

Stories of Reason and Emotion - A Study on the Reputation of Social Ventures

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Abstract

Social enterprises are businesses with specific types of needs and capacities. In order to adjust their reputation and perceived success, they rely on narratives and subsequent storytelling techniques. This study looks at the way ration and emotion impact and affect human perception, as well as how the presence of quantitative and emotive language predict the success of social entrepreneurial stories. Results show that emotion is an important and statistically significant driver in reputation perception. The analysis shows that rationality is also beneficial, but the presence of quantitative language does not have significant contributions.

Statement Of Originality

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I declare that the text and the work presented in this document are original and that no sources other than those mentioned in the text and its references have been used in creating it.

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“We rise by lifting others.”

—Robert G. Ingersoll

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1 Introduction

The essence of social entrepreneurship is captured in the idea that social and economic value can coexist for the benefit of humanity, solved through the pursuit of neglected social issues with positive externalities [Santos, 2012]. In contrast to traditional entrepreneurs, who start ventures with the purpose of creating profit, social entrepreneurs find ways to create social value through market means. Social businesses come in a wide array of legal form, with varying purposes, but the overarching goal is that of creating social value with sufficient economic profit to support all operations [Krueger, 2017]. Several notable companies are of a social nature, such as Tony’s Chocolonely, Ashoka, Community Shop, Water Health International, Kiva and Start Some Good, to name a few. The fact that these social ventures exist and they are successful validates the perception that society, in general, agrees with the necessity of such business actors and validates their perceived contribution to the business environment [Haugh, 2007]. Nevertheless, it is sometimes difficult to see whether a company has a real, quantifiable impact or is simply better at marketing or branding. While it is relatively easy to assess the strength of a well-established for-profit company, social ventures bring an additional dimension of analysis through the social impact they provide, which is difficult to forecast, quantify and analyse. As such, social entrepreneurs find themselves in the position where they have to express their message through stories that appeal to consumers and convey their social impact through methods of storytelling.

In the words of Joe Lazauskas and Shane Snow from The Storytelling Edge, “Good stories surprise us. They make us think and feel. They stick in our minds and help us remember ideas and concepts in a way that a PowerPoint crammed with bar graphs never can.” [Snow et al., 2018]. The previous quote is, thus, conveying of the potential hierarchy of perception between objective results, as quantified in the social impact, and the story that the company says. As such, this leads to the questions that this thesis will attempt to answer: what are the main drivers of storytelling on the reputation of social businesses? Is emotion more important and should all narratives express intensely emotive language?

Are metrics the only valuable component in a business story and should companies only use quantitative language? Moreover, do sexes view stories differently?

Storytelling is an important part of any incipient business and is integral to the marketing and branding efforts of entrepreneurial ventures [Pulizzi, 2012]. Social entrepreneurs must also present a compelling story to support their moral claims and further their goals. The difficulty in assessing the value of enterprises comes from the fact that the perception of social value is affected by both the story and the concrete impacts of the company. The latter is remarkably difficult to assess and there are too few agreed quantifiers for it, which may affect the way social ventures are priced, the financial instruments they have access to and generally how they interact with the financial world [Pynadath and Thomas, 2021] [LEE, 2019] [Scarlata and Alemany, 2010]. Having such metrics would be a step forward in correctly estimating the impact social entrepreneurs have, as metrics are an objective way to determine contribution, profitability and other aspects of business, as well as observations on trends and performance [Klubeck, 2012]. Without such instruments of observation, social entrepreneurs are faced with the decision regarding how much should they rely on and invest into their storytelling, as well as how they should phrase it.

The means to finding the solution to the aforementioned problem is to segment the contribution of the various elements from the story. In particular, the analysis will focus on the weight allocated to the emotional content and intensity, expressed through emotive language, in relation to quantitative language, comprising of the presentation of measurable social impact and quantifiable indicators. This thesis has the goal of showing how storytelling affects the perception of social businesses and the reputation of such ventures. By obtaining an answer to this question, it will be known if the people analyse the objective results of social businesses, how they perceive them, how aware they are of these topics. Following this, the results offer an insight into the optimal intensity of emotional content and emotive language in storytelling, as well as the hierarchy of perception between reason and emotion. Moreover, this thesis should give an insight into the way different sexes view emotions differently, as

well as an analysis into other variables that may have an effect, such as age.

The means to answer this question is through an online experiment addressed to a wide array of people. The experiment aims to segment the story into components. As such, people receive a questionnaire where they are being asked to rate the perceived reputation of the respective company. The experiment manipulates for emotional content, as expressed through emotive language, where one of the questionnaires has stories with highly emotive language, and the other has a rigid type of expression. Within each questionnaire, there are presentations of companies that either have communicated objective results and metrics through quantitative language or have expressed generalities and vague goals.

2 Literature Review

2.1 Social Enterprises

In order to discuss about social businesses, one must first give a definition of it. The most popular one states that a social business is a type of business that maintains a balance between social and financial purposes, falling halfway between profit-maximising and non-profit sectors [Battilana and Lee, 2014]. This is the definition with the most academic consensus and the one that is going to be used throughout this study. An alternative definition is the one offered by the Nobel Peace Prize laureate Muhammad Yunus. According to Yunus, a social business is a company with a social mission at its core [Yunus, 2009]. Created to solve a specific problem to the benefit of disadvantaged or poor members of society, social businesses operate just like normal companies, but with some restrictions related to dividends. Later on, in 2015, Yunus came up with a more narrow definition, defining social business as a kind of business whose primary aim is to address a social problem, which is financially self-sufficient and which does not pay dividends to its owners [Yunus et al., 2015]. The common denominator of these definitions is the dual aspect of social and economic dimension and the pursuit of solving social issues. Social ventures are characterised by their focus on identifying social problems and solving them through utilising business methods. It can be observed that a social enterprise, unlike a charity, makes a profit and strives to be financially self-sustaining. By eliminating the need for fundraising, ethical firms may reinvest revenues towards creating long-term social impact.

Sole proprietorships, for-profit businesses, nonprofit organisations, non-governmental organisations, youth groups, community organisations, and other structures can all be considered social ventures. Government entities are not often thought of as social ventures, although they can embrace entrepreneurial approaches, potentially working with independent groups, to investigate new ways of providing social services. For social ventures, Elkington and Hartigan identify three models: leveraged nonprofit, hybrid nonprofit, and social busi-

ness [Elkington and Hartigan, 2008]. Non-governmental organisations are legal entities that are established and run for a collective, public, or social benefit, as opposed to businesses that strive to make a profit for their owners. The non-distribution constraint applies to nonprofits: any surplus funds must be invested in the organisation’s mission rather than distributed to private parties. Examples of nonprofit organisations could be of several types, such as political groups, schools, business associations, churches, social clubs, and consumer cooperatives. Nonprofit organisations can seek government approval to be tax-exempt, and some may be eligible to accept tax-deductible contributions, but they can also establish as a nonprofit organisation without obtaining tax-exempt status.

Combining a market approach with a social goal is an aspect that needs to be managed and integrated. Hybrid organisational models, like hybrid species in nature, may be a source of innovation. They do, however, confront unique challenges that might prevent them from prospering. When organisations mix social mission with economic activity, they produce unusual combinations of activities for which there may not yet be a conducive environment [Hynes, 2009]. In this context, companies find themselves striving to meet the social expectations and goals it has, while also being profitable, which leads to an issue of the ”double bottom problem” [Dart et al., 2010]. Mission drift is a crucial aspect of social businesses, defined as a socio-cognitive construct that is recognised by the perception of inconsistent action of an organisation and its stated mission [Grimes et al., 2019]. To prevent mission drift or a concentration on profits at the expense of the social good, hybrids must achieve a careful balance between social and economic goals [Battiliana et al., 2012]. Despite the evidence of societal benefit, research reveals that hybrids are fragile organisations that face internal conflicts and mission drift as a result of conflicting agendas, and that they may struggle to attain financial viability [Battilana and Dorado, 2010]. Mission drift occurs when a socially oriented entity accepts funding in exchange for operating programs that are outside the its original mission. When a social business’s mission shifts, it’s called mission drift [Man, 2013]. A further description of the segmentation of hybrid ventures is found in Subsection 8.1 of

the Appendix.

Social ventures are already an established concept, currently solidifying its integration in the international financial context. Since 2000, the number of social ventures has significantly increased, both in developing and developed countries [Bornstein and Davis, 2010]. In 2009, an estimated 4% of the US adult population was employed in social businesses, meaning almost 6 million people [Bosma et al., 2010]. In comparison, traditional for-profit entrepreneurial companies employed only double this amount. This shows just how much the world values the necessity for such businesses and the wide array of industries it can activate it. Around 30% of the US business activity is centred around social ventures, number similar to other developed countries [Leahy and Villeneuve-Smith, 2009]. One added benefit of social entrepreneurial companies, in relation to traditional entrepreneurial ventures, is the potential access to more types of funding and support. There is no formal barrier to the way social businesses can attract funding from standard market sources, such as banking and venture capital, even if the lack of dividends might seem unappealing to some. On the other hand, social ventures have access to a wide array of other sources, which might prove vital in the early start of the company, such as charities, fellowship organisations, private philanthropists and philanthropic foundations, volunteers and other investors focused on social impact [Nicholls, 2010].

2.2 Social Impact and Reputation

Drivers of entrepreneurial success can be varied and often are not intuitive. In the particular case of social entrepreneurship, it was observed that the branding transition from the 'social' focus to the 'entrepreneurial' focus was beneficial. It was shown that the implementation of entrepreneurial jargon to the branding of nonprofit businesses resulted in an increased perception of their success, with significant benefits on reputation and legitimacy [Andersson and Self, 2015]. When analysing the success factors of social entrepreneurship, with a particular focus on the country indicators, it is concluded that entrepreneurial ten-

dencies increase the size and success of the social entrepreneurial system [Roy et al., 2014]. By this it is meant that owners who focus on having a business mindset and use standard industry marketing practices have a better chance of being perceived as successful.

An important aspect of the current research is the quantification of the success of a social business. Business literature abounds with indicators of performance when performing a financial analysis for an established company [Friedlob and Schleifer, 2003] [Peterson and Fabozzi, 1999]. The wide array of metrics to analyse the performance of a business is mostly focused on companies that are stock traded and have a long history of existence. First of all, the difficulty of observing the position of the company increases when considering emerging businesses. Secondly, having a company with a social dimension requires additional metrics related to the social impact, as well as for the harmonious co-integration of the social and economic dimensions. The additional aspect of social value requires completely new methods of quantifying success [Rawhouser et al., 2019]. Kroeger and Weber have created a conceptual model that analyses the dimensions of subjective well-being, global life satisfaction and domain satisfaction in order to have a metric for social value created [Kroeger and Weber, 2014]. Such criteria of success must comprise of the entrepreneurial success in terms of economical value, the social impact with regards to social value creation, as well as the consistency and balance between the two, such as to not lead to mission drift [Antadze and Westley, 2012].

Reputation is regarded as a critical aspect of branding and identity for all companies, being a way through which firms show their central and distinctive identity [Whetten and Mackey, 2002]. It essentially is the external assessment of the company by external stakeholders. The positive reputation is defined as the perception of the stakeholders about a company's capacity to create value relative to its competitors [Ravasi et al., 2018]. Several dimensions are included under the umbrella term of reputation, those being: an organization's perceived capacity to meet those stakeholders' expectations, the rational attachments that a stakeholder forms with an organization, and the overall "net image" that

stakeholders have of the organization [Waddock, 2000]. Attempts were even made to directly quantify the value of reputation by linking it to the stock price of the company. Such metrics are still developing for ongoing companies, with one clear use being the estimation of the goodwill amount in case of mergers and acquisitions [Fombrun, 2005]. In his research, Fombrun identifies six dimensions of reputation: financial performance, workplace environment, products and services, emotional appeal, social responsibility, vision and leadership [Fombrun et al., 2004]. It is clear that this framework is also adequate for this study, as financial performance links to rationality and is the core of the quantitative language in stories, and emotional appeal links to the general concept of emotion and the emotive language used to express them.

For social entrepreneurs, reputation is a tool for survival, at first, and for actively gathering interest in the social goals they try to solve [Waldner, 2020]. The reputation of a social venture is one of the most important and distinctive intangible assets of the organization [Fombrun et al., 2000]. The benefits of having a good reputation are especially relevant for starting companies, as one cannot assess them by their previous performance, and this builds legitimacy for the organisation a priori to them having any measurable development. Moreover, in the case of social entrepreneurship, the added social dimension shifts the attention from profits to the potential of social impact, contexts where legitimacy and reputation are significantly more important [Waldner, 2020]. Stakeholders will have different expectations and requirement from the firm, both individually and across stakeholder groups, implying that a stakeholder theory approach is also required when discussing reputation [Fischer and Reuber, 2007]. Moreover, they will differ in the involvement within the company, as well as the information they have about activities, goals and culture. This indicates the necessity for a coherent, concise description of operations, purpose for which entrepreneurial stories are best suited.

2.3 Entrepreneurial Storytelling

A conceptual, general definition of a story, also called a narrative, would be that of ‘the representation of a series of events’ [Onega and Landa, 2014]. In a more pragmatic way, the one used throughout this study will be that of a ‘collection of events arranged in a temporal sequence and containing a causal explanation’ [Onega and Landa, 2014] [Roundy, 2014]. The effects of having a persuasive and expressive story are usually regarded as significant, but the main drivers are not well researched yet. It is known that stories have the power to influence people through means of cognitive mechanisms, such as sensemaking, categorisation, learning and legitimacy building [Roundy, 2014]. However, the main benefit of a narrative might come from the emotional content it delivers. So far, it is clear that neither the integration of stories, nor the impact they have on people are done only through means of cognitive thinking and rationality alone [Coplan, 2004].

Storytelling is starting to be seen as an increasingly important aspect of branding and more research is being dedicated to this field of study. On an internal level, storytelling sets the tone and the expectations for the first steps of an entrepreneurial venture [Garud et al., 2014]. While this version of storytelling could be equated to simply plans that are exposed to the external audience, be that the general public, investors or other stakeholders, they do shape the way internal plans are structured. Moreover, they become the standard by which young companies measure their successes and, more importantly, their failures, as missing important milestones from their stories is labelled internally as failures, regardless of what the business plan actually states. Moreover, various stakeholders might be negatively impacted by the irregular trajectory of a business. Hence, a coherent, consistent story is important to maintain a general direction at all levels of business interaction, both internally and externally.

Another facet of storytelling, and arguably the actual purpose, is found in the scope of legitimacy building. A working definition of legitimacy is not unanimous amongst business scholars and, moreover, the social norms it is linked to vary between cultures and are con-

stantly shifting. Hierarchical definitions point to the fact that legitimization is the process where organisations justify their right to exist to peers or superordinate systems, whereas some other definitions link organisational activities to the norms of behaviour accepted in the social system [Suchman, 1995]. Ultimately, legitimacy refers to the expectations and generalised perceptions to the company and its projects [Rendtorff, 2019]. Entrepreneurs might want to align themselves with a greater purpose or a social movement, and this is even more important in the case of social ventures. Adverse trajectories related to the initial storytelling have a compounding negative effect on organisational legitimacy [Ashforth and Gibbs, 1990]. After such incidents legitimacy is difficult to be reestablished and might be permanently damaged throughout the entire stakeholder network, with cascading negative impacts on reputation if the adverse events are significant.

Generally, expectations are different to aspects pertaining to storytelling due to their requirements of legitimacy, in the sense that broad expectations do not require significant legitimacy from neither company, nor stakeholder, in order for it to have an effect on success perception [Garud et al., 2014]. In that sense, informal expectations (e.g. simply wording promises) do not create any legal or binding contract, but they have a role in shaping the trajectory of businesses and setting goals. Even if initial promises are potentially unsustainable, which eventually leads to disappointment, they have to be impressive and inspirational, such as to obtain the interest of investors and stakeholders. Moreover, entrepreneurial ventures are still in the process of calibrating themselves, their team and the speed at which they implement project, so cycles of hype and disappointment are necessary in order to view their own ability to match promises and deliver on expectations [Geels and Smit, 2000]. Ultimately, 'making the plan' and 'following the plan' are different activities that need alignment for implementing strategic goals and maintain good reputational legitimacy, and this alignment tends to be obtained through processes of trial and error [Pinto and Slevin, 1987]. Storytelling helps in having a coherent general vision that shows the overall direction of a social enterprise, but can also be adjusted to meet additional expectations.

3 Theoretical Framework

3.1 Hypothesis 1: Reason

One of the assumptions of neoclassical economics is that humans are rational decision-making agents [Keita, 1992]. As such, people are described as being rational decision makers that maximise their utility and are well informed on the relevant topic. This theoretical perspective extends to every aspect of economic dimension, including interacting with social enterprises, and it has the potential to be a crucial aspect in storytelling decision-making. The rationality of humans, as well as their analytic comprehensibility, is found to be accurate and beneficial in economic models, proving that the decisions of humans are consistently and significantly better than randomness [Hammack et al., 2017]. As such, people are able to interpret analytic information in such a way that the presence of factual information enhances their capacities to take decisions, implying that rational people see rational information and quantitative metrics as preferable to a lack of it. Current research shows that quantitative language is vital to legitimacy building, transparency and disclosure, which in turn is highly beneficial to reputation, in the case of entities focused on either economic value or social value.

Several points of analysis focus on the way social enterprises use reason and quantifiable metrics to build legitimacy, including that of seeing social enterprises as a business agent which obeys business rules [Dart, 2004]. The respective institutional theories state that it is legitimacy, rather than efficiency, which is the primary goal of businesses and is the main driver in decision-taking activities. As such, having an actor which is able to leverage reason and objective metrics will tend to increase the legitimacy of the social venture, in turn leading to a heightened sense of success and reputation. This is further validated by ways in which crowdfunding entities build legitimacy [Frydrych et al., 2014] [Dey and Marti, 2016]. The interpretation of crowdfunding platforms as contexts of social exchange require them to accurately and constantly communicate various metrics, such as goals, current investments,

specific dates of action and further developments. This ongoing disclosure of quantitative information creates trust and legitimacy, ultimately leading to a higher rate of project success. As such, there is evidence to sustain that having a story with rational elements leads to an increased perception of legitimacy.

As transparency is a vital element in the business environment, social entrepreneurship has followed suit. The concept of ‘blended value accounting’ consists of the ways in which social ventures have a strategic approach on reporting practices, using them in a creative manner to successfully reach their organisational mission objectives [Nicholls, 2009]. Arguably the most used metric for social ventures, it is becoming a golden standard for reporting and standardising [Manetti, 2014] [Anner, 2016]. By focusing on this quantitative and comprehensive metric, and also accurately communicating it to stakeholders, social enterprises have gained reputational benefits through increased transparency [Bonini and Emerson, 2005]. The concept of communication controlling is derived from the field of controlling and management accounting from management theory. It functions in a similar way to blended value accounting, as it is a theoretical framework to increase transparency in several aspects of the business [Zerfaß, 2010]. In this framework, three types of rationality are concomitantly leveraged on to further the strategic goals of the company; these are results-based rationality, procedural rationality and input-based rationality [Weber and Schäffer, 2008]. These types of rationality target controlling in general, but it is in the particular case of market communication and public relations communication that this approach leads to increased legitimacy [Marion, 2006]. One of the suggestions for an efficient process of communication management is to have a system focused on rationality assurance, concentrated on data-driven input-output decisions and metric-based targets. As such, businesses use the required metrics that they have to disclose as tools to further their hybrid goals through means of increased transparency and focus on communicating rationality assurance.

In conclusion, both reputation and transparency are valid mechanisms through which social entrepreneurs develop the perceived reputation of their companies. However, the

mechanisms used to express these concepts are through implementing metrics, statistics and other quantifiers, with the methods focusing on rational perception and data-driven analysis. The respective hypothesis assumes that the presence of rationality itself, through means of quantitative communication, will lead to an increased perception of reputation, in a direct way that is not mediated or moderated by factors such as legitimacy, trust or transparency.

H1: A more rational storytelling, expressed through communicating quantitative information, positively affects the perception of reputation of social ventures.

3.2 Hypothesis 2: Emotion

At the origin of utility theory in economics, Jeremy Bentham intensely used the idea of emotion and subjective feeling to describe the way people will and should react [Bentham, 1996]. While neoclassical theories have discarded any real discussion on feelings, modern economic theory has started to revalue the impact of emotional perception in decision making [Loewenstein, 2000]. Humans have a very high capacity for empathy and for creating an emotional rapport with elements that show significant emotional content [Lamm et al., 2019]. Storytelling, through its intrinsic nature, has the purpose of eliciting emotion in people, which makes the effective communication and transmission of emotions not only a factor to be wished for, but a necessary element to any story. This is particularly relevant in literary contexts of storytelling, but it is nevertheless true and valid when considering entrepreneurial businesses. Already, in the world of virtual reality, the focus on emotional storytelling is suggested to create feelings of attachment and immersion [Blom and Beckhaus, 2005].

The use of emotional branding has quantifiable and significant impact on the brand perception, brand loyalty and propensity of purchase. The presence of emotional content in television advertisements leads to a three-fold increase in the number of purchase intentions in the context of food advertisements for children [Kim et al., 2016]. In this case, children exposed to repeated and emotional television marketing campaigns of sugary or high-fat foods preferred the unhealthy option even long after such campaigns were no longer seen,

turning them into long-term customers. Similarly, having a customer that is emotionally attached to a company leads to a 52% increase in purchasing amount, on average, when compared to a customer that is simply satisfied [Grindrod et al., 2016]. To further these observations, a study on fashion brands has shown that the use of emotion in branding has had a significant increase in the brand loyalty of consumers [Kim and Sullivan, 2019]. The attachment can be further enhanced through emotional semantics, as the way people relate to the emotional content of the information they receive has been proven to be an important driver of purchasing behaviour [O’Shaughnessy and O’Shaughnessy, 2002]. The effective implementation of emotional storytelling has led to an increased attachment to the brand by existing consumers, which have started to identify themselves with the respective fashion brand, thus becoming passive brand ambassadors. Moreover, this has proven to be a great differentiator in the specific context of fashion brands, an already crowded industry [Kim and Sullivan, 2019].

In turn, social ventures have specific capacities and limitation when it comes to their marketing capacities. The challenges revolve around the lack of resources, lack of expertise, legacy mindset and the consumption patterns of people [Bandyopadhyay and Ray, 2019]. This prompts social ventures to have a wide array of techniques and strategies to engage with consumers, including a minimalist and ad hoc approach to marketing or cost-effective strategies like word-of-mouth and social media. Also, the use of very emotional stories has the potential to attract media attention, which has significant benefits at low financial costs. In traditional for-profit ventures, narratives are used to influence stakeholders through the cognitive mechanisms of as legitimation and categorisation [Martens et al., 2007]. Conversely, emotion is highly impactful in social entrepreneurs, fulfilling three main tasks: capturing attention, creating connections and inspiring action [Roundy, 2014]. Investors require things that go beyond metrics in order to keep their attention alive. Further on, the same study observes that creating an emotional connection with stakeholders is critical to creating a bond with them. Lastly, requiring people to change their consumption habits and inspiring

them to propagate social value is spurred mainly by the heightened emotional content and intensity of the narratives.

The results of previous studies are leveraged on to base an assumption regarding the way people perceive the reputation of social entrepreneurial ventures. Emotions, expressed through various contexts and channels, are powerful determinants of consumer behaviour and can affect the decision-making process. In particular, emotions in written text expressed through emotive language heighten the level of implication of readers with the narrative [Edwards, 1999]. When interacting with stories, the emotional content should elicit subjective feelings that lead to a better perception of the company and a heightened view of their reputation.

H2: A more emotional storytelling, expressed through emotive language, positively affects the perception of reputation of social ventures.

3.3 Hypothesis 3: Reason vs Emotion

Aside from the intrinsic benefits and effects of rationality and emotion in the decision-making process, a hierarchy between the two can be attempted and analysed through economic and business theory. In recent years there have been several articles that debated neoclassic economic assumptions of perfect rationality, with the general consensus being that people are far from the perfect rationality that was initially assumed for model simplicity [Levine et al., 2015]. Firstly, mathematical arguments have been drawn to the fact that the evolution of mankind is based on the existence of both reason and emotion [Nowak and Highfield, 2011]. As such, aiming to purely maximising selfish rewards is not a viable strategy for neither individuals, nor groups, as some aspects of utility theory might suggest [Pepper, 2019]. With respect to visceral emotions alone, such as hunger and pain, it can be said that they have a more important weight of decision in daily functioning than the rational high-level cognitive processes [Loewenstein, 2000]. In the decision-making process, humans use the full array of capabilities they are equipped with. Both emotional intelligence

and analytic capabilities have uses in the process of decision making, but there are contexts where either of them takes the lead. Trivial examples are chess, for reason, and meeting with friends, for emotion. The interaction between customers and businesses has long been assumed to be transactional and purely functional, but the paradigm has started to change in the past decades.

Examples show that strategic thought involves emotions at the same level as it involves rationality [Gilkey et al., 2010]. Entrepreneurs and other high level executives also use both elements when taking decisions and making a hierarchy between their choices. Research findings show that often the choices they make are different to the ones that rationality would have dictated, which means emotions are assigned a greater weight in the analysis [Horide, 2003]. Emotions are split into three categories: tendencies, moods and feelings. According to this segmentation, the thought process varies depending on the nature and type of emotion felt, but these are always present in the final step of the decision. Tendencies, both positive and negative, have a much stronger influence on the decision making process than ration [Horide, 2003]. On that note, the association of rationality with intelligence can only be regarded as incomplete, given that intelligence has many interrelated facets [Stanovich and West, 2014]. It is also unreasonable to regard irrationality as a lack of intelligence. For example, one’s sensitivity to emotions, as part of fluid rationality, is a good predictor of how people react to emotional input and their capacity to interpret such information.

In the context of social ventures pitching to investors, there was a clear tendency to offer capital to ventures that delivered an emotional narrative instead of those who presented accurate metrics and targets alone [Roundy, 2014]. Quotes from the interviews in the article include that “No one is going to give you 5 million dollars because of a mathematical calculation” and “if you’re fundraising for a social enterprise, you have to tell stories. If you don’t have a good story you’re not going to get the results you want”. However, the combination of both reason and emotion in the narrative was the best predictor of suc-

cessful funding, especially since an adequate level of metrics and statistics is necessary for investment pitching. Similar studies done outside business contexts point to the fact that the most important way through which stories impact and influence audiences are through eliciting emotive responses [Escalas and Stern, 2003] [Dunlop et al., 2008]. This shows that emotions are a fundamental aspect of any story, but also that there are business contexts where emotive language is valued better than quantitative language.

When it comes to the way storytelling affects the perception of reputation, the presence of both dimensions of reason and emotion are presupposed to increase the level and degree of positive perception. However, the emotional dimension of perception tends to have a higher weight in decisions and there is a strong tendency to have emotions higher in the hierarchy than rationality. With this in mind, the impact of the emotional and subjective aspect should be significantly higher than that of the reasonable and objective, given the particular context of social entrepreneurial ventures.

H3: The presence of emotion in the entrepreneurial story, expressed through emotive language, leads to a higher perception of reputation than the presence of reason, as expressed through communicating quantitative information.

3.4 Hypothesis 4: Sex

There has long been a perception that females and males perceive emotions distinctly, due to their biological differences and to the traditional cultural association with the respective genders (male - man, female - woman) [Eagly, 1987]. Such a theoretical framework is presented in the emotional sensitivity hypothesis, which “posits that women are more likely than men to notice subtle or ambiguous emotional displays of others” [Moskowitz and Dewaele, 2020]. As such, females are perceived to be more aware of the emotional surroundings and observe the small variations in the emotional content of the context, while also being able to interpret it with greater accuracy. The variations between males and females are though to have a mixed background, stemming from a combined area of factors from biological and

social sources and their interaction [Putrevu et al., 2001]. The biological elements include chromosome mapping and hormones, whereas the social ones include gender identity and their perceived role in society.

Social role theory points to the fact that the division of labour between the two sexes creates expectations pertaining to gender-roles, which then further on lead to differences in the social behaviour and personality [Eagly, 1987]. On this matter, females have traditionally kept roles that heavily imply a higher degree of emotional awareness, cohesion and stability, such as nurse, teacher, secretary, while also being the main (and sometimes sole) active caretaker of children. Furthermore, females were found to score higher on areas pertaining to interpersonal relations and integration of emotional information, whereas males scored higher on dimensions related to aggressiveness [Costa Jr et al., 2001]. Studies have shown that females are more likely to show emotions through facial expressions and they are also more receptive when observing such facial cues [Eisenberg et al., 1989]. These results generalise to non-verbal communication, as they are also better at decoding non-verbal emotional information, with differences being consistent and significant for adults at all ages [McClure, 2000]. Hence, these findings conclude that females are better at sensing emotions and integrating them.

The way emotions are perceived extends also to the intensity with which different sexes feel emotion, with females feeling both negative and positive emotions much more intensely and vividly [Fujita et al., 1991] [Grossman and Wood, 1993]. Regarding positive emotions, females report greater emotional expressiveness, warmth of expression and concern for others than males do, while also showing increased levels of life satisfaction and happiness [Spence and Helmreich, 1978] [Wood and Rhodes, 1992]. Conversely, they are also more susceptible to depression and higher levels of negative affect, alongside greater intensity of fear and sadness [Gove, 1972] [Wallbott et al., 1986]. Not all dimensions related to emotional perception show a significant advantage for females, and there is a common misperception that females are significantly better at verbal skills, including tasks associated

with emotional expression and integration. However, numerous studies addressing this issue from a biological point of view have found that this difference vanishes after childhood [Sherman, 1971] [Hyde and Linn, 1988] or even that there are no variations whatsoever, at any age [Higgins, 1976], making the overall results inconclusive. Nevertheless, there is sufficient evidence to postulate that females feel emotions more intensely than males in most contexts.

A modern study has aimed to find a coherent and statistically significant result for the variation between the emotional perception between sexes and further validate or refute previous research [Fischer et al., 2018]. The task of verifying the emotional sensitivity hypothesis was done through experiments that differed from others in the type of task that mapped the emotional accuracy. While still observing if the participants were able to identify the emotion of a presented image, the current study used an emotion intensity profile task in which participants have to quantify the intensity of several different emotions, thus diverging from the standard categorisation task, which meant that the participants had to choose the correct option out of a given set. The main results of this study were the fact that the emotional sensitivity hypothesis was disproved, meaning that males and females are equal in their capacity to perceive and label target emotions at low levels of intensity. However, there was marginal evidence that there is a difference when the emotional content is moderate or heightened, with females being more perceptive. Alongside this, the study also observed that females are significantly better at accurately detecting the existence of non-target emotions and labelling them as such. Hence, it is to be expected that females react more intensely than males to a story if the narrative contains highly emotive language.

Thus, we conclude there is sufficient evidence to show that females might react more intense to a more emotional stimulus. Building on the assumptions of Hypothesis 2, it is also assumed here that the presence of emotive language leads is beneficial to reputation perception. Therefore, the presence of either positive or negative emotional triggers, such as intensely emotive language, in entrepreneurial narratives should prompt a significantly

higher perception of reputation for females than for males.

H4: The presence of emotion in the entrepreneurial story, expressed through emotive language, leads to a higher perception of reputation for females than for males.

4 Method

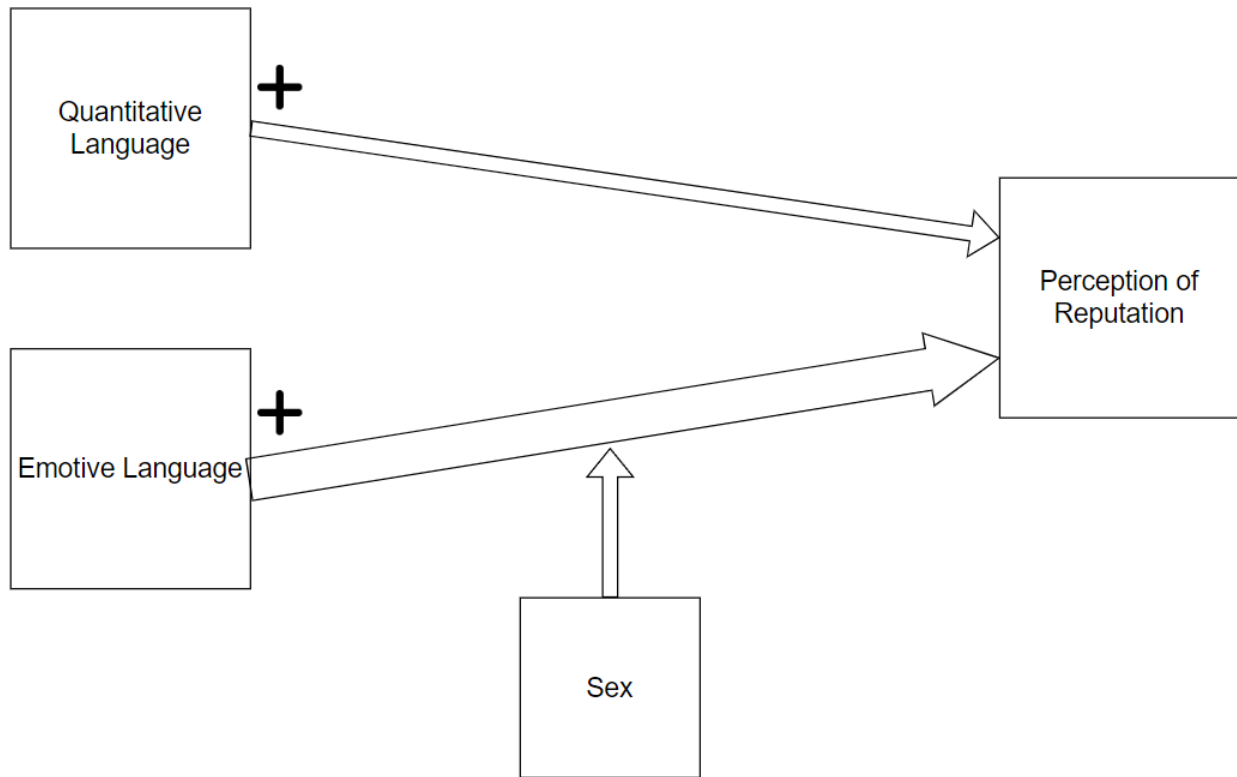


Figure 1: Experiment Model

4.1 Method

The study aims to segment stories into components, in particular the two main types of expressing information, through reason and emotion. Thus, the impact of quantitative and emotive language is calculated, measured and the relationship is analysed, which elicits the use of quantitative methods. As such, the method of the research is analysis through an online experiment. The experimental design is 2 x 2 mixed online experiment. The between-subjects variable is the emotive language, and the within-subjects variable is the quantitative language. The independent variables are quantitative language, emotive language and sex. As such, people receive a questionnaire where they are asked to rate the perceived reputation of the respective company. The experiment manipulates for emotive

language, with one questionnaire having only a rigid, flat type of expressions and the other only emotive language. Within each questionnaire there are presentations of companies that include narratives with quantitative language and narratives absent of metrics, expressing generalities and a vague type of communication. Finally, the emotive language variable is mediated by the sex variable within the analysis. The list of stories can be seen in Subsection 8.6 of the Appendix.

Within the questions of the experiments, the respondents had, in each case, to answer a question that checked their attention, in a very explicit and intuitive format “Select ‘Disagree’ if you are paying attention”. Respondents which did not pass this attention check were excluded from the analysis, as their answers would introduce attention bias to the results. This was such that the attention of the respondents was regarded to be sufficiently high, thus leading to quality responses and data, without any lowering of the scale validity [Kung et al., 2018]. The questions were put in the last story of each case, just before demographic data, as it is assumed that the attention decreases as the survey progresses [Conrad et al., 2010]. Thus, having this attention check significantly increases the reliability of the data.

4.2 Ration - Quantitative Language

The general concept of rationality is operationalised through the notion of quantitative language. By quantitative language it is meant expressing and communicating through quantitative information and measurable data [Shuy, 1977]. The variable has two levels: high, where such quantitative and objective information exists, and low, where quantifiers are absent and the language is vague.

Mathematics, as a whole, has always been seen as the pinnacle of objectivity and rationality [Struik, 2012]. Generally regarded as the language of reason, mathematics invokes rationality within all contexts it is found, business being one of them [Yanofsky, 2016]. Studies concerning brain activation when doing mathematics or observing quantifiers support the

fact that when interacting with quantifiers, the areas of the brain that become most alert are the ones generally linked to rationality and objective analysis. The use of basic arithmetic for adults triggers activation in the brain centres which focus on attention, executive processes, and working memory, associated to reason and general rationality [Abd Hamid et al., 2011]. Such results are consistent for children, for whom processing of numbers activates the same brain areas [Arsalidou et al., 2018] [Agostino et al., 2010]. In a study on Malaysian students, it was found that their approach to middle school mathematics guides their choices for job selection and that they associate mathematics with rational thought [Kasmin et al., 2019]. As such, neuroscience shows that there is a strong association in the brain between reading mathematical quantitative text and activating the pathways responsible for reason.

When people first see a narrative they have a cognitive reaction and they invoke pre-existing scripts or schemas of cognition [Oatley, 1999]. Additionally, business text analysis done on Harvard case studies have associated the presence of financial analysis and statistics with rational realm of analysis [Swiercz and Ross, 2003]. Thus, expressions that allude to mathematics, such as various quantifiers or simply numbers and percentages, induce a feeling of analytical objectivity in the given sentence, which expands piece-wise to the aggregated story and message of the given enterprise. Hence, the way quantitative information is operationalised in this experiment will be through the presence of numbers, ratios and general quantifiers. We take note that, for brevity, the analysis will label variables as ‘ration’ or ‘rationality’, in actuality meaning ‘quantitative language’. Moreover, the presence of quantitative language is expressed as ‘high rationality’, whereas the absence is labelled ‘low rationality’.

4.3 Emotion - Emotive Language

Emotive language is the operationalisation of the general level of emotion expressed through a particular story. Through emotive language it is meant a set of dialectical and rhetorical strategies used with the purpose of persuasion through emotion

[Macagno and Walton, 2010]. The levels of this variable are high, when the language is emotive, has impactful words and vivid images; and low, when these elements are absent and the tone is flat and rigid.

First of all, some of the brain areas that activate when seeing images are the same ones that activate when reading about such images, such as the occipitotemporal cortex [Mitchell and Cusack, 2016]. Alongside the amygdala, the occipitotemporal cortex is responsible for emotional understanding and perception [Adolphs, 2002]. Moreover, the amygdala tends to activate more when humans read impactful words, which links the intensity of the emotional content of specific words to the intensity in which they are mentally perceived and the emotional response triggered [Panksepp, 2008] [Garolera et al., 2007]. These correlations are even stronger when observing for spoken words and segmenting the emotional stimuli into positive and negative, both of which lead to intense amygdala response [Hamann and Mao, 2002]. As such, the brain areas which activate when reading text that contains emotive language and visual depictions are the same areas responsible for emotional perception and reaction.

In the particular case of narratives of social ventures, people may tend to feel uncertain when their mental structures do not allow for a preexisting integration of the information in the story. In such a case, they rely on emotions and emotive response to guide their understanding [Oatley, 1999]. Social ventures are established elements of the financial world and they are well integrated in global business environment, but people still have infrequent experiences with them. This means that there is little to no chance of people having detailed schemas of thought in understanding stories communicated by these companies [Hsu and Hannan, 2005]. Thus, within the experiment, emotive language is operationalised through the emotional response elicited by descriptions of vivid images and high impact words. We take note that, for brevity, the analysis will label variables as ‘emotion’, in actuality meaning ‘emotive language’. Moreover, the presence of emotive language is expressed as ‘high emotion’, whereas the absence is labelled ‘low emotion’.

4.4 Dependent Variable

The dependent variable is the perception of the company's reputation. This is operationalized through a 7-point scale ranging from 'Strongly Disagree' to 'Strongly Agree' on five items [Baer et al., 2018]. Moreover, the respondents are asked to declare their willingness to purchase from the given entity with a similar 7-point Likert scale [Funk et al., 2010]. These results are aggregated by averaging results, in order to reveal the perceived reputation people have regarding the company in case. Throughout the analysis, the resulting number is referred to as 'score'.

4.5 Control Variable

Sex is used as a mediating variable for emotive language, as well as a control variable in initial data collection. The control variables are age, country of origin, income and level of education, related to the demographic data of each respondent. There is evidence to sustain that age can influence the way emotion is perceived in a marketing context [Williams and Drolet, 2005]. There is ample evidence that the country of origin of ventures affects how people perceive its reputation, which questions the potential parallel relation between the country of origin of respondents and how they generally react to social venture narratives [Newburry, 2012] [Michaelis et al., 2008]. The level of income is significant into how people are able to perceive emotions and regulate them, with childhood differences being propagated into later ages [Garner and Spears, 2000]. Similarly, the level of income is strongly correlated with the level of education. The latter is also a strong determinant into emotional intelligence and how one is able to integrate emotions and combine it with rational decision making [Degasperi and Mainardes, 2017]. Regarding philanthropy and the willingness to donate, researchers find a positive link with age, income and level of education [Bekkers and Wiepking, 2011]. Ultimately, the variables country of origin, income and level of education did not create sufficient statistical power for each bucket, which has meant that they are not able to be integrated as control variables in the main analysis. An incipient

analysis and segmentation is found in Subsection [8.4](#) of the Appendix.

5 Pre-Test

Before the main analysis was done, a pre-test was formulated in order to see if the theorised expressions for rationality and emotion in the stories are adequate. As such, three cases were devised with varying levels of assumed quantitative language and emotive language. In each case, a story from the main experiment was taken and the respondents were asked how rational and how emotional they perceive the story to be. The purpose of this was to observe if the pre-supposed level of ration and emotion matches the perceived level of the respondents. As in the main experiment, the stories include descriptions of the company, as well as a quote from the CEO, and the latter contains elements that determine the level of rationality and emotion. The list of stories used can be found in Subsection 8.5 of the Appendix

The three cases are stories that are segmented in the following way, according to the level of assumed emotion and rationality: low rationality and low emotion (LR.LE), high rationality and low emotion (HR.LE), low rationality and high emotion (LR.HE). For each of these, the answer to the question regarding how rational the story is perceived is marked with an “R”; similarly, the answer to the perceived emotion is marked with an “E”. As such, the following table summarises the pre-test data:

1. LR.LE.R stands for the **rational** dimension of the **low rationality, low emotion** case
2. LR.LE.E stands for the **emotional** dimension of the **low rationality, low emotion** case
3. HR.LE.R stands for the **rational** dimension of the **high rationality, low emotion** case
4. HR.LE.E stands for the **emotional** dimension of the **high rationality, low emotion** case

5. LR.HE.R stands for the **rational** dimension of the **low rationality, high emotion** case
6. LR.HE.E stands for the **emotional** dimension of the **low rationality, high emotion** case

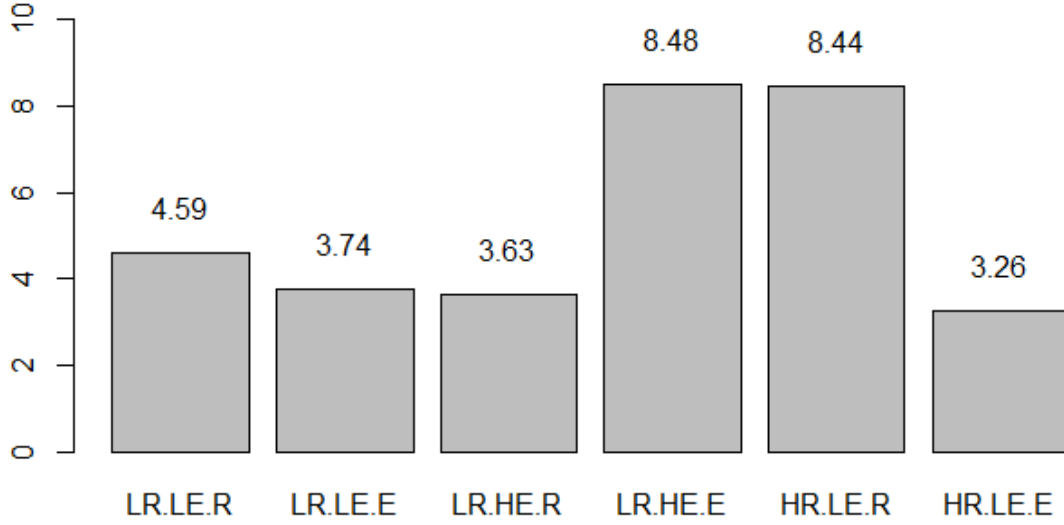


Figure 2: Mean Comparison

Figure 2 shows a bar plot with the means, as well as the numbers themselves, which should make means comparison easier and more direct. This figure presents the additional information that LR.HE.E and HR.LE.R have similar high means, just as LR.HE.R and HR.LE.E show comparable low means.

A more advanced analysis of the pre-test data is found in Subsection 8.2 of the Appendix, alongside the t-test that check for statistical significance. There it is shown that statistically significant evidence exist for the assumption that people are able to perceive HE cases as being more intense emotionally than LE cases. Furthermore, there is also statistically significant evidence that people are able to perceive HR cases as being more intense rationally

than LR cases. Moreover, it can easily be distinguished between the intensity of variables when one of them is intense and the other isn't, such as in LR.HE and HR.LE. Finally, people associate the same level of intensity with both variables in the case LR.LE, where both operationalisations had a pre-assumed level of low intensity. This all leads to the fact that the operationalisations are correct and the stories of the experiment are well built for the current analysis.

6 Results

An in-depth analysis of the raw data is found in Subsection 8.3 of the Appendix, which contains the steps taken to clear the data and the conditions necessary for keeping data points and an initial analysis on the raw data, alongside the observation that it is not normally distributed. Following this, the data undergoes a transformation that renders all variables normal, aspect which is thoroughly checked and validated through several methods. Throughout this analysis, the variables from the data are named according to acronyms which map the four cases in the following way, similarly to the pre-test structure:

1. LR.LE stands for **low rationality, low emotion**
2. HR.LE stands for **high rationality, low emotion**
3. LR.HE stands for **low rationality, high emotion**
4. HR.HE stands for **high rationality, high emotion**

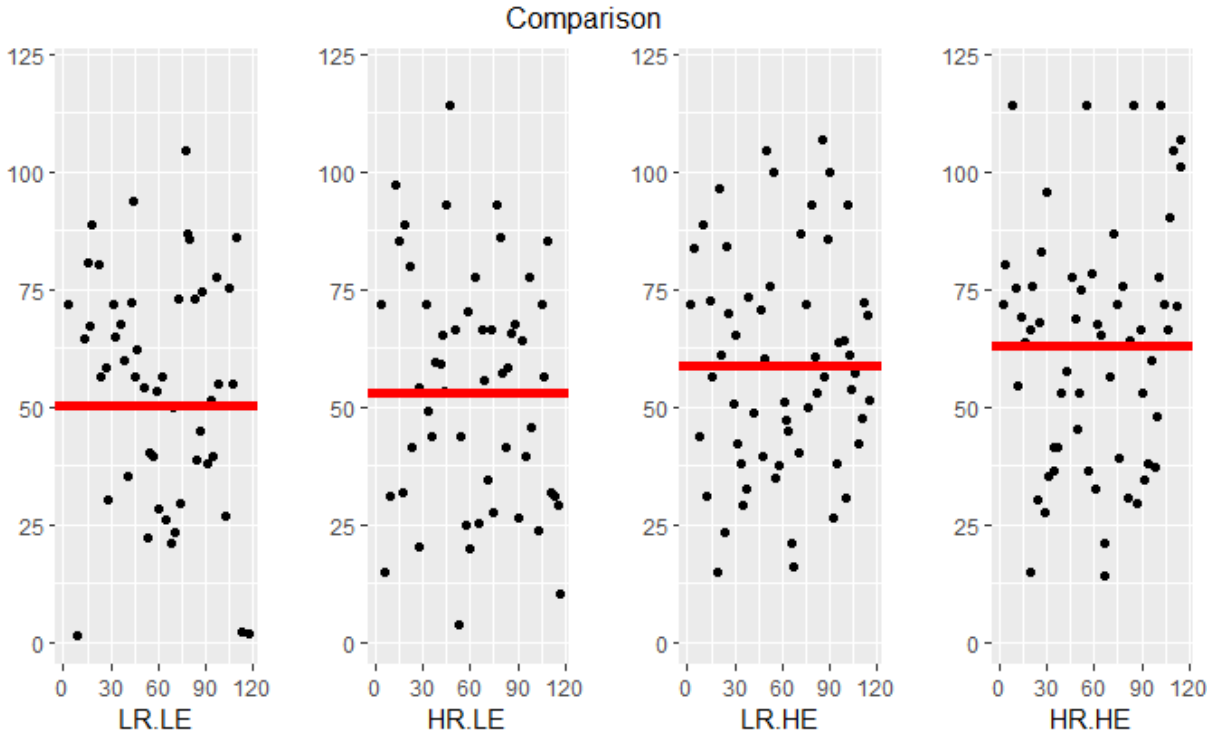


Figure 3: Distribution Comparison

Figure 3 shows the distribution of the data points after the transformation for each case, as well as the mean, represented by the red line. The graphs are scaled to the same size 0–125 in order to better observe the variations, outliers and to be able to accurately compare the averages. First of all, it can be graphically observed that the mean is in increasing order, matching the hypotheses. It can also be observed that the low emotion cases (LR.LE and HR.LE) have several outliers with low values (< 10), with HR.LE having 2 such values and LR.LE having 3 of them. The graphs also give visual descriptives of the moments of the data, as there is no significant grouping of data points on either side of the mean, which would have been a sign of skewness, and there are no extreme outliers, which would have been a sign of kurtosis. Further on, the hypotheses postulated in Section 3 are checked and analysed. Subsection 8.4 looks at a post-hoc analysis on age and statistically analyses the difference between HR.HE and LR.LE.

6.1 Reliability Analysis

	LR.LE	HR.LE	LR.HE	HR.HE
Alpha	0.939	0.963	0.916	0.932
Items	12	12	12	12
Sample units	117	117	117	117

Table 1: Reliability

In order to be sure that the measurement error is minimised, as well as the fact that it is consistent over time, the data was submitted to a reliability analysis. Within this analysis, it is measured if the responses have the same response to the given conditions. The main element of this analysis is through calculating Cronbach’s alpha, which is a measure of internal consistency and scale reliability [Cronbach, 1951]. The threshold for considering that the data is reliable and consistent is $\alpha > 0.7$ [Warrens, 2015]. The Cronbach’s alpha for each case is seen in Table 1. The very high level of Cronbach’s alpha for each individual case

points to the fact that the results have a very high degree of reliability and the variables in case are reliable constructs.

6.2 H1 Analysis

Alternative H	t-value	df	p-value
HR.LE > LR.LE	-0.537	105.62	0.295
HR.HE > LR.HE	-0.960	114.79	0.169

Table 2: T-test H1

Table 2 shows the result of the t-tests that map the first hypothesis. The tests are one-sided, with the alternative hypothesis being that the group with the higher mean is expected to be significantly higher, as shown on column Alternative H. Here we analyse the resulting scores for the stories with quantitative language (HR) with their counterparts that do not have quantitative language expressed in them (LR). Thus, we pairwise compare HR.LE with LR.LE and HR.HE with LR.HE in order to see if the variation in means is statistically significant. The benchmark for having such a result would be a p-value of 0.05 or lower. In this case, even if the mean of HR.LE is larger than the one of LR.LE ($53.151 > 50.351$) and HR.HE than LR.HE ($62.917 > 58.551$), the variation is not large enough in either comparison for it to constitute a significant variation, as the test fails at p-value 0.295 and 0.169, respectively. As such, H1 is refuted on the basis that the difference is not statistically significant and we conclude that the presence of quantitative language in a story does not significantly increase the perceived reputation of social entrepreneurs.

6.3 H2 Analysis

Alternative H	t-value	df	p-value
LR.HE > LR.LE	-1.693	104.29	0.046
HR.HE > HR.LE	-1.999	110.03	0.024

Table 3: T-test H2

In order to validate the second hypothesis, we must analyse the resulting scores for the stories with emotive language (HE) with their counterparts that do not have emotive language expressed in them (LE). In Table 3 we pairwise compare LR.HE with LR.LE and HR.HE with HR.LE in order to see if the variation in means is statistically significant. The mean of LR.HE is larger than the one of LR.LE ($58.551 > 50.351$) and, on average, HR.HE is larger than HR.LE ($62.917 > 53.131$). The p-value for both comparisons is lower than the benchmark of 0.05, with the first only being only slightly lower than the benchmark. This shows that both variations are substantial and the alternative hypotheses are accepted. As such, there is agreement in both comparisons that the means are significantly different at 95% confidence. Thus, we conclude that H2 is confirmed and the presence of emotive language in a story significantly increase the perceived reputation of social entrepreneurs.

6.4 H3 Analysis

Alternative H	t-value	df	p-value
LR.HE > HR.LE	-1.159	106.91	0.124

Table 4: T-test H3

The third hypothesis postulates a higher score for stories that express only emotive language (LR.HE) than narrative that contain quantitative language alone (HR.LE). In order to test H3, we compare the cases LR.HE and HR.LE in Table 4 in order to observe if the alternative hypothesis is true. Through mean comparison, LR.HE is larger than HR.LE ($58.551 > 53.131$). Nevertheless, the p-value of the t-test is 0.124, larger than the benchmark of 0.05. This means that the averages are not significantly different and we conclude that H3 is disproved. As such, the presence of emotive language alone in an entrepreneurial story does not lead to a significantly higher perception of reputation than the presence of only quantitative language in a narrative.

6.5 H4 Analysis

Subset	Male	Female	Overall
Overall	54.19	57.09	54.75
LR.LE	44.49	52.42	50.35
HR.LE	48.19	54.33	53.13
LR.HE	55.64	60.35	58.55
HR.HE	65.32	60.82	62.91

Table 5: Means Sex

The fourth hypothesis posits that females will score higher than males if the stories present highly emotive language (LR.HE and HR.HE). The analysis focuses on the HE cases, but the comparison for all cases is included for completion. In order to test H4, the means for sexes are tested in order to observe if there is any significant variation between the ratings for reputation according to the sex. The respondents with the option "Others" for

sex were excluded due to the low count of observations (8 data points in total), as any result obtained from it would have been biased. Moreover, the analysis breaks down the data into cases, and the average number of Others per case is 4, significantly bellow the an adequate number of data instances required for an analysis. Conversely, the data has 64 observations for Female and 45 for Male, numbers regarded as sufficiently robust.

Table 5 presents the mean for each case, segmented by sex, as well as the overall mean, for general comparison. It is noticeable that females rate higher than males on 3 out of the 4 cases, as well as in the overall average. For the hypothesis in question, it is the last two that interest us (LR.HE and HR.HE), and it is noticeable that there is no consistent trend of higher score for one of the sexes.

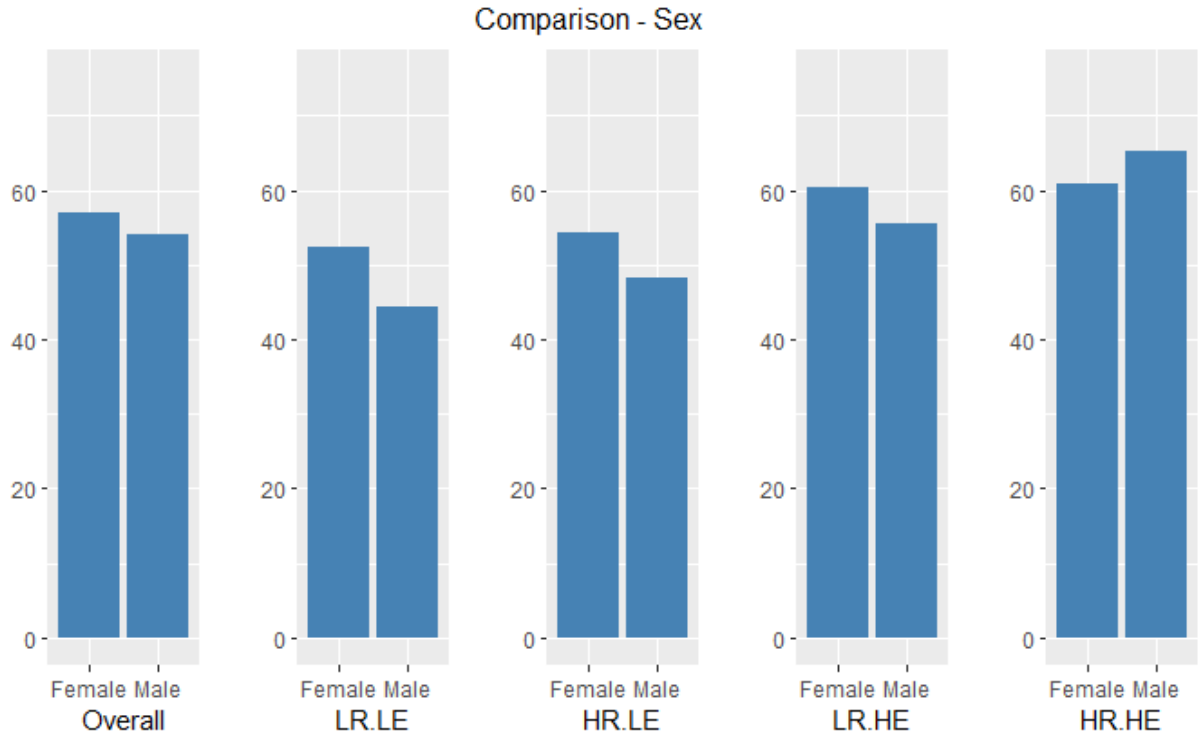


Figure 4: Comparison Sex

Figure 4 allows for a graphical comparison between averages, where it can be generally observed how significant the differences are. The difference in the overall context is minimal, while females still rate higher than males. The variation is highest in the LR.LE case and

the hierarchy changes in the HR.HE case, where males rate slightly higher than females.

Subset	t-value	df	p-value
Overall	-0.609	86.31	0.271
LR.LE	-0.970	38.20	0.168
HR.LE	-0.778	34.71	0.220
LR.HE	-0.755	52.55	0.226
HR.HE	0.628	45.90	0.733

Table 6: T-test H4

Table 6 shows the result of the t-tests done by comparing the means. As per the previous hypotheses, the tests are one-sided, with the alternative hypothesis being that the average for females is expected to be significantly higher than that for males, with the respective case shown in the Subset column. As shown previously in Table 5 and Figure 4, the mean for females is nominally greater than that of males for all cases, except HR.HE. The results for the other cases reveal that none of the cases show signs that the means are significantly different at 95% confidence. Thus, we conclude that there is not enough evidence in support for H4 and we reject it. This means that males and females do not react differently when interacting with a story with emotive language.

6.6 Regression

In order to observe the intensity and significance of each variable in the model, a multiple linear regression model is further analysed. The variables to be analysed are: Reason, Emotion, Sex and Age.

The regression has a residual standard error of 25.62 on 210 degrees of freedom. The

Coefficients	Estimate	Std. Error	t-value	p-value
(Intercept)	55.70	12.260	4.543	<0.001
ReasonLow	-3.377	3.486	-0.968	0.333
EmotionLow	-9.359	3.535	-2.647	0.008
SexMale	-3.072	3.667	-0.837	0.403
SexOther	17.596	13.143	1.338	0.182
Age	0.331	0.491	0.673	0.501

Table 7: Regression Output

multiple R-squared is 0.044 and the adjusted R-squared is 0.021. This shows that the variables in case explain an extremely small portion of the variance and are not, in general, great predictors of the overall variation in reputation. The F-statistic is 1.951 on 5 and 210 degrees of freedom and the p-value is 0.087. This result points to the fact that the regression does not have a statistically significant parsimony of variables, as it can be observed from the high p-value in several variables, which leads to low significance and small coefficients. By removing Age and Sex, the regression has an F-statistic of 3.381 on 2 and 213 DF and a p-value of 0.035. This shows a higher level of significance of the overall regression, but it does not have any substantial impact on either the estimates (-3.377 for Reason, -8.426 for Emotion) or the p-values (0.333 for Reason, 0.016 for Emotion). Moreover, the interaction coefficient between Emotion and Sex is excluded from the regression, even if it maps Hypothesis 4. This is done because of the extremely high p-value of 0.586 and because it alters the significance of Emotion without any positive impact on Sex or the overall regression. This addition would increase the p-value of Emotion up to 0.095, which is a 12-fold decrease in statistical significance.

The regression reveals that the only significant contributor to the variation of the output is Emotion. As such, the presence of emotive language tends to raise the perceived reputation by 9.359, and the variable is highly significant with a p-value of 0.008. As expected, the

presence of quantitative language also raises the level of perceived reputation, by 3.377 for this variable, but the p-value is too high to regard the result as significant. Males tend to score less than females by 3.072, whereas sexes labelled “Others” score higher than both, by 17.596 higher than females. Nevertheless, the p-value shows that sex is not a significant factor in reputation scoring. Finally, an increase in age by 1 year tends to increase the average score by 0.331; however, neither this result is statistically significant. The addition of an interaction effect between Reason and Emotion has a p-value of 0.824, which shows that there is no significant effect in the interaction between the two variables. No other interaction shows any signs of having a noticeable effect on reputation, neither by value of coefficient, nor by p-value.

Breusch-Pagan test is a method to observe if the residuals of a linear regression, such as the one in question, are heteroskedastic [Breusch and Pagan, 1979]. By analysing the p-value, if it falls bellow 0.05 then we consider there is considerable evidence that the residuals are not homoskedastic and have a fluctuating volatility. The exclusion of the other control variables (Education and Country) is a conscious choice, as the p-value of the studentised Breusch-Pagan test for heteroskedasticity falls under 0.05 (0.024 for Education, 0.041 for Country). As such, the focus is on the remaining variables, for which the test shows a value $BP = 5.949$ with 5 degrees of freedom and a p-value of 0.311, which means that the residuals of the regression are homoskedastic.

Figure 5 shows an analysis on the regression residuals. The graph on the left maps the residuals on the vertical axis with the fitted values of the regression on the horizontal axis, with the red line being the result of a hypothetical simple linear regression between the two. If the line were to show a visible direction or pattern, such as going upwards, downwards or having a sinuous pattern, then there would have been doubts about the normality of the distribution. As such, the fact that the line is close to the horizontal axis and similar in shape to a straight line strengthens the assumption of homoskedasticity. Moreover, it can be observed that there is no significant clustering of residuals on either the positive or

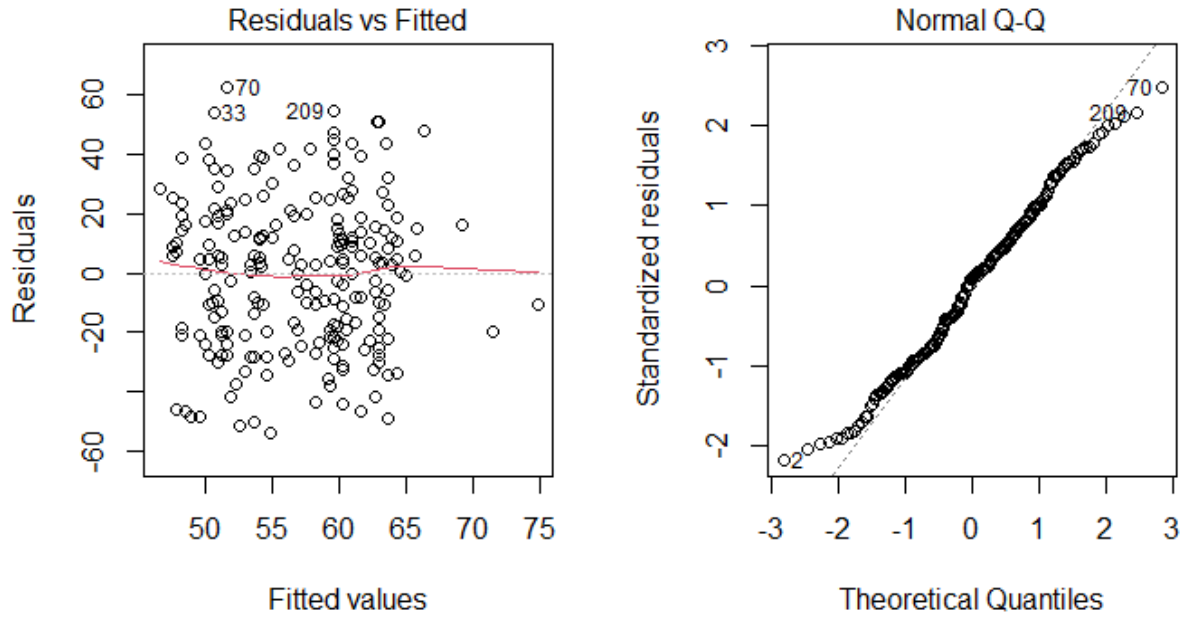


Figure 5: Regression Residuals

negative side, as well as no extreme outlier. As such, we again conclude that the residuals are homoskedastic and there is no significant loss of information from the regression. The graph on the right shows the Q-Q plot of the residuals. They accurately map the quantiles of a Gaussian distribution, without extreme deviations in the tails, which lead to the conclusion that the regression residuals are sufficiently close to a normal distribution.

The results of the residual analysis suggest that the coefficients of the regression and the p-values are correct, valid and we can interpret them as such. This result further validates the previous findings and maps the results of the hypotheses. Emotion is the only statistically significant variable and the presence of emotive language positively affects the score, which validates H2. The coefficient of Ration acts according to the hypothesised scheme, as the presence of quantitative language positively affects the score, but the fact that it is not statistically significant means that H1 finds insufficient support. Due to this, and also due to the fact that the interaction of Ration and Emotion is not significant, we draw the

conclusion that H3 is rejected too. Given that the interaction between Sex and Emotion is also not significant, we reject H4 too.

7 Discussion

7.1 Discussion

A rather famous and successful social venture is Tony’s Chocolonely, a chocolate manufacturer. They have used a successful differentiation strategy through means of storytelling in order to set them apart from regular for-profit chocolate manufacturer. The added element was the claim to alleviate and reduce chocolate slavery and underpaid cacao farmers, ultimately having a fair pay for all members of the chocolate supply chain [Roos, 2020]. The success of the company is evident, as they had more than 19% of the Dutch market share in 2018 and in 2021 they surpassed 100 million euro in revenue [financieel management.nl, 2018] [Chocolonely, 2021]. The excellent use of storytelling can be observed in the translated transcripts of a video related to the issue of chocolate slavery. The video is titled “Tony and the Chocolate Factory” and it is filmed in Ivory Coast and Ghana, where cocoa farmers are filmed expressing their experience with the chocolate industry and then with Tony’s Chocolonely [Blom et al., 2014].

“I am Kam Sami Felix. I am 16 years old. I worked on a cocoa plantation from 1999 until 2003. We were with 500 people on the plantation. I did not get paid and I was forced to work. I was not allowed to leave the plantation. We got food only once a day. The food was not good and we became very skinny. If you did not work, you were beaten. Once I had a stomach ache, but I still had to work. They hit me again. We were not allowed to contact each other. I also wasn’t allowed to talk to family.” [Blom et al., 2014]

“My name is Kingsley. I am the chair of the cooperative ABOCFA, in a small village in Ghana called Aponoape. There are 350 cocoa farmers in this cooperative. Due to the demand of Abroni (white person), my farmers worked very hard for years to become the first organic and Fairtrade certified cooperative in

Ghana. But once our beans were certified, Abroni did not want them anymore. My farmers were miserable, left with a lot of organic, Fairtrade cocoa beans that did not give them a higher price. This sad feeling affected everyone in Aponoape. I was very skeptical when Tony’s team offered us a long-term agreement in which they offered to buy our beans for a higher price. But Tony’s team kept their promise: we sold our first 30,000 kilo of cocoa beans to them! I look forward to Tony’s next visit in August, as they are going to help us grow and strengthen the cooperative and the village. My farmers are slowly regaining their motivation and trust. I know I am!” [\[Blom et al., 2014\]](#)

The emotive language is clearly observable, as it encompasses the subjective experiences of two people that represent the target demographics. Quite importantly, the stories also present contrasting emotions, which further emphasise the role that the social venture had on their well being. The first quote focuses on the issues they have and the problems with the industry, as a whole, containing sentences that induce intensely negative emotions such as “We got food only once a day” and “I also wasn’t allowed to talk to family”. The second quote continues with the negative emotions, but, halfway through, starts showing the benefits of collaborating with Tony’s Chocolonely. On the other hand, while the intensity of the quantitative language is significantly lower than in the fictional stories of the experiments, some numbers are still present (“500 people on the plantation”, “350 cocoa farmers”, “30,000 kilo of cocoa beans”). As this was not a pitch, but a narrative addressed to potential consumers, the metrics of financial success were not relevant, but the quantitative language was not altogether absent.

What must be mentioned about this specific venture is the general appeal to emotions. Their claim is the attempt to make chocolate 100% slave free, which is extremely vague and there is no direct, intuitive metric for it. Moreover, recently the American organisation Slave Free Chocolate has removed Tony’s from the list of ethical chocolate ventures due to its collaboration with Barry Callebaut [\[rtl nieuws.nl, 2021\]](#). This is important, as it is actually

Barry Callebaut that provides the raw material for the chocolate in Tony's Chocolonely and they have no claim of their products being slave free. Thus, we can observe just how important emotional marketing and emotive language is in the perception of reputation and in brand building.

7.2 Implications

The results of this study have several practical implications for social entrepreneurs. The findings point to the fact that social entrepreneurs must pay special attention to their stories constructed and communicated to various stakeholders. Those narratives have the potential to play a crucial role in the relationships with important stakeholders. The focus is on perspective clients, but the findings are equally applicable to investors, volunteers and consumers. Firstly, it is important for social entrepreneurs to acknowledge that storytelling is important and the quality and the components of the story have the potential to vastly change the consumer perspective and the decisions taken when interacting with the social venture. Narratives have the ability to persuade stakeholders in important ways, but in subtle methods. This indicates that entrepreneurs should focus on the emotions conveyed through stories and incorporate such emotive stories into all levels of organisational communication.

Furthermore, the results suggest that stories should not express only objective data and metrics, but should express subjective feelings of the demographics and the social target of the venture. Going even further, the analysis pointed to the fact that people preferred such subjective and emotive stories that contained no metrics over the narratives that only showed such metrics, even if the difference was marginal. Nevertheless, this specific hierarchy might not hold in front of investors for which the presence of quantitative language in a presentation, story or pitch is a definite necessity. Objective data and quantitative measures of impact, regarding both economic and social value, have their merits and their benefits go vastly beyond shaping consumer decisions. However, emotional narratives are not produced solely with metrics and data measures, but the highest impact is obtained when both are

intertwined and coherently integrated.

Ultimately, the conclusions of this research are somewhat dim, as metrics, transparency and correct expectation management are seen as merely beneficial, but not necessary. Quantitative language and aspects pertaining to rationality are put on a second place in comparison to the emotions and the role of the emotive language and expression. In light of the limited resources that social ventures have, this has a considerable impact on personnel acquisition and resource allocation. Metrics are difficult to set and must be constantly maintained or updated, data has to be analysed and validated continually, results must be expertly presented and understood. This puts enormous pressure on businesses that have to hire data analysts and experts, when the alternative is using the services of a copywriter on a project basis. Not only this alternative puts less financial and managerial pressure on companies with traditionally low capital and resources, but it is the only one which has been shown to bring significant benefits, which makes it the better alternative in terms of results. Other studies concerning entrepreneurial narratives are in accord with this conclusion, as it is pointed that, firstly, emotion is more impactful, and secondly, stories with characters increase purchase willingness [Roundy, 2014] [Roos, 2020]. Moreover, the salaries of data analysts and STEM majors tend to be higher than those related to marketing and communication [Taylor, 2016]. As such, when faced with scarce resources and the obligation of focusing on only one type of narrative, companies may take the 'easy way out' and present an extremely well written emotive story, absent of any quantitative information.

7.3 Limitations and Future Research

As with most quantitative methods, data size was a hindrance, even if it was sufficient for the analysis. A mock example with the exact same data repeated ten times made every previously shown t-test statistically significant at a 95% confidence interval. A pertinent hypothesis would be that a larger sample size could have produced similar averages, with the same hierarchy, but with a very different statistical significance. In particular, age was

segmented into two categories post-hoc, based on visual analysis only. In the theoretical mock example, the variation would have been extremely significant ($p\text{-value} < 0.00001$) and there would have been enough observations for a more accurate segmentation by age. Moreover, the other control variables that were excluded due to low count per segment could be included in the main analysis, with the potential of making a significant impact. If the data size issue is solved, future research could look at longitudinal analysis and replicate the same study in different years, in order to have a dynamic perspective on the trends in the perspective on social ventures.

A different limitation was the complexity of the model. The aim of the study was to have a parsimonious approach to the general concepts of emotion and rationality, focusing on the relation between the two and a mediation for sex in case of one of them. As such, the model simplicity allowed for very transparent and direct results, but at the cost of having a reductionist approach and missing on important drivers. The fact that much of the information and difference is not explained is clearly observable in Subsection 6.6, where the R-squared is below 5%, meaning that 95% of the explainable information is still contained in other variables. Future research could start by incorporating political ideology, as well as religion and spirituality as additional variables of analysis. Religious people seem to be very willing to donate to religious charities, but they appear to be less interested in engaging with hybrid ventures [Bekkers and Wiepking, 2011]. There is slight qualitative evidence that liberals and people who identify with a neo-liberal political ideology show a higher desire to support entrepreneurial ventures and engage in entrepreneurial philanthropy [Harvey et al., 2021]. Finally, previous awareness and interaction with social ventures was not accounted for.

The type of hybrid social venture was ultimately not analysed. Building on the segmentation explained in Subsection 8.1, there is a generally accepted way to categorise social businesses depending on who the clients and their beneficiaries are. The stories in the experiment were fictional attempts to match different types of hybrids, but it was decided that

there was not enough information relayed through the narratives and the differences couldn't be accurately quantified. In line with this, it is still unknown if the problem expressed in the narrative should be referred to in a general way, such as slave labour or poverty, or through the eyes of beneficiaries [Roundy, 2014]. Generalities would be expressed through quantitative language, whereas particular subjective stories will be told through emotive language. This probably changes with regards to the level of contingent value spillovers and degree of overlap between clients and beneficiaries, thus the generality of the story and the type of hybrid should be interconnected.

Regarding narratives and storytelling techniques, the complexity of those is difficult to contain in text only. Companies use a wide array of media, channels and technologies for marketing purposes, the texts alone being, at most, the core of their story. Just as films have the potential to go beyond books in involving visual aspects, motion and sound, so do stories evolve through additional means [Arnold and Eddy, 2007]. Even AI algorithms are becoming increasingly complex and they are getting better at moving back and forth from written text to images in creating compelling and coherent visual stories [Huang et al., 2016]. As such, the current study was limited to text alone, but future research could incorporate several other dimensions of presentation and analyse each of their contribution individually, as well as their interactions. It is clear that learning information is significantly easier and faster when accompanied by visual displays rather than text alone, thus the quantitative dimension of storytelling interaction will probably be enhanced too [Angeli and Valanides, 2004] [Schnotz, 2002]. It is for future studies to determine if the emotive language will follow suit and to what degree is it beneficial in the particular case of social ventures.

7.4 Conclusion

The purpose of the study is to observe if elements within the realms of ration and emotion would bring an increased perception of the reputation of a social enterprise based on their stories, as well as how significant his impact would be and the hierarchy between the two.

Quantitative language and emotive language were used in various combinations and intensities within fictional narratives in order to assess their influence. Moreover, the analysis looked at sex and how this may impact the way emotional stories are felt differently.

The first hypothesis looked at ration alone and postulated that a story with an increased level of quantitative language would have beneficial results. While the perceived reputation was indeed higher in the presence of quantifiers, the difference is insufficient statistically, so we cannot say that the variation is significant. Thus, social entrepreneurs cannot rely on simply transmitting metrics of their success and social impact if they want their companies to have a high reputation.

The second hypothesis assumed that emotion is the main driver of a story and the presence of emotive language would positively shift the perception of consumers. This hypothesis found significant support, both in the absence of quantitative language and in the presence of it, which shows that emotion can be regarded as the main driver in reputation perception. When creating a story for their company, social entrepreneurs must be sure to invest resources into emotionally expressing their struggles, as well as their successes.

The third hypothesis looked at the hierarchy between emotion and reason and posited that emotive language has a significantly superior impact to quantitative language. This assumption was not sustained, even if emotional stories scored higher than rational ones. This is mainly due to the fact that the presence of metrics in the texts had a positive effect, even if not statistically significant, and thus the presence of emotive language did not increase the perception score sufficiently high. This suggests that a strict hierarchy between the two is not necessarily beneficial to the story.

Conversely, an interesting result was the fact that the highest score was attained when the story contained both high levels of rationality and emotion, as it combined quantitative and emotive language, within the same narrative. This result is seen in item 2 of Table 11, Subsection 8.4. Readers were shown data, statistics and quantifiers, as well as emotive language with high impact words and visual descriptions of the problems they are trying

to solve. This combination was by far the best outcome in terms of reputation perception, which leads to the idea that quantitative language and emotive language have the highest positive effect when being both implemented in the same story. Thus, entrepreneurs should find a way to incorporate them both harmoniously, rather than make a hierarchy between the two. However, if the choice has to be done, the entrepreneurs should focus on the emotional part, as it is the one with a significantly higher effect.

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8 Appendix

8.1 Hybrid Ventures

The two key dimensions on which social businesses can be segmented are those of level of contingent value spillovers and degree of overlap between clients and beneficiaries, and they form the basis for classifying social business hybrids, further described in detail [Santos et al., 2015], as can be seen in Figure 6. Depending on what focus they have, hybrid social ventures can be allocated into four separate areas of focus: market, bridging, blending and coupling.

Dimensions	Clients = Beneficiaries	Clients $\neq$ Beneficiaries
Automatic Value Spillovers	MARKET HYBRID <i>Examples: BOP initiatives for access to basic services (energy, health)</i>	BRIDGING HYBRID <i>Examples: integrated business model with job matching for people with disabilities</i>
	Risk of Mission Drift: Low	Risk of Mission Drift: Intermediate (lower risk for more integrated models)
	Financial Sustainability: Easy	Financial Sustainability: Moderately Difficult
Contingent Value Spillovers	BLENDING HYBRID <i>Examples: Microfinance, integration models that require regular support or change of behavior for value to be created</i>	COUPLING HYBRID <i>Example: Work integration social enterprises that require a dual value chain that serves both clients and beneficiaries</i>
	Risk of Mission Drift: Intermediate	Risk of Mission Drift: High
	Financial Sustainability: Moderately Difficult	Financial Sustainability: Difficult

Figure 6: Social Business Segmentation [Santos et al., 2015]

Market hybrids are structured such that spillovers are automatic, without the requirement of interventions, and the beneficiaries are clients that require the goods or services provided. Such hybrids are fundamentally similar to pure commercial models, with the difference that that the organisation adopts a social mission. Similarly, blending hybrids

are entities that serve clients who are also the beneficiaries; however, achieving the desired impact requires blending commercial activities with additional interventions (such as community outreach, training or simply cash transfer) and the spillover of social value depends on these activities to happen. This type of hybrid includes microfinance, education and social inclusion organisations that require changes in behaviour on the part of clients for impact to happen. As such, blending hybrids have a higher risk of mission drift than market hybrids do, because the additional activities required to generate impact do not contribute to generating revenues and thus have a negative impact on profits, facing the risk of being neglected. Since bridging hybrids separate clients from beneficiaries into different entities, they must connect these groups and bridge the needs and resources of both constituencies. The difficulties faced by this type of social venture is that the business model has to integrate clients and beneficiaries in the same flow of activities. A useful business model innovation that may achieve this is that of complementary needs matching. Lastly, coupling hybrids also have clients and the beneficiaries that are different, but the value spillover does not happen automatically, requiring separate social interventions alongside the commercial operations. Coupling hybrids are the most difficult and complex type of hybrid to manage: not only do they need to serve two different types of constituencies with competing goals, but their social impact is also dependent on additional interventions that are not included in the provision of their main commercial activities. Such business models are quite demanding for organisational leaders because they need to constantly balance the demands of both their attention and resources, which are in constant competition, thus increasing the risk of mission drift [Santos et al., 2015]. Figure 6 summarises the segmentation of social businesses.

Although previously rarely considered in combination, business model innovation and mission drift are related, as radical strategic changes to the business model innovation can represent a drift from the initial mission, although business model innovation in social businesses is often necessary in order to adapt to the changing environment [Grimes et al., 2019]. When a business model innovation is perceived as a mission drift by employees or outside

evaluators, this might threaten legitimacy as a social business or might decrease stakeholder support. However, recent studies regarding the risk of mission drift are mostly conceptual and lack empirical grounding, except for few studies [Davies and Doherty, 2019]. Aside from the main reason for mission drift, which is the desire for revenue, there are multiple other reasons for it, such as the change in staff, change in the targeted demographic or the shift of focus to a new social goal, as well as various political and societal reasons.

8.2 Pre-Test Analysis and Discussion

Following the previous discussion on the pre-test, a more profound analysis was done with the purpose of further validating the claim that the questions are correctly mapping the required intensity and segmentation of the variables. The initial number of respondents is 85, aggregated for all cases. After the data was cleaned for incorrect or incomplete surveys, the resulting data points amounted to 27 for the LR.LE case, 27 for the LR.HE case and 27 for the HR.LE case. The equal number of observations was not targeted for, but it nevertheless makes comparison easier and more direct. Except for this cleaning, the data was not altered, transformed or manipulated in any way.

Figure 7 shows the distribution of the data points, for each case and for each of the two questions, as well as the means shown as the red horizontal line. It can be observed that the aggregations are correct for the cases with either high emotion or high ration, as the graphs for LR.HE.E and HR.LE.R show consistently high values, whereas LR.HE.R and HR.LE.E tend to show lower values. In particular, the difference between the means for reason and emotion is graphically observable for LR.HE and HR.LE, which is desired for. Conversely, the means for the LR.LE case are similar, which, in turn, is desired for, as there should be no perceived hierarchy between reason and emotion for this case.

Table 8 shows the result of the t-tests that analyse the means of the cases and the specific answers. The tests are one-sided, with the alternative hypothesis being that the group with the higher mean is expected to be significantly higher, as shown on column Alternative H.

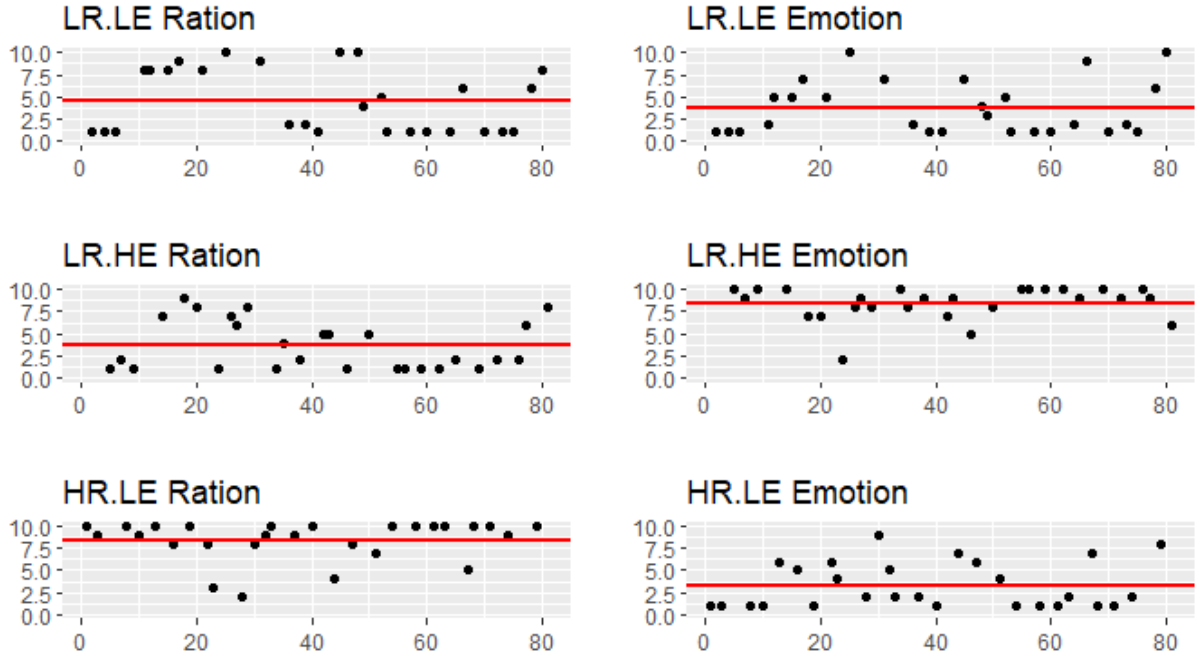


Figure 7: Case Distributions

Item	Alternative H	t-value	df	p-value
1	LR.HE.E > LR.LE.E	-6.915	43.63	<0.001
2	LR.HE.E > HR.LE.E	-8.421	47.36	<0.001
3	HR.LE.R > LR.LE.R	-4.642	44.01	<0.001
4	HR.LE.R > LR.HE.R	-6.848	49.98	<0.001
5	LR.HE.E > LR.HE.R	-7.409	45.32	<0.001
6	HR.LE.R > HR.LE.E	-7.730	51.23	<0.001
7	LR.LE.R > LR.LE.E	-0.935	50.28	0.1769

Table 8: T-test Pre-test

Here we pairwise compare different sets of observations in order to see if the variation in means is statistically significant. The benchmark for having such a result would be a p-value of 0.05 or lower. Is it noticeable that the p-value of items 1-6 is very low, showing that the alternative hypotheses pass with very high confidence. Conversely, item 7 shows a p-value

that is much larger than 0.05, which means that the null hypothesis is accepted.

The first two items check if the emotion in the HE cases is felt statistically higher than in the LE cases. In both comparisons the p-value is extremely low, which means that we accept alternative hypothesis that LR.HE.E is greater than both LR.LE.E and HR.LE.E. This implies that people feel a significant difference between stories with a high implied level of emotion and a low implied level of emotion. As such, the operationalisation of the emotion variable is correct and well perceived empirically.

The following two items check if the rationality in the HR cases is felt statistically higher than in the LR cases. In both comparisons the p-value is extremely low, which means that we accept alternative hypothesis that HR.LE.R is greater than both LR.LE.R and LR.HE.R. This implies that people feel a significant difference between stories with a high implied level of rationality and a low implied level of rationality. As such, the operationalisation of the rationality variable is correct and well perceived empirically.

Items 5 and 6 analyse if people are able to distinguish between the intensity of the two variables in the same case, in a context where one is at an pre-assumed high level and the other at an pre-assumed low level. As such, the means of the perceived rationality and emotion are compared for the LR.HE and HR.LE cases. Firstly, the mean for emotion is significantly higher than the mean for rationality in the LR.HE case. Secondly, the mean for rationality is significantly higher than the mean for emotion in the HR.LE case. This means that people are able to distinguish between the two variables and accurately make a hierarchy of their intensities when the level of pre-assumed intensity is different. As such, the operationalisation of the intensities of rationality and emotion is distinguishable at different intensities of expression.

Lastly, item 7 looks to confirm if people associate the same level of intensity of expression for both variables in the same case if the pre-assumed level of intensity is the same. The t-test involves the answers for the LE.LR case and analyses if the means for rationality is different than the one for emotion. Given that the mean for rationality is higher than the

one for emotion ($4.59 > 3.74$), the test remains one-sided, with the alternative hypothesis being $LR.LE.R > LR.LE.E$. The p-value in this case is not below the benchmark of 0.05, which implies that the means are not significantly different. This results in the fact that people perceive that both variables have the same level of intensity if the pre-assumed level of intensity is also the same. As such, the operationalisation of the intensities of rationality and emotion is indistinguishable at equal intensities of expression.

Hence, the pre-test have examined if the fictional stories and the operationalisation of the variables accurately map the way people perceive the variables and their intensities. There is statistically significant evidence that people are able to perceive HE cases as being more intense emotionally than LE cases. Furthermore, there is also statistically significant evidence that people are able to perceive HR cases as being more intense rationally than LR cases. Moreover, it can easily be distinguished between the intensity of variables when one of them is intense and the other isn't, such as in LR.HE and HR.LE. Finally, people associate the same level of intensity with both variables in the case LR.LE, where both operationalisations had a pre-assumed level of low intensity. This all leads to the fact that the operationalisations are correct and the stories of the experiment are well built for the current analysis. In conclusion, quantitative language and emotive language are well expressed in the stories, as well as their intensities, and they accurately map the general concepts of rationality and emotion.

8.3 Experiment Data Analysis

8.3.1 Data Cleaning

The data was downloaded from Qualtrics into a CSV format on the local machine. In order to have the highest level of reproducibility, no CSV/Excel manipulation was done and the raw data was loaded to R and further cleaned and analysed. Within R, a modular scripting structure was optimised, such that the tasks would be easy to segment. The full code can be observed in Subsection [8.7](#)

A series of conditions was imposed for keeping participant data. First of all, the respondents which did not give pass the correct answer for the attention check were excluded, thus significantly decreasing the bias that would have come from lack of attention. Afterwards, the answers that were marked as either not finished or which did not progress to 100% were excluded, as this would have lead to an imbalance in data size. Moreover, none of the uncompleted experiments reached the point of attention check, so it can be assumed that the respondents were not paying enough attention. Lastly, one respondent did not agree to the initial request for consent, so the entry was deleted. In total, 21 data entries were deleted after the initial cleaning, leaving a total of 117 responses to be analysed. The responses were segmented in 56 data points for the low emotion case and 59 for the high emotion case. The dataset contains 6 observations where the gender is not completed. For these, the option "Other" was synthetically opted for, instead of removing the observations, given that the first three hypotheses are not linked to sex in any way. Throughout the analysis, the numbers are capped to a maximum of 3 relevant decimals, with the potential trailing 0 kept for symmetry in tabular input.

In order to have the data in a numerically analysable structure, the answers were mapped to their respective numbers in the Likert scale, 1 being "Strongly disagree" and 7 being "Strongly agree". The numbers are averaged per each respondent for each question. Afterwards, the resulting numbers from questions are averaged again for the respective case. This way, the questions are aggregated per each combination of the two levels of ration and emotion, thus obtaining two variables which form the focal point of analysis.

8.3.2 Normality

In Table 9 we can see the main moments of the raw distribution. It is noticeable that the means are in increasing order, as expected according to the hypotheses. In terms of volatility, the low emotion group is much more volatile than the high emotion group, with the LR.LE having almost double the standard deviation (s.d.) of the LR.HE group. The

	LR.LE	HR.LE	LR.HE	HR.HE
mean	4.78	5.07	5.32	5.47
s.d.	1.55	1.172	0.88	0.89
skewness	-1.21	-1.19	-0.32	-0.34
kurtosis	3.42	4.89	2.49	2.66
SW	<0.001	0.001	0.33	0.098
JB	<0.001	<0.001	0.431	0.487

Table 9: Moments - Raw Data

desired skewness for a distribution is to fall between the interval $(-0.5, 0.5)$ in order to assume normal skewness. All groups have negative skewness, with the HE group showing only slight deviations and the LE group exhibiting significant negative skewness. Thus, there are vast differences between the cases and they do not show a Gaussian skewness. In terms of kurtosis, both cases of the HE group are slightly platykurtic, LR.LE is slightly leptokurtic and HR.LE is significantly leptokurtic. The desired interval for kurtosis, in order to assume normality, would be $(2, 4)$. As such, the HR.LE case fails this assumption and the distribution is regarded as having too much kurtosis.

The Shapiro-Wilk (SW) test for normality is optimised for data with a low number of observations, such as the one in question [Razali et al., 2011]. This test is particularly sensitive to variations in skewness and kurtosis, as it is a non-parametric test which observes the hierarchical rank of each data point and if it matches what a normal distribution would look like. A p-value lower than 0.05 points to the fact that the distribution is not normal, as it refutes the null hypothesis that the data is Gaussian. Table 9 reports the p-values of the test. Naturally, these skewness and kurtosis deviations lead to the fact that both LR.LE and HR.LE fail the Shapiro-Wilk normality test.

In order to further analyse the normality of the data, the Jarque-Bera (JB) test is also

used [Jarque and Bera, 1987]. It is a test for normality that has a χ^2 distribution under the null hypothesis and it only analyses the skewness and the kurtosis of the data. As per the usual standard of confidence intervals, p-values lower than 0.05 point to the fact that the distribution is not normal, as it refutes the null hypothesis that the data is Gaussian. Table 9 reports the p-values of the test and we can observe that the deviations from a normal skewness and kurtosis of both LR.LE and HR.LE label their distributions as significantly far from the normality assumptions.

In order to address the issue of significant negative skewness, the data must undergo a Box-Cox transformation in order to reduce the skewness difference and normalise the data [Abbasi et al., 2011]. Thus, the data follows a simple Box-Cox transformation of the following form:

$$data_{new} = \frac{(data_{raw})^3 - 1}{3}.$$

	LR.LE	HR.LE	LR.HE	HR.HE
mean	50.351	53.131	58.551	62.917
s.d.	27.651	26.042	23.398	25.928
skewness	-0.324	0.020	0.220	0.208
kurtosis	2.246	2.329	2.282	2.428
SW	0.047	0.739	0.384	0.113
JB	0.328	0.602	0.418	0.540

Table 10: Moments - Normalised Data

As we can observe in Table 10, the data has a more harmonious and normal aspect. The ratio between the most volatile (LR.LE) and least volatile (LR.HE) dropped from the initial 1.76 to 1.18, which makes the standard deviations more similar and easier to interpret. Moreover, this further enhances the homoskedasticity of the distributions. Skewness is enclosed

by the interval $(-0.35, 0.25)$, which reveals that neither distribution shows significant signs of skewness and they stand close to the desired expectation of normality. The kurtosis deviation is significantly decreased and is much more balanced between the distributions. While still being platykurtic, the variations between cases are minimal and it is regarded that there is no significant deviation from the normal mesokurtic distribution. By the Jarque-Bera, all cases pass the test and are regarded as normal. With regards to the Shapiro-Wilk test, all cases except LR.LE pass the test at 5% confidence. The negative outliers in the LR.LE distribution still affect the normality of it, even after the transformation. Nevertheless, the difference in p-value is minor and the case does pass the JB test. Hence, it is considered sufficiently close to a Gaussian distribution from here onwards for the purpose of the current analysis.

Figure 8 show the Q-Q plot of all cases. The Q-Q plot (quantile-quantile) is a graphical way to observe if a distribution is normal or not. The quantiles of each distributions are compared to the benchmark in order to see if the mapping is similar. In this case, the benchmark is chosen as the normal distribution, such that the horizontal axis has the normal quantiles and the vertical axis has the quantiles of each case. As such, the closer a distribution is to a normal one, the more similar to a line the plot will look like. The plots present a blue line, representative of a perfect normal distribution, as well as dotted blue lines, representative of the 95% confidence interval. We can see that the cases map the normal distribution quite well, including the LR.LE case, as all values are within the confidence interval. As such, we again conclude that the distributions of all cases are sufficiently close to a Gaussian one for the current analysis.

8.4 Post-hoc analysis

Figure 9 shows the average score for each age, as well as the line of best fit in red with its 95% confidence interval. We can observe that there is a slight upwards tendency from the age of 30 onwards, but there is no clear trend. Moreover, there are several outliers, such as

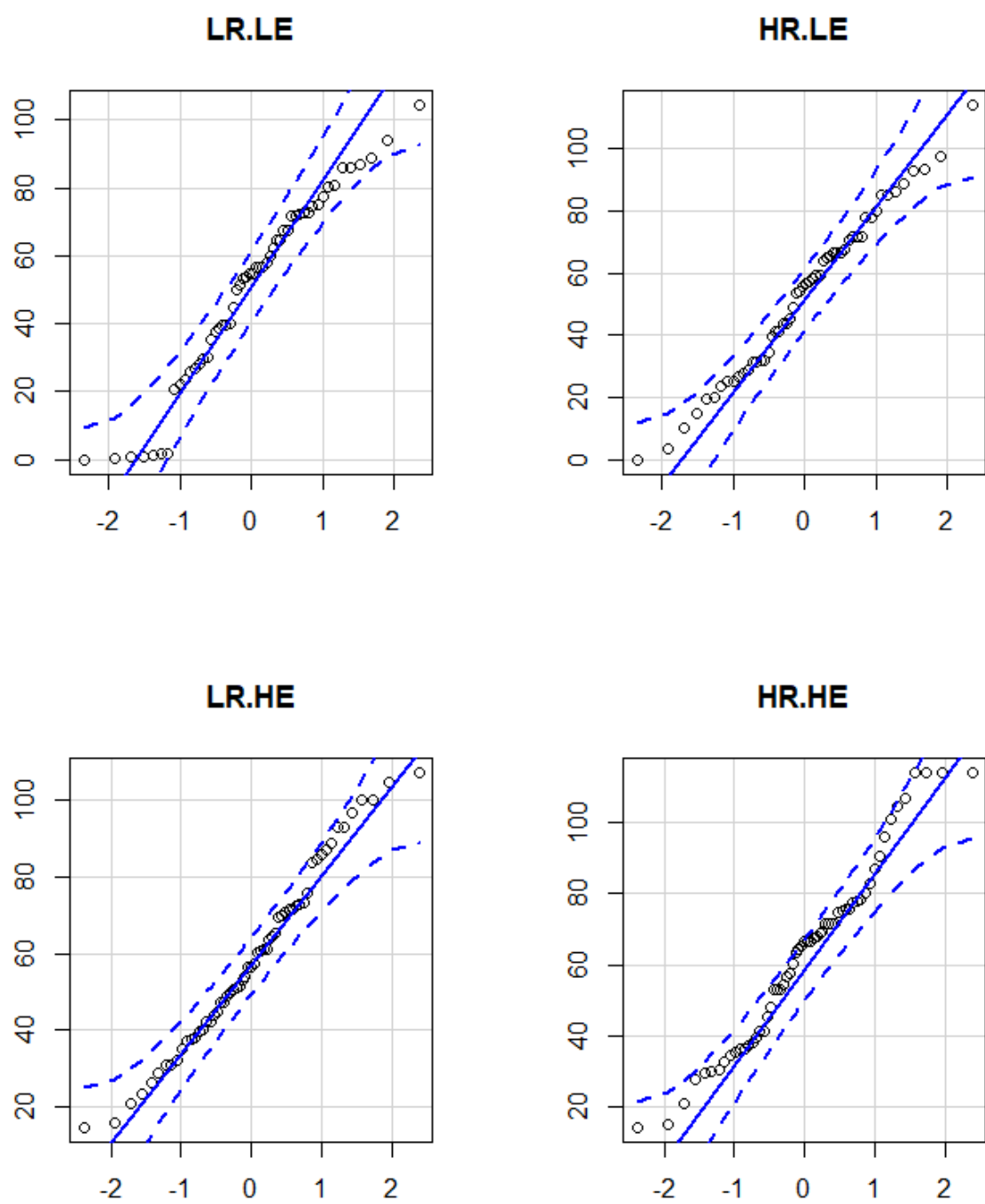


Figure 8: QQplot

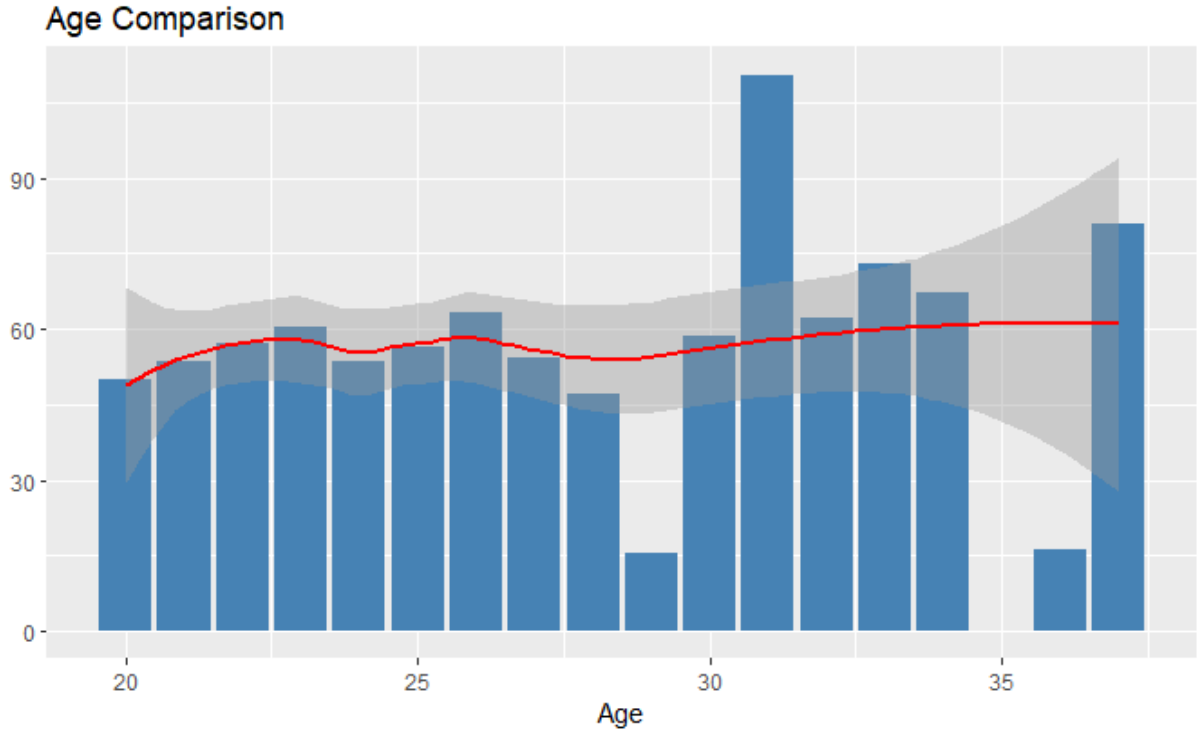


Figure 9: Age Comparison

the low score for age 29 and the very high one for age 31. The age groups were segmented as young (age up to 29 years old), with 94 data points and an average of 55.46, and mature (age from 30 years old onwards), with 13 observations and an average of 65.07. One observation of age 17 was excluded from the analysis, as it was considered that financial decisions are limited to adults only.

Item	Alternative H	t-value	df	p-value
1	Mature > Young	-1.295	14.85	0.107
2	HR.HE > LR.LE	-2.485	108.44	0.007
3	Wealthy > Unprosperous	-0.288	89.54	0.386
4	No_Degree > Degree	-0.022	166.72	0.490

Table 11: T-test Ad-hoc

Table 11 shows the statistical results of the test implying analyses other than these found in the hypotheses. The first item looks at the statistical analysis of the t-test done

between the mature and young respondents, with the alternative hypothesis being that the average for the matures is significantly higher than that of younger people. The p-value of 0.1075 is far from the benchmark of 0.05, thus we refute the hypothesis that the difference is significant. Nevertheless, we note that the p-value is relatively low and the difference in means is consistent, prompting for the potential for future research into this topic.

Item 2 looks at the difference between the extreme cases (HR.HE and LR.LE) and compares the means. The very low p-value shows that there is plenty of statistical evidence to show that the mean of the HR.HE case is larger than that of LR.LE. We note again that the mean of the HR.HE case is the highest of all cases and we also observe that the p-value of this t-test is the lowest. Ultimately, this means that the combined effect of quantitative and emotive language has the highest and most consistent impact on how people perceive social ventures.

Item 3 analyses the variation of score between different levels of income. People who have a net annual income of less than 25000 euros are labelled 'Unprosperous', totalling 46 observations, whereas the others are labelled 'Wealthy', amounting to 50 data points. 21 data instances were removed due to either information not being filled in or the respondents not being willing to disclose such information. The average for Wealthy is slightly higher than for Unprosperous ($57.26 > 55.86$), but the difference is not meaningful enough to render this variation statistically significant.

The fourth item evaluates the way scores change depending on education. Respondents which completed a university degree are labelled 'Degree', numbering 87 observations with a mean of 56.45, whereas the others are labelled 'No_Degree', having only 23 data points and averaging 56.53. As already observable, there is no potential for a statistically significant variation, given that the means are too similar. The p-value follows suit, as the rather large value point to no meaningful difference. Interestingly, the two subgroups that aggregate into the Degree group have very different means, with undergraduates numbering 53 people with an average of 58.31 and postgraduates having 34 observations with a mean of 53.47. This

non-linear trend further enhances the idea that no notable insight can be obtained from observing education in the current dataset.

8.5 Pre-test

8.5.1 Plain (LR.LE)

The company Sustainable Water creates portable water purification devices. They sell their devices for a modest profit in developing countries which have poor access to clean water. The costs are much lower than the equivalent for bottled water, which allows people cheap access to the water they need.

The CEO states that: “We saw that there is a need for this, so we acted on it. We have sold many water purifiers in several countries, which helped people. So far, many people have used our products and we plan to continue with this. Our plans are to expand into more countries and create more products.”

8.5.2 Emotive Language (LR.HE)

Company Clean Dough hires ex-convicts to bake bread. The operations are structured like most bakeries and their goods lean on the premium side. The ex-convicts benefit from having a job, both through the income they receive and from the social context they have.

The CEO states that: “Our purpose is to reduce criminality and to integrate people in the society. We know that unemployment is the most important factor in reconviction. It saddens us to see that these unlucky people can no longer live happy and fulfilling lives! Our company has employed many amazing people over two years, time in which reconviction rates have fallen. It is truly inspiring to see such wonderful people transition to house-owners and family people. We are a profitable company, but our ultimate goal is to see the smile on the faces of our employees.”

8.5.3 Quantitative Language (HR.LE)

The company Blue Light trains women in developing countries to create affordable light resources. The courses cost an affordable sum of money and this constitutes the revenue

of the company. After being trained, the women become entrepreneurs themselves and sell affordable light sources from recycled materials.

The CEO states that: “We considered that affordable light is beneficial to the 200 million people in developing countries that lack such facilities. So far, we have trained over 10.000 women in Uganda, Kenya and Tanzania to create affordable light resources. They have sold approximately 570.000 solar lanterns and made a profit of 1.27 million dollars. Throughout this endeavour, we have had a total revenue of 1 million dollars, which allows us to expand new countries.”

8.5.4 Question

How did you perceive the story? (Likert 1-10)

1. I believe this story to be rational.
2. I believe this story to be rational.

8.6 Experiment

8.6.1 Plain (LR.LE) 1

The company Sustainable Water creates portable water purification devices. They sell their devices for a modest profit in developing countries which have poor access to clean water. The costs are much lower than the equivalent for bottled water, which allows people cheap access to the water they need.

The CEO states that: “We saw that there is a need for this, so we acted on it. We have sold many water purifiers in several countries, which helped people. So far, many people have used our products and we plan to continue with this. Our plans are to expand into more countries and create more products.”

8.6.2 Plain (LR.LE) 2

Company New Sight employs blind servers to cater to blindfolded people. New Sight acts as a normal restaurant where people come to dine with the additional experience of being blindfolded. The visually impaired people benefit from being employed, as well as from the fact that awareness is increased.

The CEO states that: “We started this company knowing that there would be few resource requirements. Our visually impaired employees work well and have proved to be good employees. The fact that we hired them really benefited our company. We feel that we did good and did it well. “

8.6.3 Quantitative Language (HR.LE) 1

The company Good Sleep designs and sells affordable tents for homeless people. Good Sleep commercialises not only tents, but also other accessories for sleeping, such as blankets and pillows, with a focus on durability and cost-effectiveness. People without a house get access to their own places where they can sleep.

The CEO states that: “Housing is prohibitively expensive and it is difficult to obtain social housing. Up to 65% of the homeless people state that the quality of sleep is their main issue for the more than 100 million people without proper housing. After using our products for only 3 months, 73% of the users found employment and 43% even found adequate housing. We look forward to seeing how their lives will keep on improving.”

8.6.4 Quantitative Language (HR.LE) 2

The company Blue Light trains women in developing countries to create affordable light resources. The courses cost an affordable sum of money and this constitutes the revenue of the company. After being trained, the women become entrepreneurs themselves and sell affordable light sources from recycled materials.

The CEO states that: “We considered that affordable light is beneficial to the 200 million

people in developing countries that lack such facilities. So far, we have trained over 10.000 women in Uganda, Kenya and Tanzania to create affordable light resources. They have sold approximately 570.000 solar lanterns and made a profit of 1.27 million dollars. Throughout this endeavour, we have had a total revenue of 1 million dollars, which allows us to expand new countries.”

8.6.5 Emotive Language (LR.HE) 1

The company Sustainable Water creates portable water purification devices. They sell their devices for a modest profit in developing countries which have poor access to clean water. The costs are much lower than the equivalent for bottled water, which allows people cheap access to the water they need.

The CEO states that: “We saw that people in poor countries need this, so it was imperative to act now! Imagine not drinking water for two days in the scorching sun... We felt that it is our responsibility to help. It is heartbreaking to see how some families suffer from not having what other take for granted! When we sold water purifiers in other countries we saw the faces lighten up. It’s those moments that make it worth it! We are constantly amazed to see how we have increased the quality of lives for so many innocent people! Our mission is to completely eliminate water scarcity worldwide. ”

8.6.6 Emotive Language (LR.HE) 2

Company New Sight employs blind servers to cater to blindfolded people. New Sight acts as a normal restaurant where people come to dine with the additional experience of being blindfolded. The visually impaired people benefit from being employed, as well as from the fact that awareness is increased.

The CEO states that: “Imagine never seeing anyone or anything ever again, imagine not seeing the flowers blooming in the spring... However unbearable it may seem, these people still tackle every day and live life to the fullest! Our visually impaired keep amazing us and

keep proving to the world the immense potential they have. We feel that we really made people aware of their difficulties as they walked in their shoes for a while. Our mission is to empower those who are seen as powerless by the society. “

8.6.7 Quantitative and Emotive Language (HR.HE) 1

The company Good Sleep designs and sells affordable tents for homeless people. Good Sleep commercialises not only tents, but also other accessories for sleeping, such as blankets and pillows, with a focus on durability and cost-effectiveness. People without a house get access to their own places where they can sleep.

The CEO states that: “It is enraging how little governments care about the homeless! Housing is prohibitively expensive and it is difficult to obtain social housing. Up to 65% of the homeless people state that the quality of sleep is their main issue for the more than 100 million people without proper housing. It is heartbreaking to imagine how someone is forced to sleep outside, in the cold, for weeks in a row. Imagine sleeping outside in the winter, crawling up on a bench, shivering throughout the entire night.... After only 3 months, 73% of those who tried it found employment and 43% even found adequate housing. We are amazed at the effects proper sleep has and we are excited to see the next steps we can take to help the society!”

8.6.8 Quantitative and Emotive Language (HR.HE) 2

The company Blue Light trains women in developing countries to create affordable light resources. The courses cost an affordable sum of money and this constitutes the revenue of the company. After being trained, the women become entrepreneurs themselves and sell affordable light sources from recycled materials.

The CEO states that: “We considered that affordable light is beneficial to the 200 million people in developing countries that lack such facilities. Imagine that your day ends at sundown for the rest of your life, how would you feel? We were shocked to see that millions

of people have no access to lighting and infuriated that no one does anything about it! So far, we have trained over 10.000 women in Uganda, Kenya and Tanzania to create affordable light resources. They have sold approximately 570.000 solar lanterns and made a profit of 1.27 million dollars, radically changing their own lives and that of everyone that purchased from them. Throughout this endeavour, we have had a total revenue of 1 million dollars; we believe that with every penny we make we get closer to further pursue our dreams and share the light with everyone.”

8.6.9 Question

How much do you agree with the following statements? (Likert 1-7 from 'Strongly disagree' to 'Strongly agree')

1. I believe this organization has a good reputation.
2. I believe this organization has a positive image.
3. I believe this organization is viewed favourably.
4. I believe this organization is admired.
5. I believe this organization is held in high esteem.
6. I would purchase from this company.
7. Select 'Disagree' if you are paying attention.

8.7 R Code

The version used is R version 4.1.2 (2021-11-01) – “Bird Hippie”.

8.7.1 Libraries

```
#START####LIBRARIES#####  
  
# load libraries  
  
library(tidyverse)  
  
library(forecast)  
  
library(lubridate)  
  
library(quantmod)  
  
library(dynlm)  
  
library(leaps)  
  
library(rugarch)  
  
library(climate)  
  
library(xlsx)  
  
library(tor)  
  
library(xgboost)  
  
library(caret)  
  
library(metR)  
  
library(pastecs)  
  
library(psych)  
  
library(devtools)  
  
library(mosaic)  
  
library(gridExtra)  
  
library(writexl)  
  
library(moments)  
  
library(ltm)
```

```

library(tseries)
library("grid")
library("ggplotify")
# library(Rtools)

#END####LIBRARIES#####

# install.packages("Rtools")

```

8.7.2 Pre-test

```

# set up working directory
setwd("C:/Users/user/Desktop/MASTER/Thesis MBA/Data")

# load libraries
source('0_libs.R')

# upload data
data <- read.csv("data_pretest.csv")

# data cleaning
data <- data %>%
  filter(Progress == "100") %>%
  filter(Finished == "1") %>%
  filter(Consent == "1")

```

```

# remove extra columns
data <- dplyr::select(data, -c(1:11, 18:20))

# rename columns
colnames(data) <- c("LR.LE.R", "LR.LE.E", "LR.HE.R", "LR.HE.E", "HR.LE.R", "HR.LE.E")

# make variables numeric
data <- as.data.frame( sapply(data, as.numeric))

# observe count
data %>% count(LR.LE.R)
data %>% count(LR.HE.R)
data %>% count(HR.LE.R)

data_plus <- data

# create vector for mean
data_plus[82,] <- 0
rownames(data_plus)[82] <- "mean"

# create row for standard deviation
data_plus[83,] <- 0
rownames(data_plus)[83] <- "sd"

```

```

# create row for skewness
data_plus[84,] <- 0
rownames(data_plus)[84] <- "skewness"

# create row for kurtosis
data_plus[85,] <- 0
rownames(data_plus)[85] <- "kurtosis"

# create row for shapiro wilins test
data_plus[86,] <- 0
rownames(data_plus)[86] <- "SW"

# create row for KS test
data_plus[87,] <- 0
rownames(data_plus)[87] <- "KS"

# create row for Jarque-Bera test
data_plus[88,] <- 0
rownames(data_plus)[88] <- "JB"

# set up points for numeric variables
start <- 1
end <- length(data)

# run loop to calculate the things above

```

```

for (i in start:end) {

  # i=11

  data_plus[82, i] <- mean(data_plus[1:81,i], na.rm = TRUE)
  data_plus[83, i] <- sd(data_plus[1:81,i], na.rm = TRUE)
  data_plus[84, i] <- skewness(data_plus[1:81,i], na.rm = TRUE)
  data_plus[85, i] <- kurtosis(data_plus[1:81,i], na.rm = TRUE)
  data_plus[86, i] <- shapiro.test(data_plus[1:81,i])$p.value
  data_plus[87, i] <- ks.test(data[1:81,i], 'pnorm')$p.value
  data_plus[88, i] <- jarque.bera.test(na.omit(data[1:81,i]))$p.value
}

```

```

# make plots for relevant data

```

```

mini <- data_plus[82:88,]

```

```

mini

```

```

q1 <- ggplot(data) +
  geom_point(aes(x = 1:81, y = LR.LE.R))+
  geom_hline(yintercept = mean(data$LR.LE.R, na.rm = TRUE), colour = 'red', size = 1) +
  ylab("")+
  xlab("")+
  ggtitle("LR.LE Ration")+

```

```
ylim(0, 10)
```

q1

```
q2 <- ggplot(data) +  
  geom_point(aes(x = 1:81, y = LR.LE.E))+  
  geom_hline(yintercept = mean(data$LR.LE.E, na.rm = TRUE), colour = 'red', size =1) +  
  ylab("")+  
  xlab("")+  
  ggtitle("LR.LE Emotion")+  
  ylim(0, 10)
```

q2

```
q3 <- ggplot(data) +  
  geom_point(aes(x = 1:81, y = LR.HE.R))+  
  geom_hline(yintercept = mean(data$LR.HE.R, na.rm = TRUE), colour = 'red', size =1) +  
  ylab("")+  
  xlab("")+  
  ggtitle("LR.HE Ration")+  
  ylim(0, 10)
```

q3

```

q4 <- ggplot(data) +
  geom_point(aes(x = 1:81, y = LR.HE.E))+
  geom_hline(yintercept = mean(data$LR.HE.E, na.rm = TRUE), colour = 'red', size =1) +
  ylab("")+
  xlab("")+
  ggtitle("LR.HE Emotion")+
  ylim(0, 10)

```

q4

```

q5 <- ggplot(data) +
  geom_point(aes(x = 1:81, y = HR.LE.R))+
  geom_hline(yintercept = mean(data$HR.LE.R, na.rm = TRUE), colour = 'red', size =1) +
  ylab("")+
  xlab("")+
  ggtitle("HR.LE Ration")+
  ylim(0, 10)

```

q5

```

q6 <- ggplot(data) +
  geom_point(aes(x = 1:81, y = HR.LE.E))+
  geom_hline(yintercept = mean(data$HR.LE.E, na.rm = TRUE), colour = 'red', size =1) +
  ylab("")+

```

```
xlab(""))+  
ggtitle("HR.LE Emotion")+  
ylim(0, 10)
```

q6

```
# aggregate plots  
grid.arrange(q1, q2, q3, q4, q5, q6, nrow = 3, top = "")
```

```
# t-tests  
  
t.test(data$LR.LE.E, data$LR.HE.E, alternative = c("less"))  
t.test(data$HR.LE.E, data$LR.HE.E, alternative = c("less"))  
  
t.test(data$LR.LE.R, data$HR.LE.R, alternative = c("less"))  
t.test(data$LR.HE.R, data$HR.LE.R, alternative = c("less"))  
  
t.test(data$LR.HE.R, data$LR.HE.E, alternative = c("less"))  
t.test(data$HR.LE.E, data$HR.LE.R, alternative = c("less"))  
  
t.test(data$LR.LE.E, data$LR.LE.R, alternative = c("less"))
```

```

# graph bar plot means
x <- colMeans(data, na.rm = TRUE)
bp <-barplot(colMeans(data, na.rm = TRUE),
             ylim=c(0, 10))
text(bp, x, signif(x,3), pos=3, offset = 1)
bp

```

8.7.3 Experiment

```

# set up working directory
setwd("C:/Users/user/Desktop/MASTER/Thesis MBA/Data")

# load libraries
source('0_libs.R')

# upload data
data <- read.csv("data_exp.csv")

# remove unfinished or unconfirmed responses
data <- data %>%

```

```

filter(Progress == "100") %>%
filter(Finished == "TRUE") %>%
filter(Consent == "I consent.") %>%
filter(B.LR.LE.Q_7 == "Disagree" || B.LR.LE.Q_7 == "" )%>%
filter(B.LR.HE.Q_7 == "Disagree" || B.LR.HE.Q_7 == "" )

# remove extra columns
data <- dplyr::select(data, -c(1:6))
data <- dplyr::select(data, -c(2:11))
data <- dplyr::select(data, -c(27, 52))

# replace words with numbers
data[data == "Strongly disagree"] <- "1"
data[data == "Disagree"] <- "2"
data[data == "Somewhat disagree"] <- "3"
data[data == "Neither agree nor disagree"] <- "4"
data[data == "Somewhat agree"] <- "5"
data[data == "Agree"] <- "6"
data[data == "Strongly agree"] <- "7"

# rename gender to sex
data <- data %>% rename(Sex = Gender)

# replace empty Sex with other

```

```

data$Sex[data$Sex == ""] <- "Other"

# observe count
data %>% count(Sex, sort = TRUE)

# make columns numeric
data[, c(3:51)] <- sapply(data[, c(3:51)], as.numeric)

# put all numeric data at the end
data <- relocate(data, where(is.numeric), .after = last_col())
data <- relocate(data, Age, .after = Emotion)

# apply transformation
start <- 11
end <- length(data)
for (i in start:end) {
  for (j in 1:117) {
    data[j,i] <- (data[j,i]^3-1)/3

  }
}

# calculate average of answers per type of question
data$M.LR.LE <- (data$M.LR.LE.Q_1 + data$M.LR.LE.Q_2+ data$M.LR.LE.Q_3+ data$M.LR.LE.Q_4
data$M.HR.LE <- (data$M.HR.LE.Q_1 + data$M.HR.LE.Q_2+ data$M.HR.LE.Q_3+ data$M.HR.LE.Q_4

```

```

data$B.LR.LE <- (data$B.LR.LE.Q_1 + data$B.LR.LE.Q_2+ data$B.LR.LE.Q_3+ data$B.LR.LE.Q_4
data$B.HR.LE <- (data$B.HR.LE.Q_1 + data$B.HR.LE.Q_2+ data$B.HR.LE.Q_3+ data$B.HR.LE.Q_4

data$M.LR.HE <- (data$M.LR.HE.Q_1 + data$M.LR.HE.Q_2+ data$M.LR.HE.Q_3+ data$M.LR.HE.Q_4
data$M.HR.HE <- (data$M.HR.HE.T_1 + data$M.HR.HE.T_2+ data$M.HR.HE.T_3+ data$M.HR.HE.T_4

data$B.LR.HE <- (data$B.LR.HE.Q_1 + data$B.LR.HE.Q_2+ data$B.LR.HE.Q_3+ data$B.LR.HE.Q_4
data$B.HR.HE <- (data$B.HR.HE.Q_1 + data$B.HR.HE.Q_2+ data$B.HR.HE.Q_3+ data$B.HR.HE.Q_4

# calculate average per case type
data$LR.LE <- (data$M.LR.LE + data$B.LR.LE)/2
data$HR.LE <- (data$M.HR.LE + data$B.HR.LE)/2
data$LR.HE <- (data$M.LR.HE + data$B.LR.HE)/2
data$HR.HE <- (data$M.HR.HE + data$B.HR.HE)/2

# calculate average per hybrid type
data$Market <- rowSums(data[,c('M.LR.LE', 'M.HR.LE', 'M.LR.HE', 'M.HR.HE')], na.rm=TRUE)
data$Other <- rowSums(data[,c('B.LR.LE', 'B.HR.LE', 'B.LR.HE', 'B.HR.HE')], na.rm=TRUE)

# calculate average for all
data$all <- (data$Market + data$Other)/2

# calculate the alpha for each set of questions
cronbach.alpha(data[,c(11:22)], na.rm = TRUE)
cronbach.alpha(data[,c(23:34)], na.rm = TRUE)

```

```

cronbach.alpha(data[,c(35:46)], na.rm = TRUE)
cronbach.alpha(data[,c(47:58)], na.rm = TRUE)

cronbach.alpha(data[,c(67,68)], na.rm = TRUE)
cronbach.alpha(data[,c(69,70)], na.rm = TRUE)

cronbach.alpha(cbind(na.omit(data[,c(67,68)]), na.omit(data[,c(69,70)]))[1:54,]))

# calculate correlation
corr.test(data$LR.LE, data$HR.LE)
corr.test(data$LR.HE, data$HR.HE)

## t test
# H1 - reason good
t.test(data$LR.LE, data$HR.LE, alternative = c("less"))
t.test(data$LR.HE, data$HR.HE, alternative = c("less"))

# H2 - emotion good
t.test(data$LR.LE, data$LR.HE, alternative = c("less"))
t.test(data$HR.LE, data$HR.HE, alternative = c("less"))

# H3 - emotion > reason
t.test(data$HR.LE, data$LR.HE, alternative = c("less"))

# extra
t.test(data$LR.LE, data$HR.HE, alternative = c("less"))

```

```

data_plus <- data

# cool way to calculate mean; deprecated
# mean = c(1:9, as.vector(colMeans(data[,10:68], na.rm = TRUE)))

# create vector for mean
data_plus[118,] <- 0
rownames(data_plus)[118] <- "mean"

# create row for standard deviation
data_plus[119,] <- 0
rownames(data_plus)[119] <- "sd"

# create row for skewness
data_plus[120,] <- 0
rownames(data_plus)[120] <- "skewness"

# create row for kurtosis
data_plus[121,] <- 0
rownames(data_plus)[121] <- "kurtosis"

```

```

# create row for shapiro wilins test
data_plus[122,] <- 0
rownames(data_plus)[122] <- "SW"

# create row for KS test
data_plus[123,] <- 0
rownames(data_plus)[123] <- "KS"

# create row for Jarque-Bera test
data_plus[124,] <- 0
rownames(data_plus)[124] <- "JB"

# set up points for numeric variables
start <- 11
end <- length(data)

# run loop to calculate the things above
for (i in start:end) {

# i=11

  data_plus[118, i] <- mean(data_plus[1:117,i], na.rm = TRUE)
  data_plus[119, i] <- sd(data_plus[1:117,i], na.rm = TRUE)
  data_plus[120, i] <- skewness(data_plus[1:117,i], na.rm = TRUE)
  data_plus[121, i] <- kurtosis(data_plus[1:117,i], na.rm = TRUE)

```

```

data_plus[122, i] <- shapiro.test(data_plus[1:117,i])$p.value
data_plus[123, i] <- ks.test(data[1:117,i], 'pnorm')$p.value
data_plus[124, i] <- jarque.bera.test(na.omit(data[1:117,i]))$p.value
}

```

```

#### save mini data ####

```

```

mini <- data_plus[118:124,67:70]

```

```

mini

```

```

#### CREATE PLOTS ####

```

```

# create each scatter plot with the mean included, then also plot it

```

```

q1 <- ggplot(data) +
  geom_point(aes(x = 1:117, y = LR.LE))+
  geom_hline(yintercept = mean(data$LR.LE, na.rm = TRUE), colour = 'red', size = 2) +
  ylab("")+
  xlab(("LR.LE"))+
  ylim(1, 120)

```

```

q1

```

```

q2 <- ggplot(data) +

```

```

geom_point(aes(x = 1:117, y = HR.LE))+
geom_hline(yintercept = mean(data$HR.LE, na.rm = TRUE), colour = 'red', size = 2) +
ylab("")+
xlab(("HR.LE"))+
ylim(1, 120)

```

q2

```

q3 <- ggplot(data) +
  geom_point(aes(x = 1:117, y = LR.HE))+
  geom_hline(yintercept = mean(data$LR.HE, na.rm = TRUE), colour = 'red', size = 2) +
  ylab("")+
  xlab(("LR.HE"))+
  ylim(1, 120)

```

q3

```

q4 <- ggplot(data) +
  geom_point(aes(x = 1:117, y = HR.HE))+
  geom_hline(yintercept = mean(data$HR.HE, na.rm = TRUE), colour = 'red', size = 2) +
  ylab("")+
  xlab(("HR.HE"))+
  ylim(1, 120)

```

q4

```

# plot the four plots in the same output

```

```
grid.arrange(q1, q2, q3, q4, nrow = 1, top = "Comparison")
```

```
#### analysis education ####
```

```
data %>% count(Education)
```

```
data_edu <- data %>%
```

```
  filter(Education != "Prefer not to say")%>%
```

```
  filter(Education != "")
```

```
# create vector for grad average all
```

```
grad <- subset.data.frame(data_money, Education == "Graduate or professional degree (MA,
```

```
# create vector for bach average all
```

```
bach <- subset.data.frame(data_money, Education == "University Bachelors degree")$all
```

```
uni = c(grad, bach)
```

```
# create vector for no_uni average all
```

```

no_uni <- subset.data.frame(data_money, Income != "University Bachelors degree" & Income

# t-test for significant variation all
t.test(grad, bach, alternative = c("less"))
t.test(uni, no_uni, alternative = c("less"))

mean(grad)
mean(bach)
mean(no_uni)
mean(uni)

# create vector for grad average HR.HE
grad <- subset.data.frame(data_money, Education == "Graduate or professional degree (MA,

# create vector for bach average HR.HE
bach <- subset.data.frame(data_money, Education == "University Bachelors degree")$HR.HE

uni = c(grad, bach)

# create vector for no_uni average HR.HE
no_uni <- subset.data.frame(data_money, Income != "University Bachelors degree" & Income

```

```
t.test(uni, no_uni, alternative = c("less"))
```

```
#### analysis Income ####
```

```
data %>% count(Income)
```

```
data_money <- data %>%
```

```
  filter(Income != "Prefer not to say")%>%
```

```
  filter(Income != "")
```

```
# create vector for rich average all
```

```
rich <- subset.data.frame(data_money, Income != "Less than 25,000 Euros")$all
```

```
# create vector for decent average all
```

```
decent <- subset.data.frame(data_money, Income == "Less than 25,000 Euros")$all
```

```
# t-test for significant variation all
```

```
t.test(rich, decent, alternative = c("less"))
```

```
# create vector for rich average HR.HE
```

```
rich <- subset.data.frame(data_money, Income != "Less than 25,000 Euros")$HR.HE
```

```
# create vector for decent average HR.HE
```

```
decent <- subset.data.frame(data_money, Income == "Less than 25,000 Euros")$HR.HE
```

```
# t-test for significant variation HR.HE
```

```
t.test(decent, rich, alternative = c("less"))
```

```
# create vector for rich average HR.LE
```

```
rich <- subset.data.frame(data_money, Income != "Less than 25,000 Euros")$HR.LE
```

```
# create vector for decent average HR.LE
```

```
decent <- subset.data.frame(data_money, Income == "Less than 25,000 Euros")$HR.LE
```

```
# t-test for significant variation HR.LE
```

```
t.test(decent, rich, alternative = c("less"))
```

```

#### analysis male vs female ####

data %>% count(Sex)

data_sex <- data %>%
  filter(Sex != "Other")

# create vector for female average all
Female <- subset.data.frame(data_sex, Sex == "Female")$all

# create vector for female average all
Male <- subset.data.frame(data_sex, Sex == "Male")$all

# t-test for significant variation all
t.test(Male, Female, alternative = c("less"))

```

```

# create vector for female average LR.LE
Female1 <- subset.data.frame(data_sex, Sex == "Female")$LR.LE

# create vector for female average LR.LE
Male1 <- subset.data.frame(data_sex, Sex == "Male")$LR.LE

# t-test for significant variation LR.LE
t.test(Male1, Female1, alternative = c("less"))

# create vector for female average HR.LE
Female2 <- subset.data.frame(data_sex, Sex == "Female")$HR.LE

# create vector for female average HR.LE
Male2 <- subset.data.frame(data_sex, Sex == "Male")$HR.LE

# t-test for significant variation HR.LE
t.test(Male2, Female2, alternative = c("less"))

# create vector for female average LR.HE
Female3 <- subset.data.frame(data_sex, Sex == "Female")$LR.HE

# create vector for female average LR.HE
Male3 <- subset.data.frame(data_sex, Sex == "Male")$LR.HE

```

```

# t-test for significant variation LR.HE
t.test(Male3, Female3, alternative = c("less"))

# create vector for female average HR.HE
Female4 <- subset.data.frame(data_sex, Sex == "Female")$HR.HE

# create vector for female average HR.HE
Male4 <- subset.data.frame(data_sex, Sex == "Male")$HR.HE

# t-test for significant variation HR.HE
t.test(Male4, Female4, alternative = c("less"))

# print means
mean(Male, na.rm = TRUE)
mean(Male1, na.rm = TRUE)
mean(Male2, na.rm = TRUE)
mean(Male3, na.rm = TRUE)
mean(Male4, na.rm = TRUE)

mean(Female, na.rm = TRUE)
mean(Female1, na.rm = TRUE)
mean(Female2, na.rm = TRUE)
mean(Female3, na.rm = TRUE)

```

```
mean(Female4, na.rm = TRUE)
```

```
# Women have a more emotional response to stories
```

```
p0 <- ggplot(data=data_sex, aes(x=Sex, y=all)) +  
  stat_summary(fun.data=mean_sdl, geom="bar", fill="steelblue")+  
  ylab("")+  
  xlab(("Overall")) +  
  coord_cartesian(ylim = c(0, 75))
```

p0

```
p1 <- ggplot(data=data_sex, aes(x=Sex, y=LR.LE)) +  
  stat_summary(fun.data=mean_sdl, geom="bar", fill="steelblue")+  
  ylab("")+  
  xlab(("LR.LE")) +  
  coord_cartesian(ylim = c(0, 75))
```

p1

```
p2 <- ggplot(data=data_sex, aes(x=Sex, y=HR.LE)) +  
  stat_summary(fun.data=mean_sdl, geom="bar", fill="steelblue")+  
  ylab("")+  
  xlab(("HR.LE")) +  
  coord_cartesian(ylim = c(0, 75))
```

p2

```
p3 <- ggplot(data=data_sex, aes(x=Sex, y=LR.HE)) +  
  stat_summary(fun.data=mean_sdl, geom="bar", fill="steelblue")+  
  ylab("")+  
  xlab(("LR.HE")) +  
  coord_cartesian(ylim = c(0, 75))
```

p3

```
p4 <- ggplot(data=data_sex, aes(x=Sex, y=HR.HE)) +  
  stat_summary(fun.data=mean_sdl, geom="bar", fill="steelblue")+  
  ylab("")+  
  xlab(("HR.HE")) +  
  coord_cartesian(ylim = c(0, 75))
```

p4

```
grid.arrange(p0, p1, p2, p3, p4, ncol= 5, top = "Comparison - Sex")
```

```
# plot regarding income, inconclusive  
ggplot(data=data_money, aes(x=Income, y=all)) +
```

```

stat_summary(fun.data=mean_sdl, geom="bar", fill="steelblue")+
ylab("")+
xlab(("Overall")) +
coord_cartesian(ylim = c(0, 125))

```

```

# plot regarding education, inconclusive
ggplot(data=data, aes(x=Education, y=all)) +
  stat_summary(fun.data=mean_sdl, geom="bar", fill="steelblue")+
  ylab("")+
  xlab(("Overall")) +
  coord_cartesian(ylim = c(0, 7))

```

```

# plot regarding age
ggplot(data=data, aes(x=Age, y=all)) +
  stat_summary(fun.data=mean_sdl, geom="bar", fill="steelblue")+
  ylab("")+
  xlab(("Overall")) +
  coord_cartesian(ylim = c(0, 7))

```

```

#### analysis mature vs young ####

```

```

data %>% count(Age)

# create vector for female average HR.HE
mature <- subset.data.frame(data, Age > 29)

mature_val <- mature$all

# create vector for female average HR.HE
young <- subset.data.frame(data, Age <= 29 & Age >17)

young_val <- young$all

# t-test for significant variation HR.HE
t.test( young_val,mature_val, alternative = c("less"))

plot(mature)
plot(young)

ggplot(data=young, aes(x=Age, y=all)) +
  stat_summary(fun.data=mean_sdl, geom="bar", fill="steelblue")+
  geom_smooth()+
  ylab("")+
  xlab(("Overall")) +
  coord_cartesian(ylim = c(0, 100))

```

```

ggplot(data=mature, aes(x=Age, y=all)) +
  stat_summary(fun.data=mean_sdl, geom="bar", fill="steelblue")+
  geom_smooth()+
  ylab("")+
  xlab(("Overall")) +
  coord_cartesian(ylim = c(0, 100))

```

```

ggplot(data=subset.data.frame(data, Age >17), aes(x=Age, y=all)) +
  stat_summary(fun.data=mean_sdl, geom="bar", fill="steelblue")+
  geom_smooth(colour = 'red')+
  ylab("")+
  xlab(("Age")) +
  ggtitle("Age Comparison")
  coord_cartesian(ylim = c(0, 110))

```

ANOVA

create databases with relevant variables

rename columns, set the appropriate level for reason and emotion, remove NAs

```
data_new_1 <- cbind.data.frame(data$LR.LE, data$Sex, data$Age, data$Education, data$Income)
```

```
colnames(data_new_1) <- c("Reputation", "Sex", "Age", "Education", "Income", "Country")
```

```
data_new_1$Reason <- "Low"
```

```

data_new_1$Emotion <- "Low"
data_new_1 <- na.omit(data_new_1)

data_new_2 <- cbind.data.frame(data$HR.LE, data$Sex, data$Age, data$Education, data$Income, data$Country)
colnames(data_new_2) <- c("Reputation", "Sex", "Age", "Education", "Income", "Country")
data_new_2$Reason <- "High"
data_new_2$Emotion <- "Low"
data_new_2 <- na.omit(data_new_2)

data_new_3 <- cbind.data.frame(data$LR.HE, data$Sex, data$Age, data$Education, data$Income, data$Country)
colnames(data_new_3) <- c("Reputation", "Sex", "Age", "Education", "Income", "Country")
data_new_3$Reason <- "Low"
data_new_3$Emotion <- "High"
data_new_3 <- na.omit(data_new_3)

data_new_4 <- cbind.data.frame(data$HR.HE, data$Sex, data$Age, data$Education, data$Income, data$Country)
colnames(data_new_4) <- c("Reputation", "Sex", "Age", "Education", "Income", "Country")
data_new_4$Reason <- "High"
data_new_4$Emotion <- "High"
data_new_4 <- na.omit(data_new_4)

# row bind the dataframes
data_new <- rbind.data.frame(data_new_1, data_new_2, data_new_3, data_new_4)

```

```

# create regression
# Emotion * Income
reg <- dynlm( Reputation ~
              # Emotion * Income
              Reason
              + Emotion
              + Sex
              + Age
              # + Education
              # + Income
              # + Country
              , data = data_new)

AIC(reg)

# output summary
summary(reg)

# plot different aspects of the regression
plot(reg)

# plot residual analysis
checkresiduals(reg)

# plot residuals
plot(reg$residuals)

```

```

# qqplot residuals
# qqPlot(reg$residuals)

# check homoskedasticity of residuals (they are homoskedastic)
lmtest::bptest(reg)


# hypothetical mock example
data1 <- rbind.data.frame(data, data, data, data, data, data, data, data, data, data)


## t test
# H1 - reason good
t.test(data1$LR.LE, data1$HR.LE, alternative = c("less"))
t.test(data1$LR.HE, data1$HR.HE, alternative = c("less"))

# H2 - emotion good
t.test(data1$LR.LE, data1$LR.HE, alternative = c("less"))
t.test(data1$HR.LE, data1$HR.HE, alternative = c("less"))

# H3 - emotion > reason
t.test(data1$HR.LE, data1$LR.HE, alternative = c("less"))

```

```
# extra  
t.test(data1$LR.LE, data1$HR.HE, alternative = c("less"))
```

```
#### END ####
```