model, based on the message and narrative exposure to individuals. In the original study, the base message group was labeled with number 5 (5=base), but in this study, since I am using the STATA statistical software, I decided to label it with the number 0 (0= base) due to the fact that this specific software puts the control group (base message) as the firs pillar of analysis when running different statistical measurements and computations. As it pertains to the other study variables, no other changes or adjustments were made, and they were derived and extracted in the same form and approach as in the original study, in order to minimize any unintended mistake in the testing of my new hypothesis.

As it pertains to the message exposure variables of this study, they are all binary indicators and each message has a different approach in the communication content and context, as well as in the character dynamics, which is indeed the main manipulation check for each of the treatments. Base message exposes individuals to basic and usual definitional messages regarding the extreme environmental hazards and challenges that are more very evident in the area of residency of each individual. On the other hand, science message is constructed of conventional and argumentative

communication techniques, specifically using probability and certainty language to influence the audience risk perception and affective responses.

Hero message, victim message, and hero-to-victim message integrate the emotional and affection level of the narrative persuasion, another key element perceived to be crucial when it comes to engagement and conviction potency that these storytelling techniques poses, which ultimately aim to initiate pro-environmentally actions and behaviors. The original study employs in these message language two distinct characters for hero message treatment and victim message treatment, a hero characters who are perceived as saviors and are tasked with resolving problems, and a victim character are the ones who endure the harm derived from these problems. The utilization of hero and victim characters has been perceived as an effective and persuasive techniques in character and narrative theory, through their identification with the audience and their influence and prediction of audience reactions (Shanahan, et al., 2019).

The second group of study variable pertains to the outcome variables, aiming to understand the correlation between narrative persuasion messaging treatment and affective responses (positive & negative) as well as risk perception and mitigation behaviors. Participants of the survey were asked to assess the degree to which they were encountering each of the positive and negative feelings attached to the specific message treatment from 1 to 10 (1 representing "not at all" and 10 representing "extremely"). Positive affective response is measured on the likelihood of the experience of the affirmative elements that are correlated with risk perception and pro-environmentally behavior (the risk of extreme flood in Yellowstone river), including but not limited to feelings of inspiration, proud, determination, encouragement etc. Alternatively, negative affective response is measure on the same logic of assessment from 1 to 10, but in this case this variable represents feelings such as fear, anxious, distressed, etc., primarily correlated to the risk perception of the flood. The study utilizes the risk of the extreme flood in the area as the constituent to the risk perception behavior and risk mitigation behavior, focusing on one of the biggest environmental challenges of the area.

Additionally, the original study focuses on the risk perception paradox and intends to investigate the association between perceived risk and the subsequent actions and behaviors undertaken to alleviate the cumulative risks stemming from flood-related adversities. The study highlights also the mediation between negative and positive affective reactions and how they stimulate awareness and risk perception towards environmental issues that have a crucial impact on our day to day lives, and how this association translates into change of behavior and action taken to mitigate the risk and establish desired pro-environmental outcomes.

The variable personal risk perception, represented as a multiplicative indicator ranging from 1 to 25, assesses individual's perceptions of their own personal risk attained from the environmental hazards discussed in the study. The initial component of this outcome variable pertains to each participant's assessment of the probability that their dwelling would sustain significant damage in the event of severe flood (featuring response alternatives ascending from "extremely unlikely" to "extremely likely". Secondly, the same ascending response methodology is utilized, computing an average based on the self-reported assessment of the likelihood of significant personal economic loss disrupted by the environmental hazards, and how much it would upheaval and disturb each individual's personal life.

The study variable intended risk mitigation behavior is deemed as one of the most important and essential for both the original study as well as my study, due to the fact that is strictly correlated with the behavior change and actions towards an engagement with the pro-environmentally initiatives in a general outlook, and engagement with the specific flood mitigation initiatives for the participants of this study. Responses alternative for this study variable ascended from "definitely will not do it" up to "definitely will do it", employing a five-point rating scale. The aggregate score, as displayed in the table below, ranges from 0 (participants would definitely not engage in in flood reduction initiatives that they had previously not undertaken) to 1(participants will definitely engage in any flood reduction behavior that they did not engage previously).

In conclusion, the third group of study variables correlates to the 10 covariates of the study. In the context of my study, age and gender play a pivotal role as the primary covariates that hold significant important. Both of these variables are crucial and have the potential to exert considerable influence on the outcomes under investigation, and allow for more nuanced and insightful findings. **Age** is categorized in an ascending manner, commencing from youngest to the most senior cohort, categorized as 1 for the age group (18-29), 2 for the age group (30-39), 3 for the age group (40-49), 4 for the age group (50-59), 5 for the age group (60-69), 6 for the age group (70-79) and 7 for the age group (80 or more). The covariate **female** represents female identity, with 0 portraying (other) and 1 portraying (female).

Other covariates are represented and explained as follows, with their variable label in parenthesis: **highest education** (highedu) level is portraying in an ascending manner from lowest to highest education obtained, categorized as 1 (did not finish high school), 2 for (high school diploma), 3 for (some college experience), 4 for (2 year college degree), 5 for (4 year college degree), and lastly, 6 for (graduate and/or professional degree); **yearly income bracket** (income), categorized as 1 for (less than $20,000), 2 for ($20,001-$40,000), 3 for ($40,001-$60,000), 4 for ($60,001-

$80,000), 5 for ($80,001-$100,000), 6 for ($100,001-$150,000), and 7 for (more than $150,000); **time in residency** (howlong) captures the duration of participants residence in the current location they reside, categorized as 1 for (less than 1 year), 2 for (1-3 years), 3 for (4-10 years), and 4 for (more than 10 years); **residence in a floodplain** (fldpln2) portrays whether survey participants currently reside in a risky flood-prone are, categorized as 0 (no) and 1 (yes); **property elevation** (elev) demonstrates the elevation level of individuals properties in meters; **flood experience** (expflood) represented as a dichotomous question, as 0(no) and 1(yes), indicating whether participants have a prior experience with flooding environmental hazard; **undertaken behaviors** (donwtd) indicates whether participants have undertaken significant actions toward this environmental hazards, represented as a weighted index(0.000 to 0.895); **perceived self-efficacy** (effmea), measured as an averaged indicator that reflects participants beliefs in their own ability to perform desired pro-environmental behaviors if needed, categorized with an ascending scale from 1(low belief) to 5(high belief). Below is presented a table containing detailed and essential information regarding the descriptive statistics of all study variables.

Table 1. Descriptive Statistics of Study Variables

Variable	N	Mean (SE)	N	Mean (SE)	N	Mean (SE)	N	Mean (SE)	N	Mean (SE)
	Base		**Science**		**Hero**		**Victim**		**Victim-to-Hero**	
Positive Affective Response	200	2.146 (0.071)	415	2.112 (0.043)	442	2.459 (0.046)	435	2.242 (0.045)	446	2.420 (0.046)
Negative Affective Response	200	1.372 (0.042)	415	1.347 (0.028)	442	1.371 (0.029)	435	1.400 (0.027)	446	1.416 (0.030)
Personal Risk Perception	200	6.770 (0.402)	415	6.573 (0.279)	442	6.490 (0.264)	435	5.880 (0.255)	446	6.278 (0.263)
Perceived Self-Efficacy	200	3.439 (0.067)	415	3.525 (0.044)	442	3.466 (0.044)	435	3.572 (0.040)	446	3.504 (0.044)
Undertaken Behaviors	200	0.046 (0.007)	415	0.051 (0.005)	442	0.056 (0.005)	435	0.055 (0.005)	446	0.038 (0.003)
Property Elevation	200	10.010 (0.846)	415	11.779 (0.763)	442	10.938 (0.578)	435	12.054 (0.698)	446	11.637 (0.676)
Flood Experience	200	0.195 (0.028)	415	0.193 (0.019)	442	0.219 (0.020)	435	0.202 (0.019)	446	0.200 (0.019)
Residence in Floodplain	200	0.350 (0.024)	415	0.347 (0.019)	442	0.339 (0.017)	435	0.375 (0.018)	446	0.331 (0.017)
Time in Residence	200	3.445 (0.052)	415	3.484 (0.036)	442	3.434 (0.035)	435	3.492 (0.034)	446	3.442 (0.034)
Income	200	4.015 (0.125)	415	4.149 (0.092)	442	4.208 (0.086)	435	4.048 (0.084)	446	4.289 (0.086)
Female	200	0.470 (0.035)	415	0.424 (0.024)	442	0.425 (0.024)	435	0.407 (0.024)	446	0.426 (0.023)
Age	200	4.470 (0.103)	415	4.431 (0.063)	442	4.330 (0.069)	435	4.395 (0.069)	446	4.363 (0.067)
Highest Education	200	3.995 (0.106)	415	3.988 (0.072)	442	4.081 (0.071)	435	4.030 (0.070)	446	4.074 (0.069)

Chapter 6: Results

This chapter will imply the most pivotal part of my research analysis and purpose, as it will encompass the section where the main findings will be derived and the hypothesis will be tested. To ensure clarity and coherence, this chapter will be thoughtfully divided into two distinct sections, each dedicated to the examination of data derived from the survey for the two key covariates that I have selected to study in-depth. In addition, these results will offer a more in detail analysis of the treatments and approaches that were not investigated in the original survey, aiming to provide a different context and point of view regarding the analysis of this diverse datasets, but most importantly, aiming to make an even greater contribution to the understanding of the influence of narrative persuasion on sustainability initiatives.

The initial section will meticulously explore and investigate the variable treatment of "Female", aiming to uncover valuable insight and discern any noteworthy patterns or correlations. This rigorous investigation will conceivably shed light on the potential influence of this gender-specific on the pro-environmentally sustainability outcomes, allowing for a comprehensive understanding of its impact within the context of my study. Subsequently, the second part of this chapter will delve into the dataset of the variable treatment "Age", dissecting whether age plays a significant role in the shaping of the pro-environmental outcomes and to what extent, if any.

6.1 Original Study Findings

To start off with the findings observations, Table 2 showcases the main findings extracted from the original study. These findings serve as a foundation for the newly uncovered insights, as well as a valuable benchmark for the comparative analysis of the new discoveries. Certain key points and patterns are observed in these results, starting off with the impact of each narrative message on the study outcomes. Findings indicate that all of the narrative messaging (hero, victim, hero-to-victim) influence the outcome "Positive Affective Response" in a positive manner, with hero message being the greatest predominant influencer. Subsequently, the study found that there was no level of impact in regard to the outcome "Negative Affective Response" spurred by the introduction of narrative messaging, most importantly stating that there is no variation between victim messaging and larger negative affective responses as compared to the other narrative messaging. Relating with the third outcome "Personal Risk Perception", victim and victim-to-hero narratives are associated powerfully with reduced risk perception, but since these findings do not

elicit a negative emotional response, as a consequence, these narratives are unable to influence risk perception through the affect heuristic in the dataset, leaving the findings being unrelated to the experimental treatments. Lastly, conventional base messaging was deemed as being significantly associated with the outcome variable "Indented Risk Mitigation Behavior". Table 2 presents in detail all the main findings of the original study.

Table 2. Original Study Findings

Variable	Positive Affective Response	Negative Affective Response	Personal Risk Perception	Intended Risk Mitigation Behaviors
Hero Narrative	0.344***	0.003	-0.472	-0.001
	(0.000)	(0.927)	(0.118)	(0.894)
Victim Narrative	0.127**	0.057	-0.825***	0.014
	(0.043)	(-0.126)	-0.006	(0.227)
Victim-to-Hero Narrative	0.333***	0.0675*	-0.591**	-0.004
	(0.000)	(0.070)	(0.049)	(0.701)
Base Narrative	0.023	0.004	-0.177	0.0275**
	(0.775)	(0.932)	(0.638)	(0.050)
Perceived Self-Efficacy	0.0760***	-0.227***	-1.864***	-0.0250***
	(0.002)	(0.000)	(0.000)	(0.000)
Undertaken Behaviors	1.220***	0.316**	1.841*	0.239***
	(0.000)	(0.018)	(0.087)	(0.000)
Property Elevation	-0.001	-0.00174*	-0.0784***	-0.000583**
	(0.504)	(0.059)	(0.000)	(0.039)
Flood Experience	0.129**	0.144***	0.560**	-0.002
	(0.014)	(0.000)	(0.027)	(0.859)
Residence in Floodplain	0.241***	0.166***	2.287***	0.0389***
	(0.000)	(0.000)	(0.000)	(0.000)
Time in Residence	-0.0521*	-0.007	-0.132	-0.00956*
	(0.097)	(0.696)	(0.379)	(0.087)
Income	-0.002	0.009	0.078	0.00401*
	(0.877)	(0.261)	(0.216)	(0.089)
Female	0.051	0.001	0.256	0.0194**
	(0.241)	(0.962)	(0.220)	(0.012)
Age	0.0931***	-0.008	-0.052	-0.001
	(0.000)	(0.402)	(0.526)	(0.753)
Highest Education	-0.0326**	-0.005	0.162**	0.003
	(0.035)	(0.624)	(0.029)	(0.312)
Constant	2.107***	2.112***	8.703***	0.142***
	(0.000)	(0.000)	(0.000)	(0.000)

Note: p-values in parentheses (* p<.1, ** p<.05, *** p<.01)

6.2 Main Findings: Female Effect

In the analysis of the new findings from the existing dataset, all narrative language treatments were compared with the base message, and not aligned with the science message as it was in the original study. Base message is conceptualized as the control group and is structured solely as a rational definition of flooding, and does not include any element of narrative persuasion. By firstly observing the female treatment, we gather some very interesting and insightful findings, presented mostly in detail in table 2. The analysis focuses on the relationship between female exposure to different narrative messaging (science narrative messaging, hero narrative messaging, victim narrative messaging, and victim-to-hero narrative messaging) and the pro-environmental outcome variables (positive affective response, negative affective response, personal risk perception, and intended risk mitigation behaviors

Table 3. *Female Effect Analysis*

Variables	Positive Affective Response	Negative Affective Response	Personal Risk Perception	Intended Risk Mitigation Behaviors
Science Narrative	-0.0784	-0.0504	-0.147	-0.0181
	(0.464)	(0.45)	(0.785)	(0.334)
Hero Narrative	0.178	-0.054	-0.725	-0.021
	(0.102)	(0.426)	(0.154)	(0.258)
Victim Narrative	0.0264	-0.061	-0.66	-0.00896
	(0.808)	(0.339)	(0.2)	(0.626)
Victim-to-Hero Narrative	0.182*	0.0472	-0.454	-0.0256
	(0.093)	(0.496)	(0.385)	(0.157)
1.female	-0.144	-0.11	-0.103	0.033
	(0.287)	(0.159)	(0.88)	(0.186)
Female exposed to Science Narrative	0.11	0.0978	0.704	-0.0206
	(0.489)	(0.296)	(0.392)	(0.483)
Female exposed Hero Narrative	0.317*	0.115	0.992	-0.0173
	(0.051)	(0.225)	(0.209)	(0.563)
Female exposed to Victim Narrative	0.162	0.265***	-0.0107	-0.0101
	(0.318)	(0.006)	(0.99)	(0.736)
Female exposed to Victim-to-Hero Narrative	0.279*	0.0269	0.0601	-0.0131
	(0.09)	(0.777)	(0.939)	(0.657)
Perceived Self-Efficacy	-0.0741***	-0.226***	-1.858***	-0.0249***
	(0.006)	(0)	(0)	(0)
Undertaken Behaviors	1.195***	0.297*	1.868	0.239***
	(0)	(0.063)	(0.104)	(0)
Property Elevation	-0.000991	-0.00184**	-0.0784***	-0.000585**

|				
	(0.492)	(0.011)	(0)	(0.026)
Flood Experience	0.129**	0.147***	0.587**	-0.00158
	(0.021)	(0)	(0.033)	(0.868)
Residence in Floodplain	0.239***	0.162***	2.204***	0.0388***
	(0)	(0)	(0)	(0)
Time in Residence	-0.052	-0.00832	-0.148	-0.00961*
	(0.107)	(0.659)	(0.331)	(0.077)
Income	-0.00249	0.00878	0.128**	0.00402*
	(0.855)	(0.238)	(0.025)	(0.088)
Age	0.0936***	-0.00789	-0.0518	-0.000947
	(0)	(0.479)	(0.536)	(0.75)
Highest Education	-0.0329**	-0.00609		0.00272
	(0.033)	(0.493)		(0.335)
Positive Affective Response			0.315***	0.0439***
			(0.005)	(0)
Negative Affective Response			2.440***	0.00291
			(0)	(0.725)
Personal Risk Perception				0.00595***
				(0)
Constant	2.216***	2.173***	9.222***	0.163***
	(0)	(0)	(0)	(0)
N	1938	1938	1938	1938
R^2	0.087	0.169	0.38	0.216

Note: p-values in parentheses (p<.1, ** p<.05, *** p<.01)*

Starting with female treatment exposed to the message containing scientific elements of narrative persuasion, the coefficient estimate is 0.11, but it is not statistically significant, (p-value=0.489), suggesting that there is no significant relationship between exposure to science narrative and positive affective response among female participants. Same findings are observed also in the negative affective response study variable (coefficient=0.0978; p-value=0.296.) as well as personal risk perception (coefficient=0.704; p-value=0.392), not statistically significant at the chosen significance level, which indicate no effect of narrative elements inclusion on these two study variables in female participants, Lastly, the coefficient estimate for the variable in question is negative as it pertains to the outcome of intended risk mitigation behaviors, calculated as (-0.0206) and having a p-value higher than the significance level, indicating that there is also no statistically conclusive relationship between female exposed to science narratives and intended risk mitigation behaviors.

Secondly, females exposed to hero narrative provide the first meaningful and valuable finding that is diverse from the finding of the original study. In the original study, there is no significant association between the treatment female (both female=0 and female=1) and positive affective response, but the new finding provides a different scenario. Considering the coefficient estimate (0.317) as well as the p-value (0.051), clear indications that there is a positive and slightly statistically conclusive association between exposure of female (female=1) to the hero narrative and positive affective response. Even though the association between the variables is not statistically significant at the conventional alpha level of 0.05, falling just short of that conventional threshold, it is considerably significant at the threshold of 0.1, which still implies a suggestive relationship that is worth further investigation.

The three other outcome variables are on the same path of findings as the science narrative messaging, with all of them not representing a significant association with the female participants exposed to the hero narrative, while only the intended risk mitigation behaviors have a negative coefficient estimate, a trend observed in the first analysis. The visual representation presented in Figure 14, allows us to gain insight into the impact of narrative treatments on the conviction of female participants, specifically regarding positive affective response. The visualization of predicted outcomes for female participants (with 95% confidence interval) enables a clearer observation and analysis of the data, and it provides further evidence on how different narrative treatments influence female opinion and conviction.

*Figure 14. Female & Positive Affective Response (95% CI)*
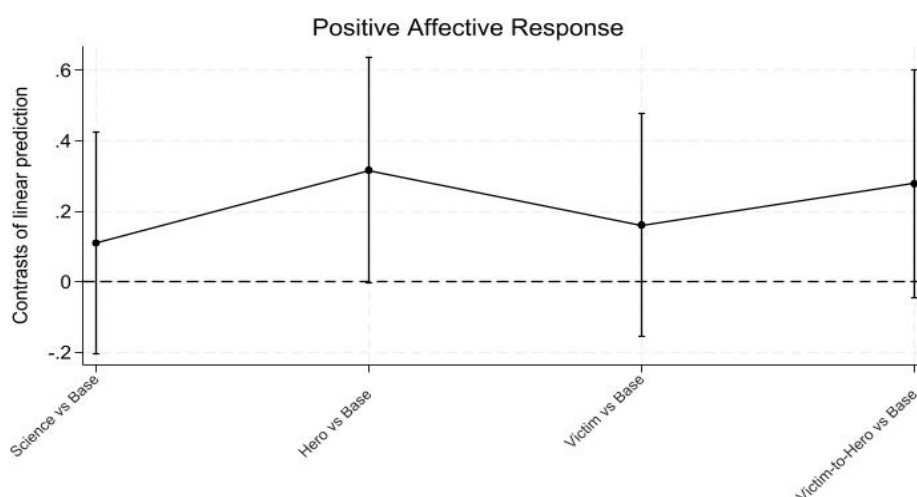
Result 1: There exists a positive and marginally significant relationship between female exposed to hero narrative and positive affective response.

Female participants exposed to the victim narrative provide the main finding of this section, as they suggest that there is compelling evidence between the association between female participants exposed with the victim messaging and negative affective response. Importantly, this effect is not only sizable but also highly significant, with a p-value of less than 0.001, the highest observed p-value so far. This robust statistical significance lends strong support to the finding that there is a significant and meaningful relationship between providing female participants narratives containing victim messaging about environmental hazards and an increase in negative affective response. This finding was not observed in the original study, as there was no evidence that the covariate female had a significant relationship with the negative affective response outcome, nor did the victim messaging, which did not yield any significant effects in the previous analysis.

Figure 15 is a visual representation that sheds light on the influence of the victim narrative on the conviction of female participants, particularly concerning negative affective responses, offering compelling evidence for this pro-environmentally outcome variable as well as further enhancing the understanding of the victim narrative messaging dynamics on female participants. To be noted is the fact that this effect is mediated, exerting an indirect influence on the outcome of the study variables. Considering this interplay and interconnectedness between variables reveals an underlying pathway through which the effects are transmitted.

Figure 15. Female & Negative Affective Response (95% CI)
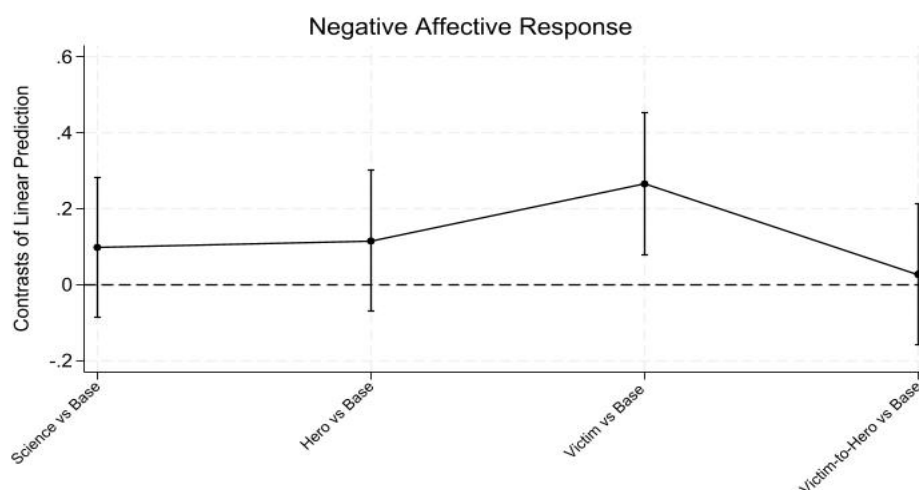
Result 2: There exists a substantial and meaningful relationship between female exposed to victim narratives and negative affective response

Subsequently, female participants exposed to the victim narrative exhibited the following patterns. The coefficient estimate for exposure to the victim narrative is slightly positive (0.162) in association to positive affective response, slightly negative (-0.0107) in regards to personal risk perception, as well as a negligible negative effect (-0.0101) as it pertains to intended risk mitigation behaviors. Based on the careful analysis, it can be concluded that all of the aforementioned effects concerning these three pro-environmental outcomes lack statistical significance, and the observed relationship between the variables under scrutiny and their impact on the outcomes are not considered statistically meaningful or reliable. Moreover, this implies that the utilization of victim narratives is deemed ineffective or lacking in significance when it comes to the mentioned study variables, and employing narratives that focus on victimhood fail to produce substantial and meaningful impacts on pro-environmental outcomes, and alternative approaches should be explored.

Figure 16. Female & Personal Risk Perception (95% CI)
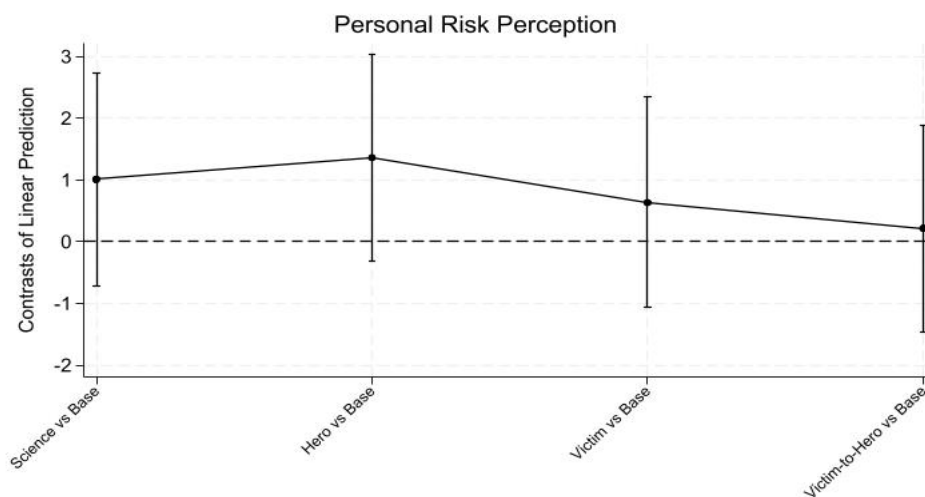
The last observation, refers to the relationship between female exposed to victim-to-her narrative and its impact on the four pro-environmentally outcomes. By analyzing the coefficient estimate and the p-value investigation among female participants exposed to the victim-to-hero narrative, none of the pro-environmentally outcomes derive and reach conventional levels of statistical significance. The only inclusion that might be suggested is that there is a potential association between exposure to the victim-to-hero narrative and an increase in positive affective response, since its p-value is significant at the 0.1 alpha level. Coefficient estimate follows the same pattern of positive but yet not possessing significant relationship for all of the outcome variable except for the estimate of the intended risk mitigation behaviors, which indicates a slightly negative but still

not statistically conclusive relationship (-0.0131). This results come as a paradox compared with the original findings regarding the general approach of the female treatment and its impact with the intended risk mitigation behavior, that implied a notable association between these two variables. This could be potentially influenced by the unexamined covariate participants in my study.

Figure 17. Female & Intended Risk Mitigation Behavior (95% CI)
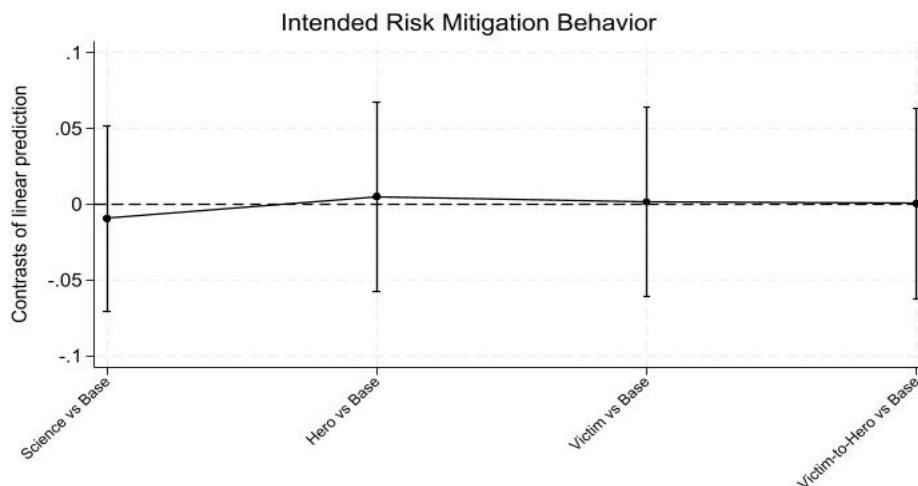
6.3 Main Findings: Age Effect

This next section will study the interdependence between age effects and study variable outcomes, aiming to understand the patterns and trends of age groups in relation to their narrative exposure and how it translates into the desired pro-environmental outcomes. By examining the data across different age categories, valuable insights can be uncovered into the role of age in shaping individuals' attitudes and behaviors towards fostering pro-environmentally awareness and risk mitigation. Table 4 represents the results of a linear regression analysis, with a specific emphasis on the interaction between age treatment conditions and the four pro-environmental outcome variables.

Table 4. *Age Effect Analysis*

Variable	Positive Affective Response	Negative Affective Response	Personal Risk Perception	Intended Risk Mitigation Behavior
Science Narrative	-0.511*	-0.372**	0.979	-0.124***
	(0.056)	(0.022)	(0.538)	(0.007)
Hero Narrative	0.0688	-0.219	0.177	-0.0678
	(0.796)	(0.206)	(0.906)	(0.128)
Victim Narrative	-0.213	-0.099	-0.505	-0.0880**
	(0.418)	(0.551)	(0.736)	(0.044)
Victim-to-Hero Narrative	0.168	-0.0996	0.489	-0.102**
	(0.53)	(0.547)	(0.746)	(0.023)
Age	0.0362	-0.0512*	0.0429	-0.0121
	(0.47)	(0.081)	(0.875)	(0.124)
1.treat#~e	0.110*	0.0826**	-0.184	0.0216**
	(0.057)	(0.018)	(0.576)	(0.03)
2.treat#~e	0.0565	0.0492	-0.0819	0.0115
	(0.331)	(0.183)	(0.792)	(0.23)
3.treat#~e	0.0713	0.034	0.00592	0.0170*
	(0.207)	(0.333)	(0.985)	(0.069)
4.treat#~e	0.0311	0.0363	-0.146	0.0187*
	(0.593)	(0.297)	(0.639)	(0.055)
1.female	0.0512	0.00105	0.276	0.0236***
	(0.252)	(0.968)	(0.22)	(0.005)
Perceived Self-Efficacy	-0.0769***	-0.228***	-2.440***	-0.0437***
	(0.004)	(0)	(0)	(0)
Undertaken Behaviors	1.216***	0.317**	2.997**	0.312***
	(0)	(0.047)	(0.016)	(0)
Property Elevation	-0.000988	-0.00176**	-0.0828***	-0.00113***
	(0.495)	(0.016)	(0)	(0)
Flood Experience	0.127**	0.142***	0.961***	0.0099
	(0.022)	(0)	(0.001)	(0.317)
Residence in Floodplain	0.241***	0.164***	2.781***	0.0658***
	(0)	(0)	(0)	(0)
Time in Residence	-0.0542*	-0.00849	-0.167	-0.0127**
	(0.092)	(0.655)	(0.318)	(0.03)
Income	-0.00196	0.00931	0.0963	0.00469*
	(0.885)	(0.21)	(0.129)	(0.059)
Highest Education	-0.0329**	-0.00464	0.141*	0.00201
	(0.032)	(0.603)	(0.067)	(0.494)
_cons	2.396***	2.313***	14.00***	0.422***
	(0)	(0)	(0)	(0)
N	1938	1938	1938	1938
R-²	0.087	0.166	0.311	0.136

*Note: p-values in parentheses (* p<.1, ** p<.05, *** p<.01)*

To begin, I will delve into the variation among age cohorts concerning the positive affective response outcome. For a better comprehension, the contrast of linear prediction was utilized (at 95% confidence interval), with the findings visually presented in Figure 18. The findings highlight that older age groups, specifically age group 7 (highest positive contrast) and age group 6, have higher coefficient value than younger audiences (1,2,3,4), when they are exposed to a scientific narrative messaging regarding this environmental hazard. However, to be noted is the fact that none of the age categories interaction with science versus base narrative messaging has a significant association with the "positive affective response" outcome, since their p-value does not meet the predetermined significance level of 0.05.

In relation to the second interaction, what is particularly noteworthy is the significant and positive correlation observed between the interaction of age groups (3 through 7) and the hero narrative, in relation to the outcome of positive affective response, which aligns with the desired outcome of fostering pro-environmental attitudes and behaviors. While all age groups exhibit favorable responses, older participants, demonstrate a more pronounced inclination towards positive affective reactions to the hero messaging compared to the base messaging, suggesting for targeted communication strategies that address the varying needs and experiences of different age cohorts.

Result 3: There exists a significant and positive correlation between the interaction of older age groups and the hero narrative related to the "positive affective response" study variable.

Figure 18. Narrative & Age Groups Influence on Positive Affective Response (95% CI)
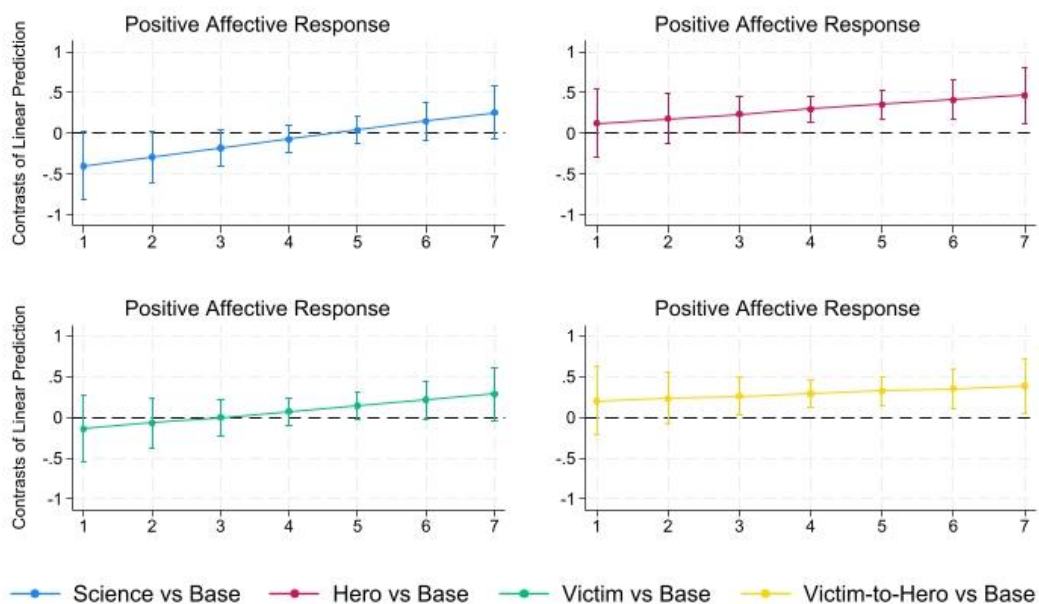
The interaction between the victim-to-hero narrative and age groups (3 to 7) reveals a consistent pattern, wherein all of these age groups exhibit a positive and statistically significant relationship with the observed study outcome. These intriguing findings shed light on the effectiveness of this narrative in generating positive awareness and support for pro-environmental outcomes. The data suggest that individuals who are more senior in age are particularly receptive to the transformation of a victim-to-hero narrative, leading to a greater likelihood of positive engagement and response, while the same outcome is not observed among younger audiences.

Result 4: Older age groups exposed with the victim-to-hero narrative consistently show a positive and significant relationship with "positive affective response", while younger audiences do not demonstrate the same pattern

Lastly, in regards to the victim narrative observation, similar to the science narrative, it is important to note that the relationship between age groups and positive affective response does not reach statistical significance at the 95% confidence level. This implies that this interaction lacks statistical support, and the effectiveness of the victim narrative in eliciting the desired outcome of positive affective response (which also has an indirect influence on personal risk perception and intended risk mitigation behavior), within different age groups remains inconclusive based on the available data.

Now the attention shifts to the second study variable outcome, namely the "negative affective response", investigating the interaction between narrative messaging across age groups and this particular outcome. The findings suggest that the science narrative has a negative significant influence on promoting negative affective response among younger individuals (age group 1 and 2) compared to the base group. As participants grow older, the negative impact of science narrative on this study variable diminishes, as senior participants observed a slightly positive but not statistically conclusive association with the "negative affective response" at the 95% confidence interval. This indicates that the science narrative compared to the base narrative, may not have a substantial negative influence on these age groups, although the relationship does not reach statistical significance at the 95% confidence interval.

Result 5: The science narrative exhibits a significant negative influence on promoting "negative affective response" outcome among younger participants when compared to the base group.
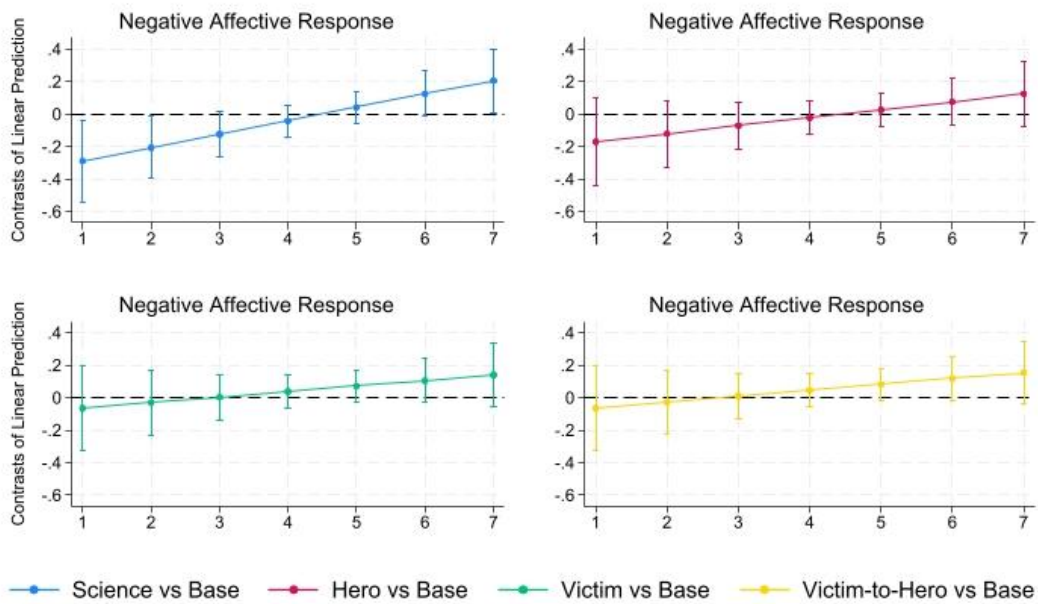
The analysis of the hero narrative compared base group, victim narrative compared to the base group, and victim-to-hero narrative compared to the base group showcase a gradual shift in susceptibility. As participants age increases, there is a progressive shift in the influence of these narratives, transitioning from negative contrasts to positive contrasts. Recurrently, these interactions, despite demonstrating intriguing patterns, do not consistently achieve statistical significance across all age groups examined in relation to the study outcome. The absence of statistical significance implies that the findings lack generalizability to all age groups.

As it pertains to the "personal risk perception" outcome, in terms of the science narrative interaction, there is no statistically significant relationship observed across all age groups. The confidence intervals for the contrasts between age groups 1 to 7 (compared to the base narrative) are relatively wide, suggesting a lack of precision in the estimates. This implies that the science narrative does not influence personal risk perception across different age groups.

Comparing the hero narrative to the base narrative, a similar pattern emerges, not showing any consistent impact on personal risk perception across all age groups. The confidence intervals for all age groups include zero, indicating that this narrative influence does not reach statistically conclusive levels at the 95% confidence interval. For the victim narrative compared to the base narrative as well as the victim-to-hero narrative, similar to the two previous treatments, no statistically significant impact on this pro-environmental outcome is observed for any age groups.
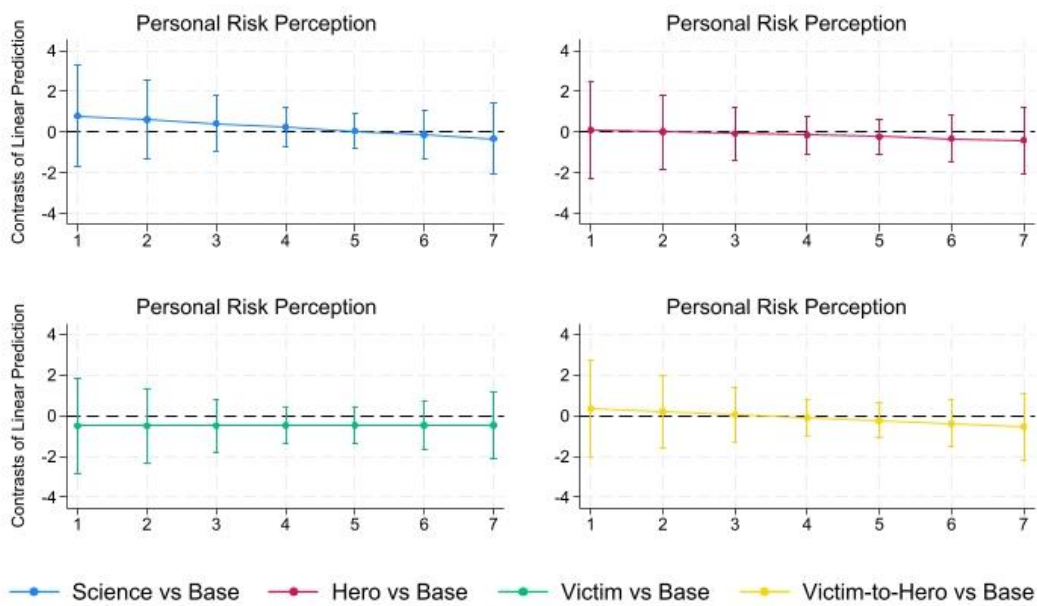
Lastly, Figure 21 provides a visual representation of the impact of narrative messaging and age groups interaction on the "intended risk mitigation behavior" outcome. This outcome is the ultimate embellishment of the analysis, and implies great significance to the research objective, as it involves taking concrete actions to actively contribute to positive environmental and societal changes, and is a crucial measure of attitude and behavior change towards these desired outcomes.

Based on the findings, it can be observed that as age increases, the likelihood of engaging in intended risk mitigation behavior increases across all narratives compared to the base group. The importance of this trend becomes even more noteworthy as it is observed consistently across the first two study variable outcomes (positive affective response & negative affective response).

The most important insight derived from the interaction of narrative message and age groups pertaining to this study variable are as follows: statistically significant negative relationship across age groups 1 through 4 for the comparison between science narrative and base group; statistically significant negative relationship across age groups 1 through 2 for the comparison between victim narrative and base group; statistically significant negative relationship across age groups 1 through 3 for the comparison between victim-to-hero narrative and base group.

Result 6: A statistically significant relationship is observed across younger individuals for the correlation between the science narrative and the base group, with reference to the "intended risk mitigation behavior" outcome.

Figure 21. Narrative & Age Groups Influence on Intended Risk Mitigation Behavior (95% CI)
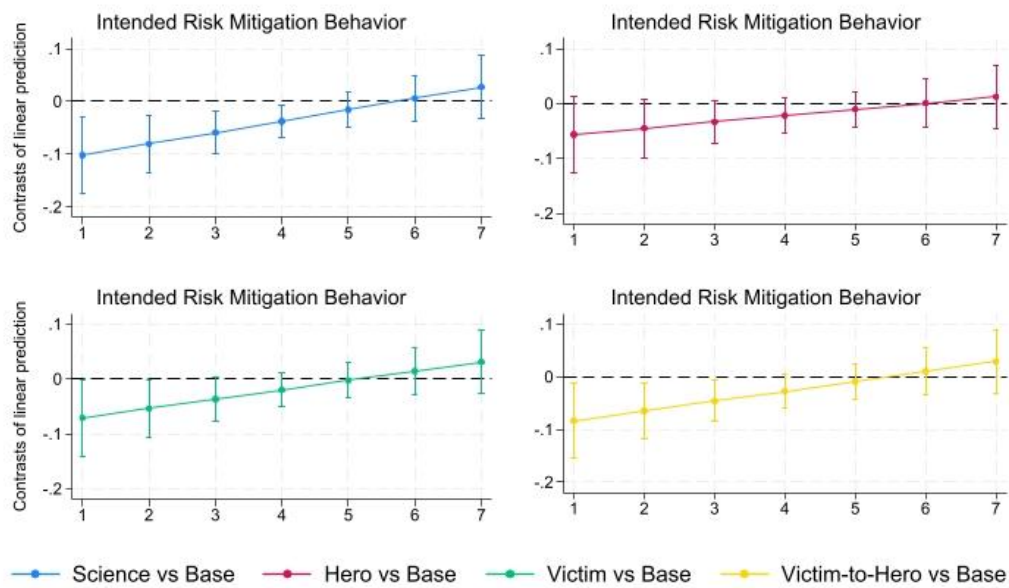
Result 7: There exists a significant and adverse association between the victim narrative and the base group among younger audience regarding the outcome of "intended risk mitigation behavior"

The confidence intervals for each of these age groups does not include zero, strengthening the significance of this negative relationship, and further providing context on the disparity between younger and older audience when it comes to this study variable outcomes. This observation highlights the robustness of the findings, and adds weight to the argument that there is indeed a notable disparity between the younger and older audience in relation this study outcome, further emphasizing the need to pay close attention to the influence of age on the intended risk mitigation behavior.

Result 8: Younger individuals are less likely to engage in "intended risk mitigation behavior outcome" when they are exposed to a victim-to-hero narrative compared to a base narrative.

Chapter 7: Discussion

7.1 Conclusion

The conclusion chapter of my research study marks the culmination of the observation and analysis that sought to unravel the correlation between narrative messaging and its influence on female participants in terms of influencing desired pro-environmental outcomes. Additionally, this study delved into examining the effects of the four narrative messaging across different age groups, and how this interaction influenced the four key pro-environmental study variable outcomes. The purpose of this study was to shed light and thoroughly contribute on the complex and dynamic relationship between narrative persuasion through various narrative messaging and storytelling elements, and pro-environmental behavior, aiming to provide valuable insight into the effectiveness of narrative interventions in fostering awareness regarding sustainable attitudes and actions. In this chapter, I will provide a summary of the key findings, as well as discuss certain implication, and propose avenues for future research in this captivating field.

Beginning with the effect of narrative messaging female participant's engagement and influence on the four pro-environmental outcomes, one key finding emerges from the analysis of the dataset. Result 2 highlights the significant and meaningful relationship between female participants exposed to the victim narrative and negative affective response. This finding stands out the most due to the fact that it was not observed in the original study, and provides robust evidence that narratives containing victim messaging about environmental hazards significantly increase negative affective response among female participants. This result underscores the importance of narrative framing and messaging strategies, as well as potential emotional resonance that victim narratives can evoke in female audiences.

The identification of this relationship adds a novel dimension to the understanding of narrative persuasion and its distinct effect on pro-environmental outcomes for female participants, and can furtherly assists policy makers and decision-making bodies in this field. Tailoring narrative interventions that include "victim" messaging as the focal point of content and context of pro-environmental communication campaigns, may be an effective approach. Through eliciting negative affective responses, this approach can serve as a catalyst for driving pro-environmental behavior change among women.

Moreover, this finding emphasizes the need for further exploration and consideration of gender-specific responses to narrative messaging in environmental communication efforts. By

acknowledging and addressing gender-specific responses to narrative messaging, policy makers can foster more impactful connections with the target audience, leading to greater empowerment, collective actions, and progress toward sustainability goals.

Furthermore, the analysis of the data reveals significant and impactful correlations between age groups and the impact of narrative messaging on pro-environmental outcomes. Collectively, the results indicate that the older age groups exhibit a more positive and receptive response to narrative messaging. Result 3 and Result 4 demonstrate a significant and positive relationship between older age groups and both the hero narrative and victim-to-hero narrative, suggesting that older individuals are more likely to be influenced by these specific narratives, leading to a stronger positive emotional reaction.

On the other hand, younger audiences do not demonstrate the same pattern of response. Results 5 and Result 6 reveal that the science narrative, compared to the base messaging, has a significant negative influence on promoting intended risk mitigation behavior as well as negative affective response among younger individuals. This indicates that science narrative might not be the most suitable and adequate communication approach for younger individuals in fostering awareness and encouraging impactful actions toward desired pro-environmental goals. Additionally, result 7 provides further evidence around this same notion, showing an adverse association between the victim narrative, victim-to-hero narrative and intended risk mitigation behavior among younger audiences, indicating a potential deterrent effect on their willingness to take action and change behavior.

These findings collectively underscore once again the importance of tailoring narrative messaging to different age groups. To accomplish the desired pro-environmental outcomes and drive meaningful behavioral change, it is imperative to prioritize the development and adoption of targeted communication strategies accordingly that consider the specific responses and needs of different age groups. For younger individuals, alternative narratives that emphasize the positive aspects of environmental actions should be explored, and it is crucial to acknowledge and counteract the negative detrimental effect of the science narrative messaging and alleviate its impact on younger individuals as it pertains to the pro-environmental outcomes.

Alternatively, for older audiences, the hero and victim-to hero narrative proves to be effective, and policy makers should strategically leverage these narrative to foster positive affective responses and encourage pro-environmental attitudes and behaviors. This can involve incorporating heroic figures and success stories into environmental campaigns to inspire and motivate older individuals to take positive actions towards the environment and society.

7.2 Limitations

While this dissertation contributes valuable insights into the relationship between narrative persuasion and pro-environmental behavior, it is important to acknowledge that certain limitations arise. These limitations are observed not as a threat, but rather as an opportunity to refine and expand our knowledge in the field of narrative persuasion and its broad spectrum of influence. They should be taken into consideration when interpreting the findings, and should guide future research endeavors in this captivating field.

Firstly, the study was conducted in a controlled experimental setting, which in hindsight may not completely capture the complexities of real-world narrative interventions and their impact on pro-environmental outcomes. The nature and context of this experimental design may limit the ecological validity of the findings, and future research should investigate the effectiveness of this relationship in a more naturalistic setting, to provide further evidence and understanding of their real-world application. In addition, on the same line of reasoning, this experimental research is in high risk of experiencing human error, as participants can be influenced by their extraneous variables, such as current situation or time of day of testing.

Subsequently, the study specifically examines the effect of four narrative messaging approaches on pro-environmental outcomes. While these narratives were carefully selected and implemented from the original study design, they narrow the focus and restrict the scope of the study. Future research should consider a wider range of narrative messaging and contextual approaches to broaden the understanding of their influence. By exploring diverse narrative techniques, such as personal stories, social and cultural narratives, etc., a more comprehensive understanding of how different types of narratives influence pro-environmental outcomes will be achieved. Lastly, the medium of communication in which narratives are presented is another valuable indicator that should be taken into consideration.

Lastly, long-term effects of the responses should also be considered a potential limitation. While the immediate impact of narrative intervention on pro-environmental awareness and risk cognition is examined, it is important to consider the durability of the observed effects and whether they translate into lasting behavior change over time. Understanding the longevity of the effects is crucial for assessing the true effectiveness of narrative persuasion in fostering long-term pro-environmental outcomes.

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