



European Master in Business Studies

Master Thesis' Exposé



**Determining the success of persuasion strategies within
chatbots: implementation of the ELM framework.**

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List of Abbreviation

ELM: Elaboration Likelihood Model
HCI: human-computer-interaction
AI: artificial intelligence
PAI: product attribute irrelevant
PAR: product attribute irrelevant

**Title: Determinants of persuasion strategies' success within chatbot:
implementation of the ELM framework**

Abstract

Background: *Together with the increasing implementation of messaging services, the number of conversation and communication formats is becoming always more significant. Moreover, the market landscape is undergoing a new digital revolution, where artificial intelligence is overtaking human resources and replacing them with virtual agents (van Bruggen et al., 2010) Therefore, it is necessary to provide new directions and new scenarios to facilitate this emerging flow of research. (Kumar et al., 2016).*

Aim: *The research examines how persuasive strategies employed in chatbot services translate into product attitude changes through the conjoint effect of self- efficacy and product knowledge.*

Methodology: *In order to understand the consumers' interaction with a chatbot and, especially, which are the main factors that might influence the persuasiveness of the chatbot suggestions, the research implemented an experiment asking to the respondents to interact with a chatbot and to submit an online questionnaire. The target groups of the study will be everyone with a precedent experience with chatbot, either for shopping or other purpose.*

Contributions: *The study contributes to the body of research about the consumers' usage of an HCI tool, focusing the attention on the implementation of the chatbot as a virtual assistant with ability to persuade the customer during their shopping online. Furthermore, the study intends to present to the companies that are using chatbots an overview of the drivers of persuasion and the possible correlation with customer characteristic.*

Keywords: *chatbot, persuasion, ELM framework, conversational agents, attitude changes*

1 Introduction

Together with the increasing implementation of messaging services, the number of conversation and communication formats is becoming always more significant. Moreover, the market landscape is undergoing a new digital revolution, where artificial intelligence is overtaking human resources and replacing them with virtual agents (van Bruggen et al., 2010). Therefore, it is necessary to provide new directions and new scenarios to facilitate this emerging flow of research. (Kumar et al., 2016). In this new reality Chatbots, voice assistants and augmented reality are the tools most used by consumers to make purchasing decisions (Turban et al., 2017).

More than before, these conversation agents are designed and implemented as personal assistants, who make suggestions based on the information that the agents have access to. Accordingly, the size of the US chatbot market is expected to reach around \$1.25 billion in 2025, up sharply from the market size of \$190.8 million in 2016 (Statista,2019). After-sales and customer service in US are the areas where most businesses implement conversational bots, followed by CRM, sales and marketing. On the receiving side, as of 2017, consumers had the highest level of acceptance for the use of chatbot in online retail industry (Statista, 2019). What emerges is a possible scenario in which chatbots will have the opportunity in the future to sell products based on the needs of each customer (Moriuchi, et al. 2020), as confirmed by evidences that undisclosed chatbots are as effective as proficient workers and four times more effective than inexperienced workers in engendering customer purchases (Luo et al. 2019).

E-commerce managers are perfectly aware of a new paradigm shaping online shopping experiences, and many of them have already implemented various designs for increase the conversion rate. In doing so, they have affected indirectly its persuasiveness, even though in its simplest form like perceived trust (Nah & Davis, 2002), involvement and navigation design (Cyr et al., 2018). The possibility to employ chatbots on a regular base in the online-shopping, hence, does not seem so much unrealistic (Saad & Abida, 2016). Therefore, researchers should investigate more persuasive design strategies for the conversation agent and their message (Rhee & Choi, 2020).

The studies developed until know regarding the application of a persuasive conversation in chatbot design, have analyzed several specific applications of the this tool to influence the users. Among the others, we can mention: entertainment and language learning (Atwell & Shawar, 2007), education tool (Kerly et al., 2007), healthcare

(Bickmore et al., 2013). Therefore, the applicability of persuasion theories in a chatbot-user interaction is an emerging research field, being integrated successfully in different contexts and replicable for further purpose.

However, if we start to look at the details while some studies have empirically examined the impact of undisclosed chatbots on customer purchase intention (Luo et al. 2019), empirical researches examining the impact of persuasive message on product-attitude changes through a conversational agent, remain scarce (Saad & Abida, 2016). Moreover, previous researches on IT and persuasion have centered on “persuasive technology”, marking only the role of persuasion profiling (Kaptein, et al. 2015), or rather on digital personal assistants to persuade user tasks accomplishment (Paay, et al. 2020). In addition, several noticeable attempts have been conducted to investigate the application of persuasion elements towards customers with different elaboration levels in an online framework. Among the others, interesting researches have been conducted in an on-line used-car-selling scenario with a software agent (Shiu-li Huang, et al. 2006), in the issues addressing involvement in the website design (Cyr, et al. 2018), and in improving smart tourism decision support satisfaction (Yoo, et al. 2017). In all of them, unfortunately, the stimulus used may limit the generalizability of the findings. Moreover, counter-evidences (proper of real field experiment) of the results are not provided. Therefore, as marketers already have high expectations of chatbot services, the need to examine their effectiveness in driving attitude changes is emergent.

In this context, although the interest in chatbots is increasing, there are still several opportunities available to increase the knowledge in this research field (Van Eeuwen, 2017). In this context, yet, no researches have been developed to assess how is possible to enhance product attitude through a simple chatbot, focusing on the persuasiveness of the content of the messages exchanged and, then, understanding the possible differences among user which can mitigates this effect.

This study contributes to service marketing literature as well as the emerging research stream on chatbot (and more generally, conversational agent) in marketing in several ways. First, when examining the impact of persuasion on user attitude the research concentrates on user experiences in a Human-computer interaction.

Second, the research draws on the Elaboration Likelihood Model considerations to point out how persuasive messages, while using chatbot services, can take place during the interactions, being mitigated indirectly by motivation and content understanding together.

These latter in the form of self-efficacy towards the tool and prior knowledge of the product. Third, the research provides insights into how the occurrence of persuasion drivers plays out for firms, modifying the perceived product value and the willingness to pay for it.

To conclude, the work is related to and extends the literature on text-based chatbots (e.g., Sivaramakrishnan et al. 2007, Köhler et al. 2011, Saad and Abida 2016, Mimoun et al. 2017) and extend this literature by providing real-world field experiment evidences. This study aims to gauge whether the use of persuasive techniques in chatbot services translate into firm beneficial elements. Hence, the research examines how persuasive strategies employed in chatbot services translate into product attitude changes through the conjoint effect of self-efficacy and product knowledge.

2 Theoretical Framing

The theoretical foundation of this study is based on the Elaboration Likelihood Model (Petty & Cacioppo, 1986), developed and widely spread in the context of communication strategy and persuasive messages design. All the others main concepts analyzed in the study will be described, by collecting the several definitions found in relevant papers.

2.1 Persuasion

Persuasion can be defined, in its simplest form, as a “human communication that is designed to influence others by modifying their beliefs, values, or attitudes” (Simons, 1976). There have been developed several definitions of persuasion, since the first scholars have approached this phenomenon. The accredited father of this branch of researches is Carl Hovland, who proposed the so called “Yale Model of Persuasion” (Hovland et al, 1953) leveraging on a message learning approach. For Hovland and his colleagues, the persuasions studies had to be based on the science describing how individual learn. Accordingly, they delineated four underlying and mediating elements recurrent on persuasion attempts. First, a persuasive message must arrive to a receiver’s attention and being comprehensible. Subsequently, the receiver must be willing to analyse the message and implement a series of reflections on the content, having outlined its advantages and incentives. In the end, the subject must bear in mind the information for persuasion to occur. The output of this information exchange process regards attitude, belief, and behavioural changes. Even though its innovativeness is clear, Hovland’s work

has never been recognised as a theory; but its relevance opened the railway for the understanding of source, message, channel, and receiver’s elements for future persuasion theories.

Accordingly, O’Keefe (1990) argued that there are requirements for the sender, the means, and the recipient to consider something persuasive. First, persuasion involves a goal and the intent to achieve that goal on the part of the message sender. Second, communication is the means to achieve that goal. Third, the message recipient must have free will (i.e., threatening physical harm if the recipient does not comply is usually considered force, not persuasion). That is why, persuasion is not accidental, nor is it coercive. It is inherently communicational (Dainton & Zelle, 2017).

In a recent work of 2009, Cameron provided a brief categorization of the main persuasion theories developed after Hovland’s work and employed in the health communication domain, recognising 15 theories divided in 6 categories. Even though Cameron’s work was specifically designed for a patient-provider context, the results (Table 1) can be considered coherent with the purpose of this section as they are identified following “constructs and variables intended to shape, reinforce or change the response of the other” and “applied at many levels including intrapersonal, interpersonal, organizational, and mass communication “(Cameron, 2009). Cameron’s study, then, can work perfectly as a generalized finding of the main known theories around persuasion.

Table 1

persuasive theories, models, and framework applicable to the patient-provider context (Cameron, 2009)

Theoretical category	Theories discussed
Message effects model	Message learning approach “Yale Model of Persuasion” Fear appeals: Protection Motivation Theory Extended Parallel Theory Language Expectancy Theory
Attitude-behaviour approaches	Theory of Reasoned Action/Theory of Planned Behaviour Triandis Model of Interpersonal Behavior
Cognitive processing theories	Elaboration Likelihood Model Heuristic-Systematic Model

and models	Social Judgment Theory
Consistency theories	Balance Theory Cognitive Dissonance Theory Probabilistical Models
Inoculation theory	Inoculation Theory
Functional approaches	Functional approaches

When it comes to field applications, the persuasion studies found a perfect ground back for several industries, but mainly in healthcare, education, politics, advertisement, and technologies design.

One common stage in all the practical oriented researches around these fields, is the attempt to identify not only the persuasion framework in which to shape the communication, but also all the possible drivers of influence. Hence, the number of influencing principles that can be used for the ultimate purposes of persuasion (changing attitude or behaviour) is high (Kaptein et al., 2015) being the relative research surrounded by different attempts of explanation. The theory knows great attempt like the six principles of Cialdini (2001,2004), the 40 strategies of Fogg (2002) and the 64–category compliance gaining strategies of Kallermann and Cole (1994). These studies allow the achievement of an adequate level of comprehension, essential to study and analyse the phenomenon with the purpose of the implementation and recognition of the various ways through which exert persuasion (Kellermann and Cole,1994; O'Keefe,1994; Kaptein et al., 2015).

Coherent with its aim and with the flourish literature combining persuasion and computer mediated environments (Shiu-li Huang et al, 2006; Kaptein, 2011; Guadagno et al, 2013; Kaptein et al. 2015; Yoo et al., 2017; Cyr et al. 2018; Rhee & Choi, 2020), this research will implement a dual model of cognitive processing theory (ELM) and the six influence principles discussed by Cialdini (2001). The reasons for this choice are, for the first, the wide applicability and the extensive literature productions. Moreover, a dual route orientation may provide an insightful guide to attract all the social and indirect (in the sense of not argument-based) cues which are not possible to be included in other attitude change theories like the Action Theory of Persuasion (ATP) or the Theory of Planned Behaviour (TPB). Second, the use of Cialdini's principles is due to both the high

academic award around his work and the easy implementation of this principles in a dual processing model like ELM.

2.2 Elaboration likelihood model (ELM)

The Elaboration likelihood model (ELM) considers the phenomenon of persuasion first of all as a cognitive process, because in order to accept or reject persuasive messages, the recipients are involved in mental processes of acknowledgement with their own motivation and ability to process the message, or with the lack of one of these two (Dainton & Zelle, 2017). Being a dual model approach, it offers several opportunities to draw the reality, characteristic which is confirmed by the high presence of this model within marketing and IT researches field. Indeed, thanks to it, Miniard, Sirdeshmukh, and Innis (1992) have been able to analyze the persuasive effect of peripheral advertising over Brand choices. Moreover, it has been also employed to test the correlation among several different concepts in order to evaluate their likelihood of determining the elaboration of the persuasive message, fundamental for the further development of several advertisement practices in the years after its theorization. An example is the work of Gotlieb and Swan (1990) which tested the source credibility as a persuasive argument within the ELM, and price saving as motivator to process the message.

Developed by Petty and Cacioppo (1986), ELM outlines two main ways to obtain influence or persuasion towards the recipient: messages addressed centrally and messages addressed peripherally (which based on the emotional involvement of the recipient can be influenced by superficial means of persuasion). Each of these two paths, is usable only towards a specific audience with delineate characteristic. As a result, an essential element for the correct implementation of the ELM is to understand the members of the audience before creating a persuasive message, as the model states that the success of a persuasive message depends on how recipients interpret and give meaning to the content of the message itself. Importantly, ELM argues that both routed messages are affected by two factors at the same time:

- (a) degree of motivation to process all the information
- (b) degree of ability to process the message cognitively.

Moreover, the persuasive messages are defined by the model as elaborated arguments that can be measured as strong, neutral, or weak and their respective effect has considerable differences in the impact over the attitude.

To conclude, the model can be perfectly integrated with the researches of Cialdini (1993) which identified seven common cues that signal the use of a peripheral message (named: authority, commitment, contrast, liking, reciprocity, scarcity, and social proof) which have found wide use in the reference literature and can be perfectly deployed for the scope of this research.

2.3 Human-computer interaction

HCI is defined as the study of complex computer technologies and tools and their interaction with users. Also essential for this field is the study of how these systems can be designed to facilitate the use of consumers (May, 2001). In detail, the exchange of commands and inputs with the machine is made possible through the use of a conversion language that makes the interface comprehensible and ready for the human approach, without the need for decoding machine signals. Within the above-mentioned study, the focus of the HCI is shifted to include new social areas, such as psychology, to become integrated with social aspects such as attitudes, beliefs, prejudices and experiences.

2.3.1 Conversational Commerce

Conversational commerce is a new driving theme for online shopping practitioners and digital marketers, mainly characterized by the involvement, in some phases of business-to-consumer interaction, of IA applications or in general of conversation agents for commercial purposes (Eeuwen, 2017). The literature around this point has, for some time now, had to know several initiatives in order to arrive at the definition of common elements in its facets. For example, the possibility of guaranteeing convenience, personalization and assistance in the decision-making process (Baier et al., 2018). For the purposes of this work, conversational commerce will be referred to the experimentation of direct exchanges of messages between user and chatbot, in the context of shopping through an e-commerce site.

2.3.2 Chatbot

With an increasing use of personal computers there is a growing inclination toward the possibility to communicate with machines in the same way as with persons (Atwell & Shawar, 2007). The idea of creating a computer that could imitate human behavior is the basis of the creation of chatbots (Almansor & Hussain, 2019) employing natural language technologies to recreate a human-like conversation with the user (Lester et al., 2004). In order to better understand the purpose of this research, the reader must be provided with a further clarification. The behavior of a chatbot with AI technologies for conversations is enormously different from the chatbot that will be considered in this study, being it a shopping chatbot, an automated online assistant tool which is able to have small to medium difficulty of conversations with the user. There are generally two different and distinct typologies of chatbot framework. One is called Rule-Based Chatbot and is anchored on a precise pre-set of conversation rules, in which user's inputs must be found within a set of pre-made answers and an opened conversation is impossible. On the other hand, Natural Language Processing Chatbot involves AI capabilities and are characterized by features such as hierarchical structure of language comprehension and logical reasoning, which let it able to create connections between previous questions and reply with an appropriate answer without being precisely programmed for it. The areas where chatbots have been implemented are various: from entertainment and education, to healthcare and recommendation. However, the study will focus exclusively on the ecommerce sector, with the aim of exploring ways in which consumers can be influenced through a rule-based chatbot inserted in the purchase process of a specific product.

3 Research Hypotheses / Propositions

The following section aims to present the research model and the research hypothesis. Furthermore, a comprehensive table summarizing the most relevant literature researches are displayed

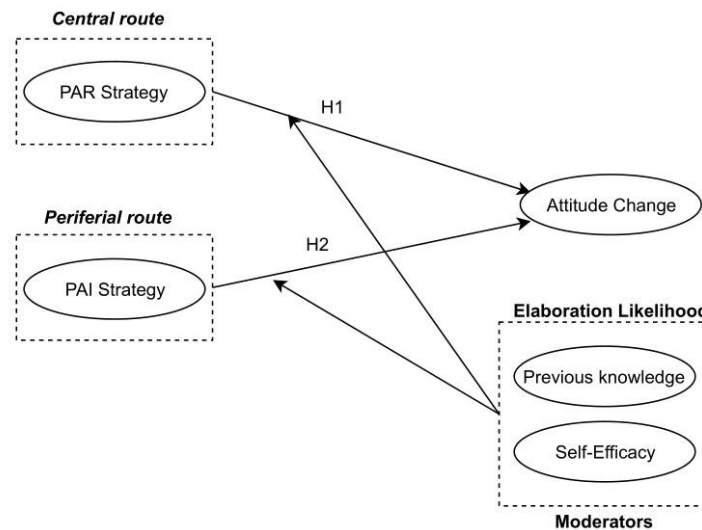
3.1 Research model

Based on the review of dual processing models (Figure 1), this study developed a set of hypotheses to identify the effects of different persuasion strategies on the building of a positive attitude when a conversational agent recommends a product. Product Attribute Relevant (PAR) strategy were deployed as central route affecting method. On

the other hand, several Product Attribute Irrelevant (PAI) strategies have been adopted to have access to the peripheral route. To conclude, Self-efficacy and Prior Knowledge were set as mediating conditions.

Figure 1

Research model



3.2 Hypothesis

According to the purpose of the research, the first groups of hypotheses are

H1: The PAR persuasion strategy has a stronger effect on attitude change than the PAI persuasion strategy to a customer with a high elaboration level

H2: The PAI persuasion strategy has a stronger effect on attitude change than PAR persuasion strategy to a customer with a low elaboration level.

Afterwards, the following hypotheses are based on the ELM prediction that when subjects lack either sufficient motivation or ability to process the message, a persuasive argument based on argument quality would have different effect. In order for the reader to better understand this last point, a preliminary overview of the moderator is required.

3.2.1 Self-efficacy

The main purpose of this phase of the study is to examine the possible determinant of higher motivation to process the message. Prior literature in ELM has identified self-efficacy, defined as individual user's perceived ability of performing an activity to acquire expected outcome (Bandura, 1997), as a key elaboration likelihood (Zhou, 2012).

Consequently, the Elaboration Likelihood Model could be applied to suggest that self-efficacy towards chatbots, might influence the motivation to process the message.

High self-efficacy helps users to allocate their mental energy to message processing. For example, one element of self-efficacy is competency, which can be seen as a manifestation of the ability to reasoning and focusing (Altobello, 2007), which in turns increases the availability of cognitive resources for assessing information (Petty & Cacioppo, 2012). Confidence through having experienced the relevant subject for several times allows users not to lose the point and thus leads engage and deep reasoning (Garcia-Marques & Mackie, 2001). On the other hand, if individuals do not have enough competency, skillfulness, and knowledge of using chatbot for shopping purpose, they can perfectly been sceptics on putting their energy to assess the message quality because they merely do not know it well or simply are not able to response to it (Petty & Cacioppo, 2012). In this situation, self-efficacy can still work as addressor to their information processing routes with chatbot but resulting (if considered alone) in disparate levels of attitude changes. Therefore, the employment of self-efficacy as a variable and moderator in the role of influencing motivation to process the message would be consistent with the Elaboration Likelihood Model.

3.2.2 Prior Knowledge

Empirical evidence recognizes that the ability of the recipient of the persuasive message to process the received input may vary due to prior knowledge of the subject and repetition of this (Petty et al., 1997).

These studies are coherent with what described in the work of petty and Cacioppo (1986), showing that the effects of persuasive messages depend more on the intrinsic characteristics of the subject than on circumstantial factors. In addition, some researchers have managed to demonstrate empirically how previous knowledge can be identified as a driver for product evaluation (Maheswaran, 1994; Maheswaran et al.,1996; Rao & Monroe, 1988; Rao & Sieben 1992).

Prior knowledge can be defined as “the extent to which a person has an organized structure of knowledge (schema) concerning an issue” (Petty & Cacioppo, 1986). When the individual's prior knowledge is scarce, even the most insignificant insights within the persuasive message can be effective in changing preferences.

When, on the other hand, the subject can count on a certain amount of previous experience, it is difficult to prefer messages that are not based on the quality and congruence of the information (Cacioppo et al., 1982; Wood, 1982). As part of their research, Rao and Monroe (1988) have adopted the guidelines previously discussed within a commercial context. They demonstrated to what extent various types of consumers, different for their degree of consolidated knowledge of the product, may or may not use price as an indicator of the quality of the good. Their results, in line with the aims of this research, confirmed the correlation between perceived knowledge and the ability to process information.

In confirmation of what has been said, according to Rao and Sieben (1992) individuals who do not enjoy a high level of knowledge of the product and who are not able to evaluate the right price, perceive a price provided from the outside as more appropriate than for individuals who are at a high level of knowledge.

According to the two concepts previously explained, the hypothesis developed around the two concepts employed as a moderator are the following:

H1a: If self-efficacy is low and prior knowledge is high, the PAR strategy has weak effect on attitude change.

H1b: If self-efficacy is high and prior knowledge is high, the PAR strategy has a strong effect on the attitude change.

H2a: If self-efficacy is low and prior knowledge is low, the PAI strategy has high effect on attitude change

H2b: If self-efficacy is high and prior knowledge is low, the PAI strategy has high effect on attitude change

3.3 Literature review table

Table 2

Relevant academic literature

<i>Title</i>	<i>Author</i>	<i>Year</i>	<i>Contribution</i>
Understanding Agent-Based On-Line Persuasion and Bargaining Strategies: An Empirical Study	Shiu-li Huang, Fu-ren Lin & Yufei Yuan	2006	It provides some guidelines for e-commerce initiatives to design sales agents for on-line selling activities, considering different customers characteristic and persuasive messages
An Application of the Elaboration Likelihood Model	Jerry B. Gotlieb, John E. Swan	1990	It examines the effect of price savings on the motivation to process the message, helping to solve the lack of sufficient empirical evidence supporting the ELM for persuasive arguments to influence attitudes. Moreover, testing source credibility as a persuasive argument within the ELM, this experiment contributes to the source credibility literature.
Improving travel decision support satisfaction with smart tourism technologies: A framework of tourist elaboration likelihood and self-efficacy	Chul Woo Yoo, Jahyun Goo, C. Derrick Huang, Kichan Nam, Mina Woo	2017	Adopting it to the Elaboration Likelihood Model, this study investigates the impact of the smart tourism technology characteristics on travel decision support satisfaction and the moderating effects of self-efficacy on the main relationships. The hypotheses are revolving around both the central route and peripheral routes in the elaborated process, and have been tested with survey data collected from South Korea.
			Drawing on social response and commitment-consistency theory, it

AI-based chatbots in customer service and their effects on user compliance	Martin Adam, Michael Wessel, Alexander Benlian	2019	empirically examine how verbal anthropomorphic design cues and the foot-in-the-door technique affect user request compliance. The study is thus an initial step towards better understanding how AI-based CAs may improve user compliance
Effects of personalization and social role in voice shopping: An experimental study on product recommendation by a conversational voice agent	Chong Eun Rhee, Junho Choi	2020	Employing the Elaboration Likelihood Model, this study examines the persuasion mechanism in product recommendations made by a voice-based conversational agent and explores whether the agent's social role of a friend, generate a more positive attitude toward the product in the context of voice shopping. Moreover, it provide a perfect set of items to use in order to evaluate attitude change
Impact of Argument Type and Concerns in Argumentation with a Chatbot	Chalaguine, Hunter, Potts, Hamilton	2019	To persuade through a chatbot, they presented methods for acquiring arguments and counterarguments, and importantly, meta-level information that can be useful for deciding when arguments can be used during an argumentation dialogue. They evaluated these methods in studies with participants and show how harnessing these methods in a chatbot can make it more persuasive.
The science and practice of persuasion.	Cialdini, R. B., & Goldstein, N. J.	2002	According to the previous work of R.B. Cialdini, the paper summarizes the previously discovered basic principles that govern how one person might influence another

A practitioner's guide to persuasion: An overview of 15 selected persuasion theories, models and frameworks.	Cameron, K. A.	2009	It provides a brief overview of 15 selected persuasion theories and models, and present examples of their use in health communication research
The elaboration likelihood model of persuasion.	Petty, R. E., & Cacioppo, J. T.	1986	Main source for explaining this dual routes model and the effects of message towards attitude change
When the Damage is Done: Effects of Moral Disengagement on Sustainable Consumption	Sven Kilian, Andreas Mann	2020	Within the literature of sustainable consumption, they contribute to the broader discussion on why there is a gap between attitudes and actual behaviours of consumers regarding sustainable behaviour like purchasing products with better socioecological performance. It provides a good context/ scenario for the purpose of my research, together with a good general example of experimental design

4 Methodology

In this section, the read can find a more detailed overview of the research methodology, comprehensive of examples and explanation of the stimulus provided to each treatment groups. Moreover, further explanations will include the sample profile description, the experimental design, the experimental context and the data analysis procedures.

4.1 Research design

The present study tested the effect of applying different on-line persuasion strategy to customers who have different elaboration levels and needs. A field experiment results fundamental to give more consistency to the literature around The Elaboration Likelihood Model, providing more empirical evidence of its practical application, and being also in line with the previous researches in this field of study. The experiment simulated the suggestions among several sustainable product in a e-marketplace scenario between an agent and a human buyer. The agent was a chatbot serving as a virtual salesperson to persuade the human buyers to opt for a sustainable product.

Sustainable products were chosen as the stimulus for the experiments because the markup price between non-sustainable and sustainable products is noticeable and the average shopper is not usual to give reasons for it. (no source for this?) Before the experiment, the instructor told each subject a cover story outlining a scenario in which the subject would act as a prospective buyer of a normal marketplace dealing with a sales agent which would have given him suggestions on the category of products selected.

The Experiment tested the magnitude of the attitude change after PAR or PAI persuasion strategies were applied to different types of buyers, such as having or not having prior product knowledge, and perceiving self-confidence towards the chatbot.

4.2 Experimental design

Respondents will be randomly divided into three groups (Figure 2). One group (G3) is defined as “control group” which aims of studying what kind of attitude follows when no external input is given.

Indeed, this can be considered as a neutral environment, necessary to understand how respondents would react without any collateral intervention or manipulation. Another group (G1) is defined as “experimental group number 1”; this group is subjected to a PAR persuasion strategy. The aim of this group, which differs from the previous case, is to understand how respondents modify their attitude towards the product when they are manipulated through a central route persuasion strategy. The last group (G2) is defined as “experimental group number 2”; this group is subjected to a PAI persuasion strategy.

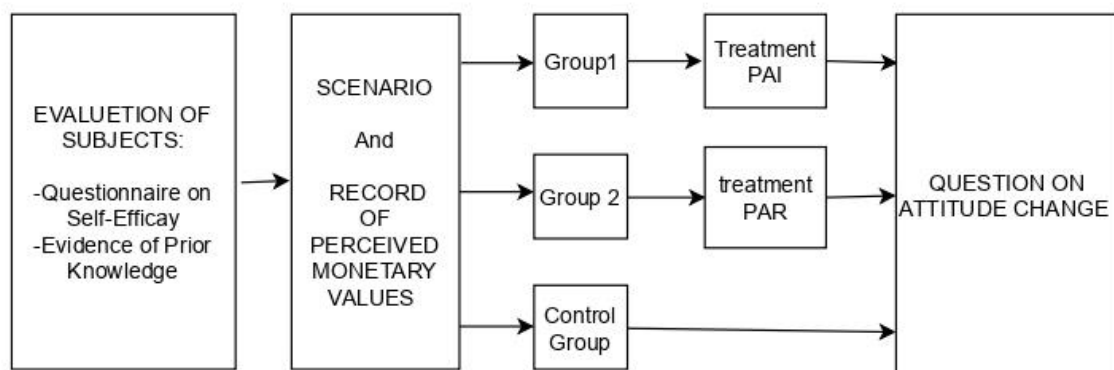
The aim of using a PAI persuasion strategy is to investigate how respondents modify their attitude when being in contact with peripheral route persuasion strategy.

All the aforementioned groups and results will be recorded after an online questionnaire has accessed the relevant value of the moderators selected. Together with them, the perceived monetary value of the product will be asked in a first attempt without the manipulative effect of the stimulus. For an in deep overview, refer to Appendix A for items tested in this study.

Each of the persuasion strategies will be considered as an independent variable while the moderating variables to evaluate the elaboration likelihood will be the level of Self-efficacy of subjects towards the chatbot and their Prior Knowledge of the chose product among that available.

Figure 2

Representation of the experimental design



4.2.1 Treatment of “experimental Group number 1” – Product attribute relevant strategy (PAR)

Any product can be considered as the combination of a series of three sub-assemblies: the core product, the actual product, and the augmented product (Kotler & Armstrong, 1994). Using the term “core product” we identify the series of benefits or attributes indispensable to the customer, i.e. those for which the customer is actually paying, and which materially solve his problem. In turn, starting from the core product is possible to arrive at the real product, adding five dimensions: quality, features, design, brand, and packaging. Other less product-related and more service-oriented features such as installation, after-sales service and customer-credit delineate the boundaries of the incremental product.

Brooksbank (1995) analyses the differences between the new customer-oriented sales model and the traditional sales-oriented model. In short, the focus and priorities have

now been reversed and the fundamental element for a successful salesman consists of the ability to intercept concrete or latent needs in order to match them to the characteristics of the product offered. By highlighting the advantages of the product/service offered, the seller can create the conditions for a simpler and more effective sale. What matter, for this research, is that the product characteristic does not change according to the customers. Instead, what changes is the perceived advantages of the product in correlation to the customer's specific needs and, hence, the level of satisfaction bring by the product/service.

Therefore, and according to Ross (1990), the PAR persuasion strategy needs to elicit facts, statistics, and testimony as evidence validating the claims regarding a product's features, advantages, and benefits.

4.2.2 Treatment of “experimental Group number 2” – Product attribute irrelevant strategy (PAI)

In the business environment, it is a matter of fact that in certain circumstances some persuasive techniques can have a greater result even if the message does not focus on relevant product attributes (Shiu-li Huang et al., 2006) . These techniques, hence, do not focus on the product relevant attributes but rather leverage on heuristic cues to route the receiver decision making. In fact, within a heuristic decision-making process, individuals are more inclined to use certain cues, rules of thumb or superficial elements to decide whether to accept a request or not (Guadagno et al. 2013). In his work of 1993 about social influences, Cialdini identified six fundamental principles that can be deployed to address peripheral route messages: scarcity, reciprocity, consistency/commitment, authority, social proof, and liking.

Among the persuasion and social influence literature, several researchers have matched the correspondent business applications of Cialdini's principles in the real word, giving us a comprehensive list of case application techniques. These include, among the other techniques: free sample, door-in-the-face, foot-in-the-door, low-balling, informational social influence, scarcity, labeling and legitimization of paltry favor. The technique of free sample (or uninvited gift) suggests that a favor leads to clear feelings of obligation on the part of its recipient and then a behavior in accordance, while a positive attitude is evident in absence of a strong normative pressure (Regan, 1971).

The door-in-the-face technique is based on empirical evidences stating that going from a very important request to a less important one, if the latter is the real objective, increases the probability of accepting the less extreme request, thus driving persuasion (Cialdini et al. 1975). The foot-in-the-door technique allows to create compliance towards a solicitation in an individual through a small first request, to be followed by a second more expensive request which consists in the persuader's objective (Guéguen, 2002). This technique is even more functional when the first request triggers self-perception while the second ascends it (Shiu-li Huang et al., 2006).

The low-ball technique dictates that a persuader can induce a person to freely decide to take a specific action, assuming that the decision persists even after the introduction of an additional cost. In its most employed form within the business, the technique involves the presence of a beneficial condition one step before the time of the decision, and only then informing the subject of the full cost of the action. Empirical evidence shows that, within the condition of the low-ball techniques, there will be compliance to perform the fully described action anyway. (Cialdini et al. 1978).

The informational social influence technique is based on the assumption that if the subject is made aware of the existence of a list or a number of other contenders, this increases the credibility of the persuader or makes the message more important. (Shiu-li Huang et. al, 2006). It appears to be strongly linked to social norms, considering how in uncertain situations a person tends to compare their idea with the group's behavior before deciding. Moreover, this can also have a confirmatory value, as there is a tendency to consider a choice as more appropriate when shared by the group (Cialdini, 2009).

The limited-number or deadline technique leverages the scarcity principles described by Cialdini (2009) because, according to Shiu-li Huang et. al (2006): “people tend to assign high values to scarce items because their availability serves as a shortcut cue to their quality, and people lose freedom as these items become scarce.” Indeed, the scientific evidence provided by studies on the limited-number or deadline indicates that the principle of scarcity has a positive impact on evaluation and attitude towards the subject of the message (Aggarwal, Jun & Huh, 2011).

The “labeling techniques” involves the inclusion of the characteristics of a person with undefined feelings, within a specific label. In this way, it is easier to persuade the subject as people often try to meet the expectations of others, and those they have of themselves regarding the label (Shiu-li Huang et. al, 2006).

The “legitimization of paltry favor” assumes that asserting legitimacy upon receipt of a favor is an easier way to see a small request satisfied than an explicit request. Because the request is of little significance, it is difficult for the subject to refuse or otherwise offer a low level of assistance. It can be summarized by the slogan “Even a dollar will help” (Cialdini & Schroeder, 1976).

All the aforementioned strategies will be employed in this study, and can be summarized in Table 3, together with an example of each of them.

Table 3

Examples of Product Attribute Irrelevant tactics

<i>Principle</i>	<i>Techniques</i>	<i>Example</i>
	Labeling	<p><i>Chatbot:</i> Sorry [name], could I ask you what you do in your life?</p> <p><i>User:</i> Sure, I am *****</p> <p><i>Chatbot:</i> Well, I would say a ***** is curious enough to questioning him/her-self on the degree of impact in the environment of a non-sustainable product like this. People who have this sensibility generally think twice before to final the purchase</p> <p><i>User:</i> Well, I am not following you...</p> <p><i>Chatbot:</i> I mean...Could I propose you another option? You seem a smart person! I believe you will find it interesting</p>
Reciprocity	Free sample	<p><i>Chatbot:</i> “Hey There! Have you got time for a quick chat?</p> <p><i>User:</i> No</p> <p><i>Chatbot:</i> I just wanted to say..we are offering our visitors a FREE COUPON of 5€ to start their shopping experience</p> <p><i>User:</i> Show me the gift</p>

		<p><i>Chatbot:</i> Ok great, I can do it! I just need to know your name to start</p> <p><i>User:</i> *****</p>
	Door-in-the-face	<p><i>Chatbot:</i> Have you ever consider of changing your habits to help the earth?</p> <p><i>User:</i> Yes, I do sometimes</p> <p><i>Chatbot:</i> Wow! Why don't you enroll in the Green Peace project? I know their looking for volunteers in Alaska...</p> <p><i>User:</i> It seems too extreme, isn't it?</p> <p><i>Chatbot:</i> well, you are right. What do you think, instead, of starting to look for some sustainable product together?</p>
Commitment/consistency	Foot-in-the-door	<p><i>User:</i> Show me the gift</p> <p><i>Chatbot:</i> Ok great, I can do it! I just need to know your name to start</p> <p><i>User:</i> *****</p> <p><i>Chatbot:</i> perfect! Now I need your email to send you the gift. Buy the way, would you like to be added in our e-mail list to receive further info on our product or possible unique discounts?</p> <p><i>User:</i> yes</p> <p><i>User:</i> *****@*****</p>
	Low-balling	<p><i>User:</i> [after several interaction] Ok great, the deal sounds great! We can conclude</p> <p><i>Chatbot:</i> Well, unfortunately I have to tell you that for this product we have to charge some commission fee and taxes for the delivery of **€, but if you</p>

		agree there will not be any other changes in the conditions
	Legitimization of paltry favor	<p><i>User:</i> I don't think I am so convinced</p> <p><i>Chatbot:</i> I can see, but it is really a nice jacket! And you are a real demanding customer, unfortunately for me. Do not make me lose my customer satisfaction percentage. Listen, give me one more chance, even one minute more of your time to discuss would help</p> <p><i>User:</i> Ok, Tell me</p>
Social proof	Informational social influence	<p><i>Chatbot:</i> I can understand your doubts. If it might help, consider that currently other 20 guys are seeing this same item in this moment...and it seems that is one of the highest ranked in terms of user satisfaction</p>
Scarcity	Limited number	<p><i>Chatbot:</i> were you thinking of a specific brand for the Shampoo?</p> <p><i>User:</i> No</p> <p><i>Chatbot:</i> Great! Then, I have two news for you. The good one is that I have found an amazing offer. The bad one is that there are just 30 units left in the store. Would you like to discover what it is?</p> <p><i>User:</i> Yes</p>
	Deadline	<p><i>Chatbot:</i> Right now, I have only 3 pair of shoes left of that size. It's hard to say whether you'll still have a chance to get</p>

		<p>it if you wait! What happen if then you will change your mind?</p> <p><i>User:</i> ok, tell me more</p>
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4.3 Research context and sample description

The experiment will be conducted exclusively online, trying to recreate as much as possible the condition of the normal environment of the shopping activities in a e-marketplace. For this reason, it will be carried out thanks to the use of a chatbot builder platform called Quriobot (<https://quriobot.com/>) and an online survey platform: Sphinx (<https://sphinxdeclic.com>).

The target sample will be drawn from the population of consumers who has already had at least one single experience with the e-shop and/or with chatbot purchasing, without taking into account whether or not it has had experienced the purchase of one of the set of product selected for the purpose of the experiment.

4.4 Data collection procedures

The experiment will be addressed online, through different social media means (Facebook, LinkedIn, WhatsApp) in the form of a web-link. Before the experiment, participants will need to open to it with their browser, being them redirecting to a Sphinx survey webpage that will randomly pre-allocate them in one of the different groups. The main advantage of this procedure consists in its cost and time saving, being it effective in order to avoid both the use of multiple links and decrease the chance of any procedural mistakes. Afterword, in a common stage for all individuals, they will be asked whether they have ever had or not experience in chatbot interaction, being it the only characteristic required to be consistent with the sample characteristic and to participate at the experiment. The subject will remain, for the whole experiment, within the Sphinx web domain, avoiding unnecessary steps that could increase the possibility of having to cancel his answers. Within this phase, the experiment setting will be briefly described and information about the estimated time required will be provided, together with a brief presentation of the scenario involved. Then, they will be provided with a section of the survey where their demographics will be collected and their perceived self-efficacy

towards chatbots will be assessed. For this purpose, a four-item scales with seven-point rating systems will be deployed, ranging from 1 being strongly disagree to 7 being strongly agree, adapting it from the research of Yoo et al. (2017) about smart tourism technology.

Subsequently, participants of the experiment will be firstly asked to select a specific product among a set of categories of no-branded good, provided with attributes description and price. Then, they will be asked to disclose a reference price for the same product but in its environmental-sustainable version (having received the necessary specifications on attributes). This procedure, regarding reference price's disclosure, is similar to Shiu-li Huang et. al (2006). Afterword, a 3 items survey will evaluate their knowledge of the chose product, basing on the examples about Keystone XL oil pipeline provided Cyr et al. (2018).

Once this pre-experiment phase is concluded, the experiment itself will start, thanks to the possibility of incorporating the chatbot into the questionnaire provider, and so without skipping into a new web-session. Here, interaction flow will start and the chatbot will try to convince them to opt for the environmentally sustainable version of the chose product. It is important to underline that it will not be mandatory for the subjects to simulate the process of the payment. Indeed, the experiment will be considered concluded when the subjects will manifest the willingness to close the interaction with the chatbot, either if the persuasive attempts will be positive or not. After the experiment, the respondents will have to disclose their reference price, since they will be asked again how much they expect to pay for the environmentally sustainable product, considering the contents of the interaction with the chatbot. This use of a singular item to evaluate the attitude change is consistent with the researches of Shiu-li Huang et al. (2006) and Bergkvist and Rossiter (2007).

4.5 Data analysis procedures

Since the prior aim of this research is to evaluate the existence of statistical evidences between the groups subjected to the described treatments, a statistical group comparison will be adopted thanks to the ANOVA testing procedure.

5 Expected Contributions

From the proposed research, three easily identifiable contributions emerge. First, while the reference literature on online agents investigated only simple visual and verbal stimuli (Shiu-li Huang et al, 2006; Rhee & Choi, 2020; Sands et al., 2020) this research examines a more substantial set of interaction elements related to an online agent (chatbot) that relates to a complex role such as the role of the seller. Drawing from the intersections of both online persuasion research (Dutta et.al, 2020; Guadagno et al., 2013) and conversation agents (Van Pinxteren et al., 2020, Bavaresco et al., 2020), this work investigates how the chatbot's interaction content and its persuasive strategies influence the consumer product attitude change. Interaction content involves the type of information (attributes relevant or irrelevant) exchanged between the agent and the customer, and persuasive strategy refers to whether the agent message have the likelihood to be elaborate under an heuristic decision-making process or not (Shiu-li Huang et al., 2006). Some scholars argue that by simply conveying social influential content by reacting to the user interaction, agents foster consumer perceived satisfaction (Sands et al., 2020) and then product attitude change (Rhee & Choi, 2020). Others show that proactive interaction through both functional and social influential content leads to more effective persuasion (Pickard et al., 2012). This current research examines these two elements separately, moderating them with user technology affinity, because doing so it more closely approximates the dynamics of specific communication behaviour (Van Pinxteren et al., 2020). This research contributes to the literature by examining how firms can best align interaction contents and strategies in chatbot–customer interactions, particularly on refers to persuasion determinants.

Second, the research contributes to the marketing theory on consumer behaviour by introducing an experimental support for further studies on the drivers of attitude change in an online setting, examining how it accounts for the effect of chatbot–customer interactions on service efficacy parameters. Drawing from previous studies (Shiu-li Huang et al, 2006; Van den Broeck et al., 2019) the approach of this research tries to follow the current conceptualization of chatbot employment, which is not only limited to meet customer queries, and examines how new customers adjust to unknown product or service characteristic by way of their agent-based online interactions. Following the intuition of Yoo et al. (2017) the study uses self-efficacy and combine it with prior

knowledge as integral explanatory constructs to show the relationship between conversation strategies and their outcomes, being attitude a possible precursor of purchase intention in the online environment (Abdul-Muhmin, 2010; Hassanein & Head, 2005).

In doing so, the work is related to and extends the literature on text-based chatbots (e.g., Sivaramakrishnan et al. 2007, Köhler et al. 2011, Saad and Abida 2016, Mimoun et al. 2017) by providing real-world field experiment evidences.

Furthermore, the research empirically reinforces the previous findings of several studies thanks to the use of a set of different products choices (Shiu-li Huang et al, 2006) and several compliance techniques (Adam, et al., 2019).

Third, it is important to underline that the research assesses the impact of previous chatbot usage on the interaction's performance measure, being the first the sole element to recognize the sample members. An obstacle in the adoption of this interactive technologies, thus, could involves questions about the perceived ease of use of the layout. Therefore, it is important to consider the financial consequences and return on investment of such efforts (Hildebrand & Bergner,2019). Accordingly, the work uses the change in willingness to pay as an objective financial outcome on customers' usage of a specific online agent within the e-commerce sector, in order to help practitioners in evaluating such an investment. In regard to this last point, the study shows how different persuasive strategies can positively influence service usage outcomes and monetary returns, knowing only two of all the possible characteristics of the service recipient.

6 Thesis chapters overview

1. Introduction

2. Theoretical Framework

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2.2 Attitude towards sustainable products

2.3 Elaboration Likelihood Model (ELM)

2.4 Human-computer interaction

2.4.1 Conversational Commerce

2.4.2 Chatbot

3. Research Hypotheses/Propositions

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4 Methodology

4.1 Research design

4.2 Experimental procedure and data collection procedures

4.2.1 treatments “experimental group 1”- Product-Attribute-Relevant

4.2.2 treatments “experimental group 2”- Product-Attribute-Irrelevant

4.3 Research context

4.4 Sample description and size

5. Results and Data Analysis

6. Discussion

7. Contributions and Limitations

8. Conclusions

9. References

Appendix

7 Workplan

The following table (Table 4) tries to organize all the tasks to be carried out to meet the final delivery of the thesis, scheduled for January 2021. Please note that the following schedule is intended to be only a provisional reference point for the work to be carried out and will therefore be subject to change.

Table 4*Workplan*

TASK	TIME PERIOD
Literature review	September 2020
Exposé submission	30 th September 2020
Instrument development	1st October – 25 th October 2020
Instrument pilot test	25 th October - 5 th November 2020
Buffer	6 th November – 8 th November 2020
Data collection	9 th November – 26 th November 2020
Buffer	27 th November – 30 th November 2020
Data cleaning	1st December – 4 th December 2020
Data Analysis	5 th December – 10 th December 2020
Buffer	10 th December – 14 th December 2020
Thesis writing	10th December – 8th January 2021
Thesis Submission	13th January 2021

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Appendix A – Measurement Items

Construct	Original Items	Adapted Items	Scales
Self-Efficacy	I have necessary skills to use tourism website and app.	I have necessary skills to use a chatbot	From 1 (strongly disagree) to 7 (strongly agree)
	I have knowledge of using tourism website and app.	I have knowledge of using chatbots	From 1 (strongly disagree) to 7 (strongly agree)
	I am confident of using tourism website and app even if there is no one around to show me how to do it.	I am confident of using a chatbot even if there is no one around to show me how to do it	From 1 (strongly disagree) to 7 (strongly agree)
Prior Knowledge	How knowledgeable are you regarding the Keystone XL oil pipeline	How knowledgeable are you regarding the [product chose]?	From 1 (novice) to 7 (expert)
	Have you previously viewed television coverage regarding the Keystone XL oil pipeline?	Have you previously viewed television coverage regarding the [product chose]?	From 1 (never) to 7 (often)
	Have you previously read news coverage regarding the Keystone XL oil pipeline?	Have you previously read news coverage regarding the *product chose*?	From 1 (never) to 7 (often)
Attitude Change		Please, disclose your perceived monetary value for the *product chose*? (before and after the experiment)	No scale (open question)
	Please, rate your overall impression of the product according to this 9 point scale: Bad/Good	Please, rate your overall impression of the product according to this 9 point scale: Bad/Good	From -4 to +4
	Please, rate your overall impression of the product according to this 9 point scale: Unsatisfactory / satisfactory	Please, rate your overall impression of the product according to this 9 point scale: Unsatisfactory / satisfactory	From -4 to +4
	Please, rate your overall impression of the product according to this 9 point scale: Unfavourable / favourable	Please, rate your overall impression of the product according to this 9 point scale: Unfavourable / favourable	From -4 to +4