(Not) All Reviews Are Helpful:

An Exploratory Study on Consumers' Perceived Diagnosticity of Online Books Reviews

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Abstract

The present study aims to analyse the concept of consumers perceived diagnosticity in online books reviews in order to give an overall view on the effects of reviews on perceived helpfulness and on consumers decision-making process about the purchase of a book. The sample includes reviews posted on the webpage of five best sellers on Amazon.co.uk. The paper analyses the relations between stars ratings and helpfulness votes in order to confirm existing theories proved in other economic sectors, such as positive bias and negativity bias. Then the research focuses on the written comments, both on the themes covered by reviewers, that are mainly regarding the content of the book and the author, and the length of the reviews, that does not clearly affect perceived usefulness of reviews. Eventually, the study explores the relationship between the date when reviews are posted and the perceived diagnosticity of these reviews. It discovered that reviews are affected both by early birds bias and winner circle bias.

The subject of the research required the employment of a mixed method due to the necessity of confirming actual theories about the relationship between numerical data and diagnosticity and proposing new hypothesis concerning reviews' themes. The findings suggest that previous theories that are valid in other sectors may be applied for the book sector as well, but there is the need for further research, especially regarding the written comments. In fact, the themes that were disclosed are new and need to be proved. Also the reviews length seems to have any clear relationship with perceived helpfulness.

Keywords:

diagnosticity, reviews, books, helpfulness, digitalization

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Content

1.Introduction

According to the infographic research undertaken by Global English Editing about reading habits worldwide in 2017, more than 70% of adults in the U.S.A. and Europe have read at least one book in 2016 (Brown, 2017). Nielsen BookScan announced that print book market in the UK grew 2.1% in value and 0.3% in volume in 2018 (Flood, 2019). This means that, even with the changes introduced by digitalization i.e. ebooks, audiobooks and the presence of new cultural activities for the leisure time, such as Netflix, there exists an audience which is still reading and buying books. Even though the creative industry of publishing houses is facing new challenges due to digitalization, books are still an important sector of the economy.

Before the wide diffusion of the Internet connection, readers used to buy books in physical shops. Nowadays the most common channel to buy books is the Internet, specifically through retail websites. The Bookseller stated that books sales on Amazon grew of 46% only in the first semester of 2017 (Onwuemezi, 2017), albeit Publishers Weekly reported a slight increase of 1.9% of worldwide books sales in the same year (both in physical and digital environment[1]) (Milliot, 2018). Since books sales on Amazon increase more sharply than the overall sales, it is possible to assume that consumers are more likely to buy books on that website than in any other distribution channel. Before the massive adoption of the digital distribution channels via the Internet, readers used to buy books in physical shops. In the physical environment the decision-making process was determined not only by their individual tastes and previous readings, but also by friends' recommendations, salesperson's advice, and experts' suggestions provided by TV shows, reviews on newspapers and magazines. The decision about the purchase of a book concerned only the books that were stock in the store, the information available in the books themselves, and the opinions of acquaintances. Since July 5th, 1994, when Amazon was founded by Jeff Bezos in Seattle, readers have been buying more and more products online. Using retail bookstores online, it is possible to order a book throughout a website and receive it at home with the delivery service. The digital environment of these websites has changed the way readers conclude their decision-making process about books purchase, which is not only based on the book but also on the additional information available on the website. Purchasing goods online

[1] Digital environment can be defined as "A context, or a "place", that is enabled by technology and digital devices, often transmitted over the Internet, or other digital means, e.g., mobile phone network. Records and evidence of an individual's interaction with a digital environment constitute their digital footprint." (Kotsanis, 2018, p. 59)

does not affect directly consumers' tastes but it has an impact on the information research process and eventually on the final decision about what book to buy.

Online retail websites offer a delivery service for their orders and, more important, pieces of information about the goods that the websites are selling. This information may come from two different sources. Firstly, the website itself provides generic data about the author, year of publication, number of pages, genre, price, sales rankings and a short summary of the book. Secondly, it is often possible to read reviews and ratings posted by other consumers on the same page of the retail website. In this case, online customers reviews represent peer-generated product evaluations posted on company or third party websites (Mudambi and Schuff, 2010). They usually concern individual opinions about the book that can be more or less detailed. Supplying additional information, the digital environment affects the decision-making process about books consumption since it lowers consumers' search costs. However, not every retail website supplies the same information as each one has different features. Moreover, the channels that are employed to deliver it, affect the perception process in customers. Academics characterize consumers' perceived diagnosticity as "the perceived ability of a Web interface to convey to customers relevant product information that helps them in understanding and evaluating the quality and performance of products sold online." (Mudambi and Schuff, 2010, p. 188). Particularly, this concept may be applied to online reviews only considering the extent to which customers recognize as useful the information carried by online reviews in order to conclude their purchase.

The main aim of this exploratory study is investigating how different components of an online review shape consumers' perceived diagnosticity on Amazon.co.uk website within a small sample of items. Amazon.co.uk has been chosen as a case study since it is the worldwide biggest incumbent firm in online book sales and it has websites all over the world. This paper is questioning the role of reviews star rating in consumers' perceived diagnosticity to assess whether there is either a positive or a negativity bias, or both. The core part of the reviews, that is the written comment, is analysed for the content, explaining what kind of words and themes are the most recurrent and which ones are considered as the most useful by readers. Moreover, looking at the date when reviews are published, it is possible to see how timelines bias affect perceived diagnosticity on online book reviews. All these features may have relevance for managers in the publishing industry who want to sell their products on online bookstores since they provide a deeper understanding of the features affecting the consumers' decision making process and could enhance to a better implementation of books retail websites.

The remainder part of the paper is structured as follows: the second chapter gives an overall review of the literature about online books sales, electronic word-of-mouth and the concept of perceived diagnosticity. The third chapter describes the methodology used to tackle the research questions. The fourth chapter shows the findings and the data analysis of the research. The last chapter describes the conclusions of the study, including the limitations and suggestions for further research.

The main research question is formulated as follows, "*to what extent do the different aspects of online reviews affect consumers' perceived diagnosticity on books retail websites?*". Even though the research question at hand explores only the main features, the different parts of the reviews are expected to have different effects on consumers diagnosticity. Therefore, it is necessary to divide the question in more specific subquestions:
Subquestion 1: What is the effect of stars rating biases on consumers perceived diagnosticity of reviews?
Subquestion 2: What kind of themes covered on online reviews are considered as more diagnostic by consumers?
Subquestion 3: To what extent do reviews length affect helpfulness votes of reviews?
Subquestion 4: Do reviews date and early bird bias influence effectively reviews helpfulness votes number?

2. Literature review

In order to effectively determine the concept of consumers' perceived diagnosticity of books reviews on online retail websites, it is useful to introduce first the reasons why books are so successfully sold online.

Since the Internet era began, books have been one of the first items traded online. As noticed by Ramrattan and Szenberg (2016), books are cheap goods, easy to store in and to deliver. According to the authors, this is the reason why shopping online and home deliveries are convenient both for sellers and for consumers. Similarly, Latcovich and Smith (2001) analyse books as if they were commodities so that online books sales are particularly advantageous because the market has small set-up costs compared to the market size.

Within this framework, the story of Amazon is emblematic per se. The founder, Jeff Bezos, has never wanted to trade only books, so now the platform trades several different items. However, he decided to begin with books because he thought it was the easiest way to enter the market of online retailing (Latcovich and Smith, 2001). Eventually, Amazon succeeded as it became the "Earth's biggest bookstore" as Bezos promoted the company (Easter and Dave, 2017). Moreover, books are also easy to review, rate and search on search engines, so that books can be considered "a natural product to buy and sell online" (Ramrattan and Szenberg, 2016, p.120).

Together with Amazon, the whole books retail sector has changed due to digitalization. Being digitalization defined as the sum of all the changes induced by the usage of digital technologies within an organization, it regards four main levels (Parviainen, Tihinen, Kääriäinen, and Teppola, 2017). At a process level, digitalization modifies organization's processes embracing new digital tools (digitization). Digitalization also redefines the services offered by the organization, excluding the old ones and creating new services. In the business domain level, it changes the value chain structure. Eventually, at a society level, digitalization reshapes the decision making processes in society (Parviainen et al., 2017). Within the publishing sector, there are four main consequences. Thanks to the invention of ebooks, the paper as a medium is not necessary to distribute the content anymore. Moreover, the Internet has become a new distribution channel, where consumers can choose, purchase and order the items online receiving them directly at home. According to Brynjolfsson and Smith (2000), items sold on online retailers' websites are cheaper than those sold on bricks-and-mortar shops, even considering shipping costs. Next to that, online retailers and platforms offer delivery services, which are not available for bricks-and-mortar shops. Significantly, the most innovative consequence of books e-commerce is the possibility of comparing prices and books' versions using search engines which lowers consumers' information search costs.

Thanks to the Internet, consumers can look for information online in four different ways (Baye, De Los Santos, and Wildenbeest, 2015). First, they can use general search engines and click on the links to specific websites. On the top consumers will see paid results; on the bottom unpaid ones will appear. Secondly, price comparison sites can provide information about content and prices for free for users and lead them to the retailers' websites (Bookfinder.com, AddALL.com). Third, consumers may search for a book on booksellers' websites where they can find also suggestions based on previous orders (Waterstones.com, Alibris.co.uk). Finally, they can search on the closed device they use to read ebooks, such as Kindle by Amazon.

2.1 Traditional versus online sales

As reported by Bestsellers and Publisher Weekly, nowadays most of the people use intermediary online retailers or bookstores, such as Amazon websites or Alibris.co.uk, to purchase books (Milliot, 2018). Online retailers are publishing houses' websites which sell only those books they published, while online bookstores may be bricks-and-mortar online shops or platforms and they may also sell items from third parties. Amazon.co.uk is one of those platforms which sells self-published books in addition to books published by other editors. The results of a survey conducted in the Netherlands in 2016 about the reasons for online books purchasing on Bol.com, prove the preference of consumers for online purchase over purchases in physical shops (Statista, 2016). The main reasons why consumers buy books online is the availability of the websites 24 hours per day, the easy access to the information on the website, and the lower price (Statista, 2016).

Among all the important features of online retail websites that emerged in the survey by Statista, this paper focuses especially on the available information about books quality, content, and prices. However, it has to be acknowledged that information about the price is not particularly relevant in this study for two main reasons. First of all, on the Internet there is no significant price competition because firms differentiate themselves mainly through services and discounts (Ramrattan and Szenberg, 2016) and consumers respond better to advertisement than to price differentiation among sellers online (Latcovich and Smith, 2001). For instance, Amazon offers both discounts for paper books and ebooks and the Amazon Prime subscription, which allows fast deliveries for free. The second reason is mostly related to the pieces of academic research that have been already undertaken in this field. In fact, the positive relationship between (helpful) reviews, consumers' willingness to pay and consequently sellers' ability to charge higher prices has already been confirmed by many studies (Chen, Dhanasobhon, and Smith, 2006; Clemons and Gao, 2008).

Academics assert that consumers search for information in order to improve their decision-making process about purchasing a good (Stigler, 1961). For instance, tourists planning holidays persist searching for information until they reach the point when the expected benefits of continuing the research are lower than the costs for this research (Gursoy and McCleary, 2004). In other words, consumers conclude the information-search process when the information search costs are too high or higher than the expected benefits. The Internet, and particularly e-commerce, lowers consumers' search costs giving recommendations and facilitating the information-search process (Brynjolfsson, Hu, Simester, 2011; Baye et al. 2015). Consequently, besides the advantages of the services related to the purchase of the good and of lower prices, the unique selling point of retail websites is mostly represented by the extra information about that good that they are able to supply. Moreover, thanks to the provision of information for free, bookstores can lead potential consumers searching for information on their websites instead of others, attracting them with a better designed purchase experience (Ramrattan and Szenberg, 2016).

Information and content provided for free or for very low search costs lead to believe in the Zero Pricing theories on the Web (Farchy, 2011). Distribution and reproduction of certain kind of goods have minimal marginal costs thanks to the Internet and the effects of digitalization, so there exist (part of) products that are now supplied for free to consumers, especially for reproducible cultural goods in which the creative part is the content itself and not the medium, such as music and literature. For instance, on Spotify it is possible to listen for music for free, while on Amazon consumers can read the first chapter of ebooks for free or can read the summary of the book without buying a newspaper searching for reviews or press release.

Although it seems that users can have zero-price information and free contents online, such as reviews and samplings for books, the economic model that determines the provision of such goods for free allows suppliers to make a profit anyway. Even though online content of certain reproducible goods is non-rivalrous and can be shared freely once one copy has been sold, producers and suppliers try to appropriate of the economic value in a different way, without making the users paying. Offering products (almost) for free, sales of related goods should increase (Farchy, 2011), for instance in order to read cheap ebooks consumers need to buy a much more expensive e-reader. However, bookstores offer not only some items for free, but more often they provide tools for consumers to acquire information about the book they want to buy. For instance, free samplings of books may represent a proof of the quality of the good so consumers are willing to pay more (Brynjolfsson and Smith, 2000; Latcovich and Smith, 2001). Moreover, the possibility of reading others' reviews is quite common as a source of additional information so customers are sure that the item suits their needs and sellers can charge higher prices (Clemons and Gao, 2008).

2.2 Online feedback systems

Feedback is a form of prosocial behavior, which occurs when consumers leave a public evaluation about a purchase for which they do not obtain any payoff (Tadelis, 2015). Online feedback usually comprises a score or star system which summarize a longer and exhaustive verbal comment posted by other consumers or experts. In case of Amazon websites, the feedback system allows also to rate the feedback itself, giving helpfulness votes to single reviews. Feedback provision is a phenomenon which contradicts the expectations about the attitude of a homo oeconomicus (Tadelis, 2015). Under a rational analysis, reviews have no reasons to be provided by websites for three main arguments: first, this prosocial behavior does not harmonize with the theory of the homo oeconomicus[2]; second, users may use the information provided by one platform in order to complete the purchase on other websites (Tadelis, 2015); third, the website leaves a (huge) part of the power of providing information to users (Chevalier and Mayzlin, 2006).

Consumers have different incentives to post feedbacks because they experienced the good in a different way; consumers tend to post positive reviews and to continue using the same platform once they had a good experience (Duan et al., 2008), while not-satisfied consumers usually leave the platform that did not pleased them for another one (Tadelis, 2015). Satisfied consumers have more incentives to return to the website to post and purchase again, thus the average of online reviews are positive (Chevalier and Mayzlin, 2006). Consequently, there are many reputational externalities not only because buyers do not receive any payoff for their feedback, but also across sellers because they cannot internalize

[2] Homo oeconomicus is the fundamental and theoretical basis for most of the models in classical and neo-classical economics, formulated for the first time by John Stuart Mill in 1836. The homo oeconomicus (economic man) is an individual who acts only for the maximization of her own wealth. Notably, the homo oeconomicus compares the effects of the means to obtain the best possible outcome to satisfy her well-being given the means (Ng and Tseng, 2008).

the utility of a satisfied consumer returning to the marketplace (Duan et al., 2008; Tadelis, 2015).

What differentiates digital bookstores from physical shops or simple online catalogues is their feedback system, which provides additional information. Both in physical and in online shops it is possible to read the first pages or the first chapter of a book in order to gain a first overview of the content and the quality of the book. It may be argued that physical shops offer more and higher-quality information since sales assistants are usually experts on genres, authors, and new books. Normal bookshops host also events such as talks or readings with authors, which can be considered as another channel for the distribution of additional information. However, in physical shops these recommendations and feedback are given by experts, while on online bookstores recommendations and feedback are posted by peers. Since users consider reviews written by peers more helpful than experts reviews (Li, Huang, Tan, and Wei, 2011), online consumers' reviews are perceived as more diagnostic than experts reviews in physical shops.

Higher consumers' willingness to pay, sales of more expensive related goods, and the possibility of charging higher prices are advantages which have lead sellers to invest in the transition toward online books sales (Brynjolfsson and Smith, 2000; Clemons and Gao, 2008). However, the incredible growth of e-commerce marketplaces is mostly due to the effects of reputation and feedback systems on the consumers side (Tadelis, 2015). These feedback systems in the digital environment are also called "electronic word-of-mouth" (eWOM), since the mechanism are similar to those that govern word of mouth (WOM) in the physical environment. Word of mouth is characterized as "oral, person-to-person communication between a receiver and a communicator whom the receiver perceives as non-commercial, regarding a brand, product or service" (Arndt, 1967, p. 3). Similarly, eWOM is "any positive or negative statement made by potential, actual or former consumers about a product or company, which is made available to a multitude of people and institutions via the Internet" (Hennig-Thurau, Gwinner, Walsh, Gremler, 2004, p. 231).Yet, eWOM is again a person-to-person communication in which the receiver does not perceive a marketing message, but this message is mediated by a device.

Many studies about feedback and recommendation systems demonstrate that reviews are usually biased or inflated (Dellarocas and Wood, 2008; Mayzlin, Dover, and Chevalier, 2014). Generally, user-generated feedback may be biased for two main reasons, which depend from consumers and the feedback system structure itself. The former is the heterogeneity of customers' tastes and preferences, especially for experience cultural goods

(Jaffry and Apostolakis, 2011). The latter depends on the kind of system used by each website because it may lead to fear of retaliation. For instance, on eBay both buyers and sellers can give feedback so sellers may wait for the other party to post the review first in order to evaluate it according to buyers' positive or negative feedback. In addition, corrupted behaviors may occur, for example when sellers pay for increasing their reputation (Tadelis, 2015). However, consumers tend to trust and respond intuitively to feedback since they are loss-averse and affected by information asymmetry (Li et al., 2016; Li and Shimizu, 2018). Information asymmetry occurs when different actors engaged in a transaction have different amount of information about the negotiation, affecting the transaction itself and the relationship between the two parties (Kirmani and Rao, 2000). Since consumers recognize there is an intrinsic information asymmetry, especially when purchasing experience cultural goods, they are more afraid of losses than gains, so they are willing to take hazard to avoid possible losses (Li and Shimizu, 2018). Therefore, even considering possible biases, customers prefer to take risks and trust additional information carried by anonymous online reviews to reduce the information asymmetry.

Online customers' reviews seems to be effective because they are perceived by others as more reliable and trustworthiness since peers are supposed to be more honest (Park and Nicolau, 2014). Unlike experts, peers do not have any other incentive but honesty and altruism when posting online reviews (Duan et al., 2008), so they are more reliable. Moreover, consumers are influenced by others' behavior and opinion. Deutsch and Gerard (1955) divide the influence of others into two different types. Normative influence arises when individuals shape their behavior to adapt to others' expectations. Informational influence occurs when individuals recognize information given by others as trustworthy and real and it leads to herd behavior. The latter type of influence can be employed in the digital environment and contributes to herd behavior regarding online reviews, such as on Amazon. Websites that offer the possibility of writing and reading others' reviews supply indeed an important tool to conclude consumers' purchasing decision, which is additional information. The perception of this additional information leads to the concept of diagnosticity, namely the degree of usefulness of the information provided by a website according to consumers who rely on them to finish the purchase decision-making process (Filieri, 2015). Most of the studies about diagnosticity, reviews and sales in the publishing sector list star rating, sales volume, consumers' recommendations, and helpfulness ratings as factors which cause herd behavior (Bonabeau, 2004).

2.3 Perceived diagnosticity

Diagnosticity per se regards the "perceived correlation between the information available to a consumer and the decision-making process and it is often conceptualized as the degree of the helpfulness of information" (Filieri, 2015). The concept is usually employed in studies about IT, e-commerce, communication and marketing. Nevertheless, it applies also to cultural economics when exploring consumers' decision-making process about the purchase of cultural goods, such as books. Moreover, the notion of perceived diagnosticity relates to digitalization, which is the most important challenge that cultural economics and creative industries have to face nowadays. In this study, perceived diagnosticity does not concern the website in total, but only the reviews related to certain items sold on that website, namely books. In fact, the broad concept of perceived diagnosticity can be transferred also to perceived helpfulness of online reviews related to consumers' decision-making process (Mudambi and Schuff, 2010). Chua and Banerjee (2014) recognize five factors that reveal diagnosticity in online reviews, that are reviewer profile, product type, review rating, review depth, and review readability.

Regarding reviewer profile, many studies already confirmed the influence of reviewers' disclosure of personal data on reviews' recognition and product sales (Forman Ghose, and Wiesenfeld, 2008; Mudambi and Schuff, 2017). Advice that is carried personally, even via an online review in which the name of the reviewer is specified, appears as more reliable than reviews posted with anonymous accounts (Forman et al., 2008). Peer recognition given to popular accounts on Amazon boosts the credibility of the reviewer (such as top reviewers accounts on Amazon.com). Self disclosure about geographical origins reinforces the sense of community as consumers feel they belong to the same place. Self disclosure facilitates also economic exchange as it increases the usefulness of the message in the consumers' perception (Mudambi and Schuff, 2017).

Feedback and recommendations on different kinds of products may have different effects, especially between experience and search goods (Chen, Wu, and Yoon, 2004). Consumers are not able to assess the quality of experience goods before they consume them, so search costs are higher for these products. Conversely, consumers can gather sufficient information about products' features and the brands for search goods, so search costs are lower. As any additional information about experience goods is much more helpful for consumers than additional information about search goods due to different search costs, reviews on experience goods are perceived as more diagnostic than those for search products (Chua and Banerjee, 2014). For this reason, efficacy of reviews and recommendation may be higher for experience cultural goods , such as books, since consumers' search costs are also higher (Chen et al., 2004). Some literature affirmed that consumers' reviews could transform experience attributes of experience goods in search attributes because if more information is available, the decision-making process becomes mostly centered on the information search, as for search goods (Ford et al., 1990; Klein, 1998). However, more recent studies demonstrated that information made available by users' reviews is not affecting experience attributes for experience goods (Yang and Mai, 2010). The information delivered by comments and ratings represents indeed a form of word-of-mouth and affect sales due to herd behavior and trustworthiness (Brynjolfsson and Smith, 2000; Chen, 2008).

The literature on reviewer profile and product type have already been developed by several researchers, and many studies have proved the positive relationships between higher reviews helpfulness and higher sales (Chen et al., 2004; Chevalier and Mayzlin, 2006; Chen, 2008). However, the studies exploring the relationship between stars ratings and perceived helpfulness are not complete as they focused more on the relationship with sales. This thesis aims to fill this gap with reference to the books sector. Moreover, the present paper considers the effects on perceived diagnosticity embodied in helpfulness votes as a function of review length and review content, which are not fully explored from the literature so far. Timelines bias are investigated more and this paper shows also the trend over time of reviews. Eventually, there are no comprehensive studies on perceived diagnosticity on books even though Chevalier and Mayzlin (2006) posit that consumers are highly conditioned by recommendations and feedback in their books purchasing process.

2.4 Stars rating

Stars rating is a score given by consumers about the item and the delivery service offered by sellers and the website. The stars rating represents the valence of the review, which is the inclination of the review measured as negative (1-2 stars), positive (4-5 stars) or moderate (3 stars) (Duan et al., 2008). Stars rating is usually the first information consumers gain from online reviews because they represent a sort of summary of the more comprehensive written comment (Tadelis, 2015). Stars ratings are pivotal to assess consumers' diagnosticity also because often consumers scan the reviews but they do not often read carefully most of them (Madu and Madu, 2002). Users search for information before purchasing books but they do not want to spend a lot of time on the research so they look for the piece of information that is more easy to interpret.

Generally speaking, high-starred and more reviewed books tend to have a higher market share (Chevalier and Mayzlin, 2006; Li and Shimizu, 2018). In fact, if other factors are equal, consumers tend to choose books better rated and with more reviews (Chen et al., 2004). According to Chen (2008), in computer-mediated communication environment consumers usually do what others do, resulting in a diffused herd behavior. Herd behavior was defined in psychology as the adaptation of “consumer product evaluations, purchase intentions, or purchase behavior resulting from exposure to the evaluations, intentions, or purchase behaviors of referent others” (Asch, 1956). Since in the digital environment there exist much more new products available than in the physical environment but consumers do not have access to detailed information for all of them, they rely on others’ evaluations and purchases leading to herd behavior (Brynjolfsson and Smith, 2000). Similarly, consumers tend to trust more popular brands because they believe that popularity is a signal for good quality (Chen, 2008). The same mechanism pertains for bestsellers (Bikhchandani, Hirschleifer and Welch, 1992). Therefore, applying the concept to purchase decision-making process, herd behavior can be defined as the rational phenomenon in which people do what everyone else is doing because others may have information that they do not know (Banerjee, 1992).

Chevalier and Mayzlin (2006) found also that in the two most important books retail websites in the USA, i.e. Amazon.com and BarnesandNobles.com, the reviews are positive on average. This phenomenon is called “positive bias” and it is due to the heterogeneity of consumers' tastes which are randomly distributed among the population (Jaffry and Apostolakis, 2011), so for each genre and each writer style there exist readers who appreciate them. Actually, authors or sellers cannot heavily positively influence the ratings because even if they reviewed a book with a 5-star review, they cannot avoid other people from posting much more relevant 1-star reviews (Chevalier and Mayzlin, 2006). By virtue of prospect theory the marginal effects of positive and negative reviews decrease with the increase in their volume (Li, and Shimizu, 2018). In other words, a 1-star review has a much larger impact in absolute value than a 5-star review, meaning that when reviews are positively biased, negative reviews affect perceived diagnosticity more than positive ones.

Perceived diagnosticity is influenced not only by the valence of single reviews, but also by the valence of reviews sets. Consumers’ perceived reviews usefulness (diagnosticity) is formed by the perception of these reviews as a set for both the balance and the sequence (Purnawirawan, De Pelsmacker, Dens, 2012). The set sequence, that is the order in which reviews appear on the webpage, affects consumers’ diagnosticity in two possible ways. First, the primacy effect is “a cognitive bias that occurs when the first item of a list or a sequence is remembered or chosen over all other items” (Purnawirawan et al., 2012). Secondly, the recency effect makes readers remember the last item of the list as it is usually the latest information they have read (Purnawirawan et al., 2012). Because of the primacy effect, the first reviews are more influential in books purchase decision-making process than the reviews in that in the following pages or in the middle of a page. Conversely, thanks to the recency effects, the last reviews of the list are perceived as more diagnostic by consumers.

The balance is the “ratio of positive and negative reviews” (Purnawirawan et al., 2012) and can be positive, negative or neutral depending on the valence of the stars ratings. Reviews’ set balance, which is the positive or negative inclination of a set of reviews, affects also perceived diagnosticity. If there are incompatible feedback, so the reviews' set is not clearly more positive or more negative, these contradictory signals confuse consumers because they neither assess the quality of the product nor they state whether the purchase is worth it or not. Therefore those moderate reviews’ sets are perceived as less helpful (diagnostic) by customers (Forman et al., 2008). Conversely, sets that are evidently positive or negative provide consistent advice about the quality of the good to consumers, resulting more useful and diagnostic (Forman et al., 2008).

2.5 Written reviews

As stated by Madu and Madu (2002), often consumers scan quickly the webpage to find useful information, so not all consumers read all the reviews but only those who really want to elaborate more on their decision-making process. Customers may look only at the stars rating for a more immediate advice on the product (Madu and Madu, 2002). In fact, online reviews can be split into two parts; the written part contains accurate and comprehensive information about the product, while the star ratings give a quick impression of reviewers’ opinion (Raju and Joseph, 2017).

The written body of reviews was compared to a form of electronic word of mouth (eWOM) typical in the computer-mediated communication. The eWOM represents “Any positive or negative statement made by potential, actual, or former customers about a product or company, which is made available to a multitude of people and institutions via the Internet” (Hennig-Thurau, et al. 2004, p. 231). A positive relationship occurs between this form of eWOM and sales of experience goods such as movies (Duan et al., 2008). Notably, it is not a one-way relationship, but the two aspects are influencing each other. On one hand, eWOM about certain movies contributes to higher tickets sales for these movies, on the other hand, higher tickets sales lead to more eWOM about popular movies (Duan et al., 2008). In other words, online reviews increase the awareness of the existence and the quality of the product among consumers leading to higher sales and consumption of the product reviewed. In the meantime, high sales for popular products drive to a higher number of eWOM as more people consume the product and thus can evaluate it. Particularly, the volume of eWOM increments the awareness about the product among consumers while the valence increases the information about the product (Duan et al., 2008). Even though the relationship was proved to occur in the movies sector, being both books and movies experience cultural goods with similar characteristics on a cultural economics analysis, it seems possible to transfer this relationship in the literature sector. Nevertheless, these conclusions may have limited effects in the publishing sector as movies are available in theaters for a short period, so the measurements of the effects of eWOM are limited to that window of time. Conversely, books are available for a longer period in online stores.

This positive relationship has been found also between the volume of online reviews on books and books market share (Chevrail and Mayzlin 2006). Indeed, the overall volume of eWOM may indicate the popularity of the book and the buzz may increase audience awareness about it (Chevalier and Mayzlin, 2006; Li and Shimizu, 2018). However, this research concerns only the number of the reviews and the ratings but it does not consider investigating the content of those reviews. For instance, since feedback mechanisms are more effective if the reader trusts the reviewer, these reviews have to discuss topics and deliver evaluations that are deemed as important and trustworthy by readers (Chen et al., 2004). The influence of eWOM on sales and consumption of books is not only due to the volume of reviews, but also the content of those reviews matters. As a matter of fact, not all the reviews are equally helpful, but actually only a few reviews for each book are considered as helpful by hundreds of readers.

So far, the written part of reviews was analysed in the literature through four concepts, that are relevance, timeline, accuracy, and comprehensiveness (Raju and Joseph, 2017). Relevance regards the extent of information helpfulness in consumers' purchase decision (Raju and Joseph, 2017). This is particularly important because individuals scanning the webpage need to find easily the information they are looking for. However, reviews do not always mention the content of the book, the writing style, authors' ethic or other crucial themes that are relevant to assess products quality. Timelines regard the state of the website, which needs to be constantly updated in order to perform adequately, displaying both older and new reviews (Madu and Madu, 2002). Information accuracy refers to the preciseness of the information provided by users' opinions (Raju and Joseph, 2017). In fact, reviews that state impressions on books such as "fabolous", "great book", "not worth it" may provide a signal of good or bad quality of the book but they lack of accuracy as readers cannot understand the reasons why reviewers like or dislike the product. Finally, the concept of information comprehensiveness is similar to the notion of information depth given by Chua and Banerjee (2014), as it represents the extent of completeness of the information supplied by the reviews. Reviews usually not cover all the possible themes and features of the book they are evaluating, but they focus on one or two aspects that are deemed as more important by reviewers. Even though the literature available so far examined relevance, timelines, accuracy and completeness in reviews, it does not take into account what kind of themes (and words) are covered in reviews and those considered as more helpful by consumers.

2.6 Helpfulness ratings

One of the most important features available on Amazon websites which makes the usage easier, is the consumers' possibility to rate not only items sold on the retail website but also the reviews on these items according to their helpfulness in providing useful information to potential consumers. This element of the feedback mechanism implemented by Amazon simplifies the research for fruitful information among all the data provided by reviews. Facilitating the decision-making process of potential consumers, reviews helpfulness is a representation of reviews diagnosticity (Li, Huang, Tan, and Wei, 2013; Mudambi and Schuff, 2017). Consumers tastes are given and heterogeneous among the population (Jaffry and Apostolakis, 2011), thus consumers already know their needs and what they like. Online reviews only supply additional information which ease consumers decisions whether to take the risk of purchasing a certain book or not. Therefore, the most helpful reviews are those that provide more and more useful insights about the books. The factors that characterize the helpfulness of the review are its extremity which is the variance from the neutral point and it is summarized by stars rating, and the depth of the comment represented by themes covered and the length of the reviews.

Regarding the prominence of reviews extremity, academics have different opinions. Moderate reviews are considered more significant because they may be a signal of objective assessment (Chua and Banerjee, 2014; Mudambi and Schuff, 2017). Conversely, negative reviews are deemed as more meaningful for consumers because of the occurrence of negativity bias, which is the tendency of considering negative feedback as more diagnostic because reviewers are regarded as more intelligent, knowledgeable and critic about the product (Folkes and Sears, 1977). In fact, being online reviews positive on average (Chevalier and Mayzlin, 2006), consumers look for negative reviews when they need more practical information, especially with experience goods, as they may reduce quality uncertainty (Kim, Ferrin, and Rao, 2008; Wu, van der Heijden, and Korfiatis, 2011). Nevertheless, negative reviews may catch the attention more easily because they seem to carry new pieces of information, but attention is not a unique signal for useful information (Wu et al., 2011). Some academics assert that moderate reviews are more useful than extreme ones, while others declare that extreme negative ones are the most diagnostic also because the studies introduced so far investigated the issue of helpfulness reviews in different economic fields. One of the aims of the present study is to explore these contradictory theories within the literature sector in order to determine which one can be employed.

Besides reviews extremity, reviews depth is the other aspect affecting perceived diagnosticity about reviews, that is potential buyers' perception of the ability to disclose information which can help consumers to better assess products' characteristics and performance (Filieri, 2015). The depth of the information carried by reviews includes relevance, accuracy, and comprehensiveness of the reviews, the themes covered and the language adopted. These features are explored in this paper through the analysis of reviews length, content analysis of most popular themes and most common words. The degree of reviews depth affects the perceived diagnosticity of information, which also raises consumers' confidence in concluding the decision-making process (Mudambi and Schuff, 2017).

2.7 Chronological bias

Reviews perceived diagnosticity is not only affected by features of the reviews such as stars ratings, the content or the length of the comment, but it may also be biased by the functioning of the feedback system. Amazon website allows consumers to decide how to display reviews since for many items there are hundreds or thousands of reviews organized in several pages. The choice is between most recent reviews and "top reviews" that are the reviews with the higher number of helpfulness votes. If the consumer does not change the settings, Amazon shows top reviews first. Having the possibility to choose implies that new reviews are not generally rated as the most helpful. For this reason, the present research examines also the hypothesis of timelines bias so that old reviews are perceived more diagnostic than new ones due to winner circle bias and early bird bias. The former represents the trend among reviews for which more rated reviews will obtain even more helpfulness votes. A review that gathered already a certain number of votes captures readers attention and affects their objectivity regarding the actual content of the review (Liu, Cao, Lin, Huang, and Zhou, 2007). The latter happens when the first reviews posted receive more helpfulness votes because those reviews are available to potential consumers for a longer period of time (Liu, et al., 2007). This aspect is particularly important in the books sector as this type of experience goods remains in retail websites for a very long time, conversely movies whose screenings are available only for few weeks or months. Early bird bias is also affected by winner circle bias (Li M., Huang L., Tan C., Wei K., 2013). In fact, due to default settings of Amazon website, consumers read helpful reviews first. The present study analyses also the presence of chronological biases in order to give a comprehensive overview of factors that affect perceived diagnosticity of reviews in books retail websites.

3. Methodology

The previous chapter reported a critical overview of the theories supported in the literature so far. The present chapter introduces the methodology employed in this exploratory study on perceived diagnosticity of books online reviews. The research was conducted using a mixed method as the research question requires both to test the existing theoretical framework which is typical of the quantitative methods and to elaborate new concepts after the data analysis, like in qualitative methods (Bryman, 2012). On one hand, the sub-question about the written comments in online reviews investigates the relationship between specific themes and reviews helpfulness for which it was necessary to read online reviews and then conceptualize first and include them among the actual theories. On the other hand, testing the validity of the relationships between numerical data about stars ratings, dates, and reviews length and helpfulness votes reckon a statistical analysis of the data with graphs and tables.

3.1 Sampling

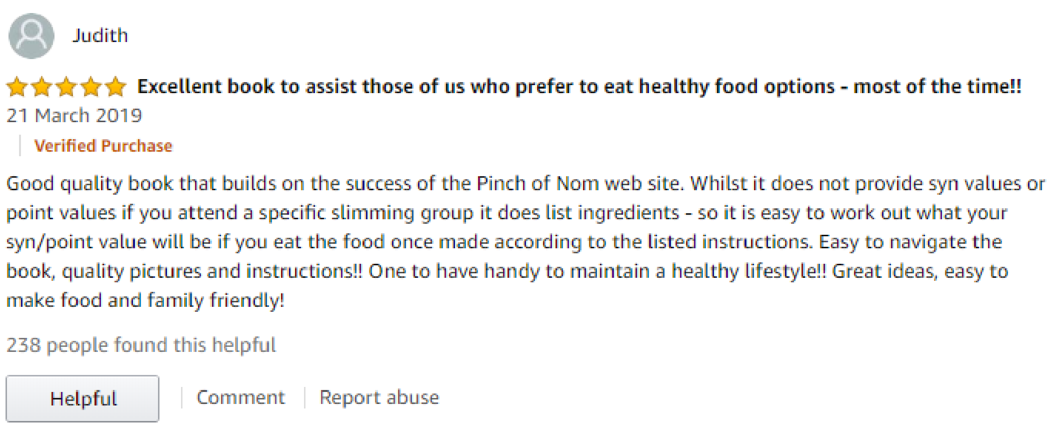
The data set consists of all the reviews posted on Amazon.co.uk on the page of the first five bestsellers of the ranking on 13th May 2019. On that date, the number of English books that were available for purchase on the website were ninety thousands, which means that all the available reviews for those books were the potential units of analysis. Since this research is an exploratory study which examines for the first time the relationship between all the different features that constitute a review altogether, a sample of five bestsellers can be considered reliable. The final sample consists of 12,670 online reviews. As the data has been collected by the researcher directly from the website on a particular date, they can be considered as primary data. The sample include English books of every genre, including non fiction and recipes books. The research is concentrated only on English books because all the reviews are in English. Most of the books have thousands of reviews so they represent a reliable sample. Only two of them have less than one hundred reviews.

Table 1 - English Bestsellers on Amazon.co.uk on 13th May 2019

	Ranking Position	Title	Number of Reviews	Release date
Book 1	1	Pinch of Nom	4544	03/21/19
Book 2	2	You Got This	19	05/02/19
Book 3	3	Confessions of a Menopausal Woman	70	04/04/19
Book 4	4	Hinch Yourself Happy	3054	04/04/19
Book 5	5	This Is Going to Hurt	5745	04/19/18

Book 1 is a recipe book written by two bloggers who create recipes for people who want to lose weight following particular diets and lifestyles that are particularly popular in the United Kingdom nowadays. Book 2 is a guide for teenagers and their mothers about women self-esteem and bravery, written by a famous English writer for teenagers. Book 3 belongs to a genre which is quite popular in the UK, which is medical-related biographies or fiction. Particularly, it narrates the story of a middle age woman facing menopausal diseases. Book 4 is a guide for house jobs written by a notorious English influencer who talks about cleaning habits and gives tips for her followers. Book 5 is the narration of the writer's experience as a junior doctor working in a public hospital in the UK, focusing on weird medical cases and stressing working hours.

Image 1 - Review posted on Amazon.co.uk regarding book 1


Judith

Excellent book to assist those of us who prefer to eat healthy food options - most of the time!!

21 March 2019

Verified Purchase

Good quality book that builds on the success of the Pinch of Nom web site. Whilst it does not provide syn values or point values if you attend a specific slimming group it does list ingredients - so it is easy to work out what your syn/point value will be if you eat the food once made according to the listed instructions. Easy to navigate the book, quality pictures and instructions!! One to have handy to maintain a healthy lifestyle!! Great ideas, easy to make food and family friendly!

238 people found this helpful

Helpful | Comment | Report abuse

The reviews include the stars rating, the title, the date, the body of the text, and the helpfulness votes (See Image 1). The star rating allows reviewers to give up to 5 stars to the item. 1 and 2 stars are extremely negative reviews, while 4 and 5 stars are extremely positive reviews. 3 stars ratings are moderate reviews. For this research, the titles were included in the written body of reviews to count words and code themes.

The reviews were collected using a software wrote in Python that allows to scrape[3] data from websites. The software enabled to download all the reviews in a short time during the same day so they are not biased. However, for Book 5, the software was not able to scrape all the 5,745 reviews, because Amazon allows consumers to visualize only the first five thousands reviews. Even though the website shows the actual number of reviews for each book, in case these reviews exceed five thousands, they are not accessible. The scraped reviews were printed by the software in a csv document, which separates each field (title, date, comment, helpfulness votes) using a comma. The csv documents were run in other Python software to count words, then they were organized in tables on OpenOffice Calc in order to better analyse the data during the quantitative analysis phase.

3.2 Reviews Themes

The reviews were analyzed firstly for their written content, in order to assess what kind of information they provide and their importance for other consumers. The first one hundred reviews of each book were read entirely and coded by hand so that the point of theoretical saturation was reached and the most important and frequent themes emerged (Bryman, 2012). There are six main themes that occur often in the body and title of the reviews of every book, which are *delivery services, reviewers' feelings, book content, information about the author(s), disappointment and desire of returning the book*, and *positive characteristics of the book*. Once the coding was completed, the most common words for each theme were clustered in order to calculate how many reviews covered the same theme and how many helpfulness votes they gathered. The most frequent themes were compared among the most five helpful reviews for each book in order to assess whether there is a common pattern in the reviews' content for every book. Specifically, the research aims to understand if the same themes lead to high helpfulness votes in all the books if all the outliers reviews which gathered an outstanding number of helpfulness votes cover the same themes.

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[3] Web scraping is the practice of using a computer program to sift through a web page and gather the data that you need in a format most useful to you while at the same time preserving the structure of the data. Retrieved from: https://docs.python-guide.org/scenarios/scrape/ .

3.4 Reviews Length

The body of the reviews was studied not only for its content, as themes and words used in the comments, but also considering the length of the reviews employing formulas on OpenOffice Calc. The length was first determined using the formula =LEN(TRIM(A1))-LEN(SUBSTITUTE(A1;" ";""))+1 in order to calculate the number of words included in a review eliminating the spaces between words. The research puts in correlation the number of words with the helpfulness votes. Since the most helpful comments have hundreds of votes, they resulted as outlier in the graphs so it would have been necessary to remove them. However, reviews with the highest diagnosticity rate are particularly interesting for the research so the helpfulness votes were translated in logarithms so the interval in the scale would be smaller. In fact, the researcher tried first to modify the variable in log10 with the formula =LOG10(A1) but the scale was still not clear so the final results are shown in natural logarithm using the formula =LN(A1). Looking at the graphs and at the tables, it was possible to see also graphically the relationship between reviews length and the number of helpful votes, which function corresponds to a logarithmic function with a natural logarithm added of a numerical value.

The data about reviews length were employed also to compare the mean of reviews length for each book, the mean of length for positive and negative reviews, to see whether the latter or the former results higher than the general mean. The same comparison was made also among the means of all five bestsellers.

3.5 Stars Ratings

After analysing the written content of online reviews, the analysis focused on other features, such as stars ratings and posting date. The reviewers can rate the item using one to five stars. 1-star reviews are extremely negative, 5-stars reviews are extremely positive. First, the mean of stars ratings among all the reviews for a certain book was calculated through the formula =AVERAGE(A:A), where A:A indicates the area in which the formula has to be applied so that it prints the mean of all the items included. Then, using the formula =COUNTIF(A:A;X) the researcher determined the number of reviews for each number of stars in order to assess whether there exist more positive, negative or neutral reviews and which is the rate of difference among them. A:A indicates again the area where the formula is employed and X is the item that determines whether that cell has to be counted or not.

Then, given the area A:A where to search for the item X, and given the area B:B where to sum the items if X was found, the formula =SUMIF(A:A;X;B:B) prints the number of helpfulness votes for each stars rating. For instance, the total amount of helpfulness votes for five stars ratings reviews for Book 1 was 11,804, while for 1-star ratings it was 1,795.

Eventually, the researcher determined the mean of helpfulness votes for each review with a certain stars rating. The formula employed was = (N° of Helpfulness Votes of Reviews with x stars)/(N° of Reviews with x stars). The result produces the average of helpfulness votes given to a review with x number of stars. For example, since for book 1 there were 4,135 reviews with five stars, the mean of helpfulness votes was 2.85. If the average number of helpfulness votes for 1-star reviews is higher than the average number for 4-stars reviews, 1-star reviews are generally perceived as more diagnostic than 4-stars reviews. This step is necessary to establish whether there is a negativity bias and if extreme reviews (1-star or 5-stars reviews) are more or less diagnostic then moderate reviews (3-stars reviews). Thanks to column graphs and tables it was possible to intuitively see and understand the trend of the correlation between stars ratings and helpfulness votes.

3.6 Reviews Date

The research focuses then on the correlation between the date the reviews were posted and the number of helpfulness votes they received. First, the reviews were divided according to the date they were posted in order to assess whether reviewers post more reviews on the days immediately following the release date of the book or later. The formula that was employed is =COUNTIF(A:A;01/01/2001) where A:A refers to the column in which were collected all the dates, the date refers to the day for which Calc has to count the number of reviews. Then, the formula =SUMIF(A:A;01/01/2001;B:B) sums the number of helpfulness votes in the column B:B for all the reviews posted on the same date. Having divided the amount of helpfulness votes per days, the graph shows if early birds reviews tend to receive more or fewer helpfulness votes than late reviews. This step allows to determine also the existence of winner circle bias.

The analysis of the relationship between reviews' date and the number of helpfulness votes concludes the research of this study. The study aims to find a positive relationship between all these three variables and the helpfulness votes. The existence of this positive relationship means that those variables influence consumers' perceived diagnosticity when purchasing books. Moreover, it would be interesting to investigate the relationships between all these reviews and helpfulness votes with a multivariate regression but it was not feasible due to time constraints. Eventually, it has to be mentioned that since the sample includes only items from the upper part of the bestsellers list and not from the bottom, it is not possible to generalize and affirm that there is a positive correlation between the features covered by this study (and so perceived diagnosticity) and sales.

4. Findings

The aim of the research is presenting a comprehensive overview of the factors that affect perceived diagnosticity on books online reviews. First, thanks to the content analysis the research intends to disclose the most significant and helpful themes for potential consumers when looking for information about a book in verbal comments of online reviews. The statistics produced by the second part aims to discover the trends about reviews length, reviews stars ratings and dates in books online reviews. All these variables were studied in function of helpfulness votes of reviews in order to disclose the relationships between them and perceived helpfulness (or diagnosticity) in online reviews.

Before starting explaining the findings for each section, there are some general remarks that need to be done. First, the number of reviews changes significantly among the five books of the sample. Book 1, Book 4 and Book 5 have more than four thousands reviews each, while Book 2 and Book 3 have less than one hundred reviews. However, being those two books in a higher rank position compared to the fourth and fifth book, they must have higher sales than Book 4 and Book 5 that have more reviews, controverting the theory proposed by Chevalier and Mayzlin (2006), who stated that more reviewed books have also higher sales. One reason that can explain the position within the top five best sellers of Book 2 lies on the possibility of pre-order books on Amazon before the date of release. In this case, consumers would buy books before reading others' reviews. If the book is well promoted, it may sell a lot of copies even without the possibility of reading reviews. Conversely, book 3 was firstly published on eBook and audiobook versions in 2018 and then the paper version was released on the 4th April 2019 so it appeared to be one of Amazon best sellers on 13th May 2019. Even though consumers bought many paper copies recently, being the content of Book 3 in the latest edition the same as in the previous ones, they could have read the reviews written in 2018 for the previous editions. In this case, since the reviews were only a few, the theory of Chevalier and Mayzlin (2006) is not verified. 70 reviews for book 3 had led to higher sales than 3,054 reviews for book 4.

4.1 Stars Rating and Helpfulness Votes

Being stars rating the first feature implemented by websites' feedback systems and the more immediate source of information that consumers can infer from reviews, it has been studied in several economic sectors. There exist theories that are already formulated, such as the positive relationship between high-starred books and higher sales or the existence of biases, i.e. positive bias or negativity bias. Therefore, it was expected to find reviews that are positive on average, both because of the positivity bias and because the sample consists of bestsellers; the existence of a positive relationship between high-starred books and sales means that bestsellers have higher stars rating on average. Extreme negative reviews were also supposed to be the most diagnostic as they supply new information. Moreover, clearly positive or negative reviews' sets were deemed to lead to higher diagnosticity and so higher sales (Purnawirawan et al., 2012). Therefore, being those books best sellers, the reviews' sets are expected to be clearly positive or negative. The results of the analysis are univocal and they seem to confirm the previous studies concerning the relationships between star ratings and diagnosticity. Reviews for each book are positive on average (see Table 4.1 below); particularly, they are extremely positive as most of them have five stars (see Table A in Appendixes), which confirm the hypothesis of Chevalier and Mayzlin (2006) who affirmed that online reviews are positive on average, being affected by a positive bias. Moreover, since most of the reviews are positive and the average is also closed to 5-stars, the reviews' sets for best sellers are confirmed to be clearly positive (Purnawirawan et al., 2012).

Table 4.1 - Stars Rating

	Average Stars Rating	Average N° Help. Votes on Reviews	Average N° Help. Votes 1 Star Reviews	Average N° Help. Votes 5 Stars Reviews
Book 1	4.79	3.06	15.75	2.85
Book 2	4.63	3.05	1	3.24
Book 3	4.31	4.89	28	3.16
Book 4	4.61	4.98	49.09	1.39
Book 5	4.83	1.17	10.73	1.09

Calculating the average number of helpfulness votes for each review in respect of every book, the mean appears to be 3.41 votes for each review. Looking at the results of the study, it is not probable that the helpfulness of reviews affects sales. Notably, reviews for Books 3 and 4 were deemed as more helpful on average than reviews for Book 1 and 2 by consumers but they have lower sales than Book 1 and 2 being in a lower position in the ranking. This result confirms the negativity bias as Books 3 and 4 have the lowest average for stars ratings whilst they have the highest average of number of helpfulness votes for review. Indeed, Book 3 and Book 4 show also the highest average of helpfulness votes for reviews with 1-star ratings. Helpfulness votes are also divided according to the number of stars of the reviews they refer to and most of the votes are given for extremely positive or negative reviews, such as 5-stars and 1-star reviews (see Table A in Appendixes). On one hand, these findings support the expectations and the theory stated by Forman, Ghose, and Wiesenfeld (2008). Extreme (set of) reviews are considered more useful by consumers as they represent a clear signal of good or bad quality, thus they are easier to process. On the other hand, these findings contrast with the thesis of Chua and Banerjee (2014) and Mudambi and Schuff (2017) who posit that moderate reviews (3-stars reviews) are considered more diagnostic because they are more objective.

There is another important data to be noticed. Book 2 represents an exception which distorts partially the data having only 19 reviews, which are mainly 5-stars reviews and only two extremely negative reviews. Even taking into account the deviancy that occurs because of the data of Book 2, the findings support the hypothesis that for experience cultural goods such as books, extremely negative reviews lead to higher consumers' perceived diagnosticity (Folkes and Sears, 1977; Chevalier and Mayzlin, 2006; Kim et al., 2008; Wu et al., 2011). However, the number of helpfulness votes, which represents the degree of consumers perceived diagnosticity, seems to have no effects on the sales as the items with the highest number of reviews helpfulness votes do not occupy the highest position in the sales rankings. Therefore, being negative reviews the most diagnostic ones, books that perform the highest helpfulness votes average are going to sell fewer copies.

4.2 Reviews themes and Helpfulness Votes

Reviews systems are employed by many retail websites because the information provided by others' are considered trustworthy, honest and real (Gerard, 1955; Park and Nicolau, 2014). Nevertheless, what other consumers' write on their reviews has not been completely disclosed yet. The content analysis of books online reviews aims to discover what kind of themes are deemed as useful for consumers in order to conclude their purchase. Reading those reviews, certain themes occur often and reviewers used also similar or identical words to express those themes. The most common and significant themes both in the written comment and in the title of the reviews of the books in the sample are six and they are labeled as *delivery services, reviewers' feelings, book's content, information about the author(s), disappointment and desire of returning the book*, and *positive characteristics of the book*. The six themes are recurrent in all the reviews, including those that did not receive any helpfulness vote, but they are not discussed all together in all the reviews. Most of the reviews cover two or three themes maximum.

Analysing in detail the first five most useful reviews for each book, the research tries to identify and rank those themes according to the relevance given by consumers to reviews that cover these themes. Since customers look for online reviews to acquire more information about the item they want to consume (Madu and Madu, 2002; Raju and Joseph, 2017), particularly for experience goods such as books, themes related to the content of the book, the characteristics of the book and opinions about the writing style of the writer were expected to be the most common topics. As a matter of fact, the main themes that were debated in the most useful reviews are books' content and information regarding the author(s) (see Table B in Appendixes). The content changes for every book as in the sample there are a recipe book, medical-related books, fiction, and non-fiction. The authors are mentioned not only with their names and the third-singular person pronoun, but many reviewers refer to the authors as they were writing directly *to* them and not *about* them using the pronoun "you". Half of the reviews discussed also positive attributes of the books, such as the interesting topic, the quality of the photographs, the style of the author or convenience of the tips. Reviewers disclose also their feelings about books, which is in line with the identity-disclosure theories (Forman et al., 2008; Mudambi and Schuff, 2017).Indeed, self-disclosure is not the most common theme but it is covered in the most useful review for each book, meaning that consumers highly value personal information about the reviewer. Eventually, being negative reviews deemed as highly helpful, among top reviews there are also negative comments in which reviewers wrote about their disappointment regarding the book. Reviewers also write about their experience regarding the delivery service of Amazon.co.uk. It concerns the delivery itself or the conditions of the item. In particular, this theme was found in the most helpful reviews of three books.

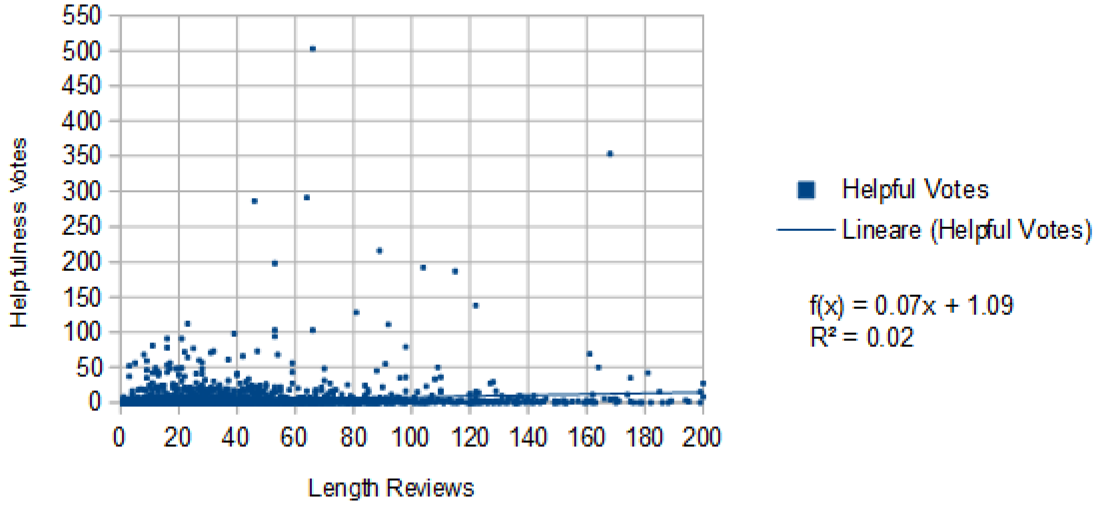
The small sample of only five books, which were only best sellers, does not allow to generalize to all the sector the findings nor to develop a theory about the influence of recurrent themes on the perceived helpfulness of books reviews. However, this exploratory study proposes six themes that can be employed as a basis for a reviews content analysis in wider and more in-depth researches. Notably, the topics disclosed in this section are relevant only to a particular kind of products, that are books, i.e. experience cultural goods.

4.3 Reviews Length and Helpfulness Votes

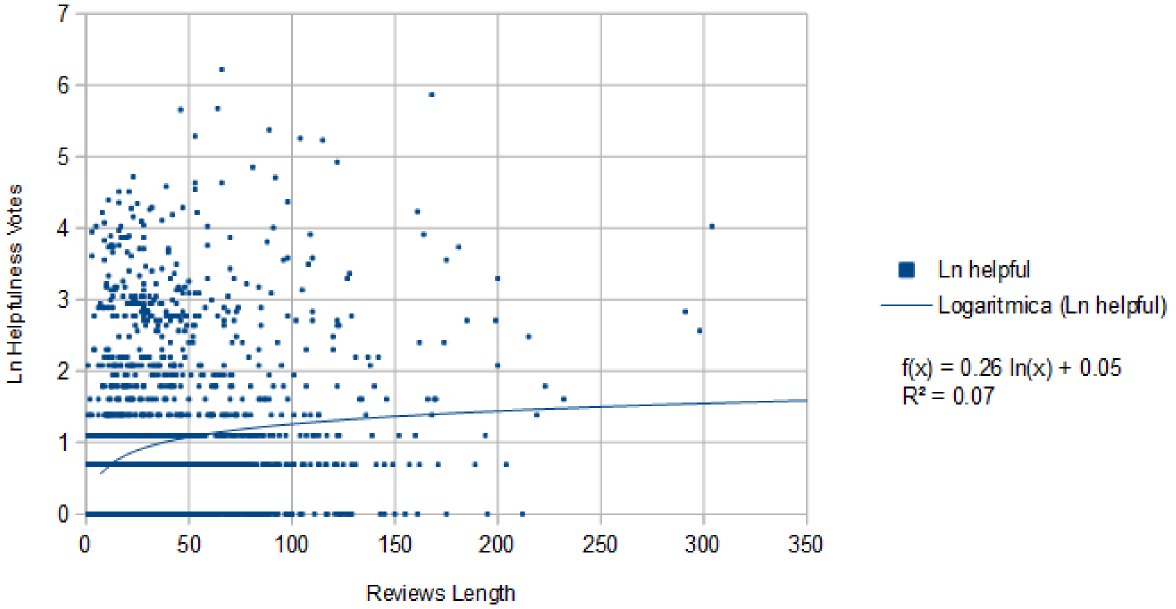
The written comments were analysed not only for their content but also for their length. Since Madu and Madu (2002) posit that not every consumers read the written reviews because they want to find immediate information about the quality of the item, short reviews were expected to be more diagnostic than long reviews as they go directly to the point. However, examining the length of all the online customers' reviews included in the sample as a function of helpfulness votes, the researcher was not able to find a clear correlation. The data collection allows calculating the length average, which is 46 words per reviews. Low reviewed books have longer reviews on average (60 words), whilst high reviewed books have shorter reviews on average (37 words) (see Table C in Appendixes). However, the reviews perceived as more useful are outliers as they are significantly longer than the average (see Table B in Appendixes).

In order to gather an overview of the trend of the relationship between length and perceived diagnosticity, the measures of the number of words and the number of helpfulness votes was shown through a graph. The graph shows that there is a high concentration of reviews close to the zero, so next to the intersection of the two axes. There is a high concentration of reviews that have from zero to one hundred words which also gathered from zero and ten helpfulness votes (see Dispersion graph 1). Longer reviews usually place themselves below the function line, so really close to zero helpfulness votes, whilst shorter reviews reach sometimes fifty or one hundred reviews, placing themselves over the function line (see Dispersion graph 1). For each book, there are outlier points which are far over the average on the vertical axis which represents the number of helpfulness votes. These reviews are usually also longer than the average. To sum up, there is no clear relationship followed by all the reviews, but it is possible to identify a general trend. The function for each book has a coefficient for the independent variable which ranges between 0,05 and 0,1 so there is a little slope (see Table C in Appendixes). A bigger increase in the word count slightly increments the number of helpfulness votes for that review.

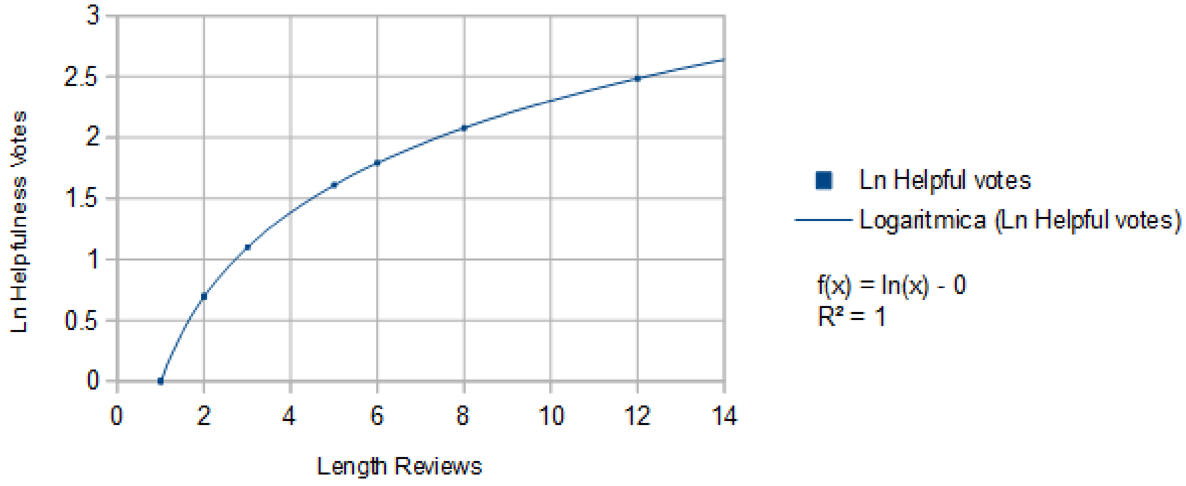
Dispersion graph 1 - Book 1: Relation between length and helpfulness votes



Dispersion graph 2 - Book 1 : Relation between length and ln(helpfulness votes)



Dispersion graph 3 - Book 2: Relation length and ln helpfulness votes



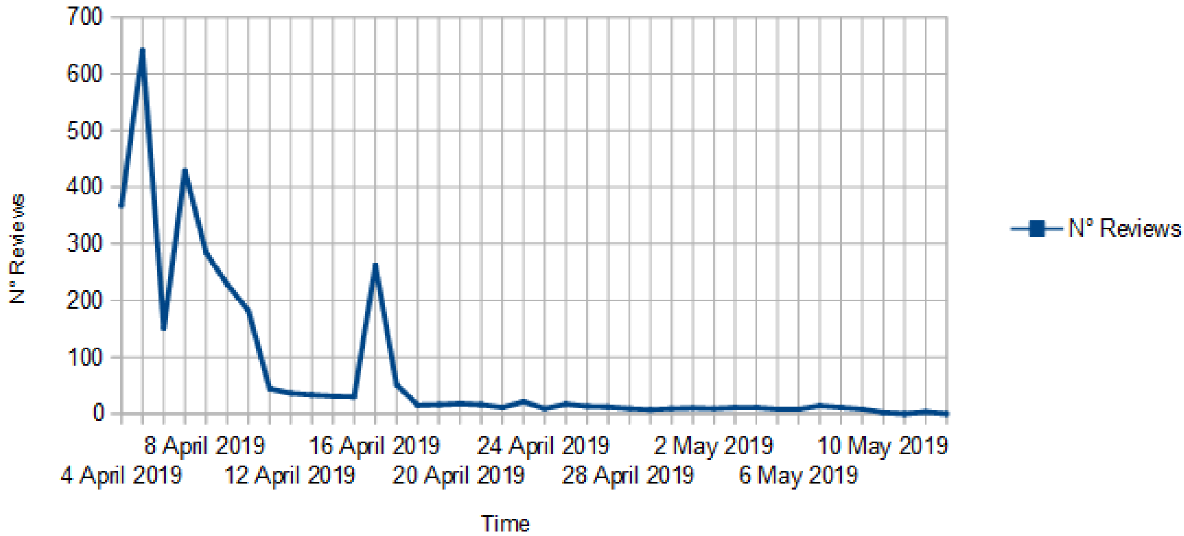
In order to have a better understanding of the phenomenon, the researcher tried also to transform the sums of helpfulness votes for each review in natural logarithms so that even outlier points would be graphically closer to the average. However, this solution does not provide new insights. Many reviews lies on the horizontal axis, meaning that both long and short reviews can receive zero helpfulness votes and there is no direct proportion. The remaining reviews position themselves in straight lines, especially around one and two points in the scale of the vertical axis (see Dispersion graph 2). This analysis suggests that most of the reviews gathered between 3 and 5 helpfulness votes each, which confirms the results of the calculation about the average of helpfulness votes for each review, but it does not provide any new insights. Notably, the graph shows a perfect transposition of a natural logarithmic function only for book 2, which has only 19 reviews (see Dispersion graph 3). This peculiar result may be explained thanks to the small number of reviews which were available for a short period of time, so the time elapsed was not enough for reviews to reach peaks of helpfulness votes. However, the small number of reviews for book 2 does not represent a reliable sample in order to assess the validity of the theory.

4.4 Reviews Date and Helpfulness Votes

The date in which the reviews were posted cannot be properly included as part of the reviews, yet it may affect reviews perceived diagnosticity. The theory states that the older the review, the higher the number of helpfulness votes; nevertheless, the correlation between the date the reviews are posted and the perceived diagnosticity may be problematic for experience good such as books. Firstly, some reviews are posted exactly on the date the book was published. Since for experience goods such as books customers should consume the good before assessing the quality, they should have read the book in one day. Secondly, assuming that consumers have actually done so and they did not post reviews before having finished the book, the theory says that those reviews should gain more helpfulness votes than all the following ones.

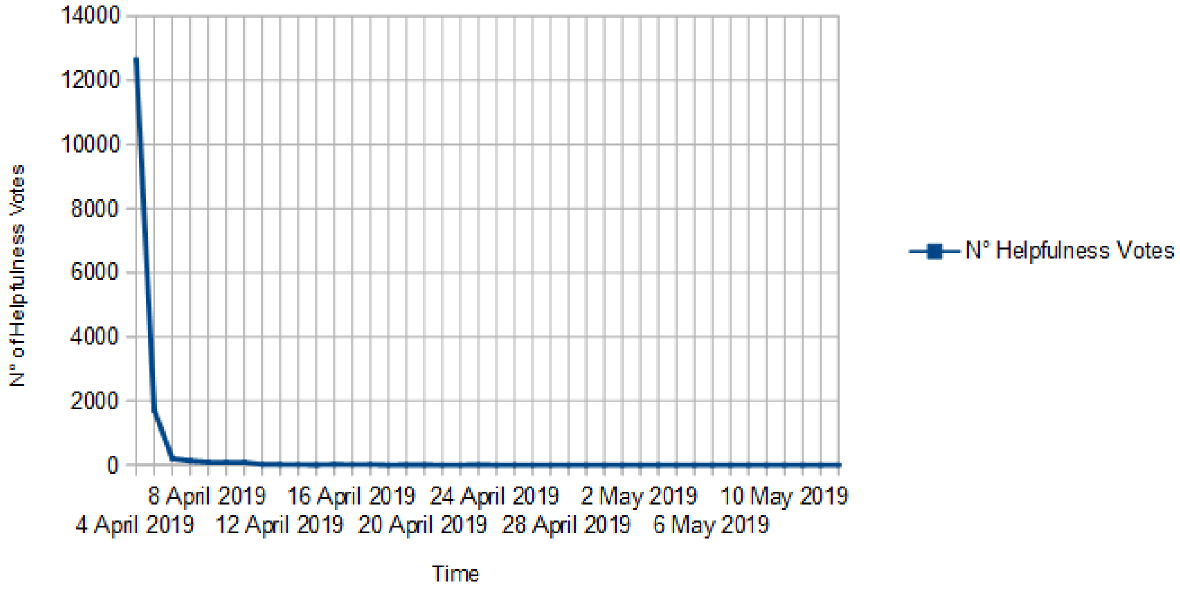
Once the reviews were divided according to the date they were posted, it seems that for most of the books in the sample, most of the reviews were posted during the week which follows the publishing date. After this week, the number of posts starts decreasing. However, the decrease is not steady because there exist peaks, usually after two or three weeks after the publishing date (see Line graph 1).

Line graph 1 - Book 4: Number of posted reviews per day



The number of helpfulness votes follows a similar trend, but once the graph reaches the first peak during the first week, the trend looks like an exponential function with a positive coefficient (see Line graph 2). Notably, the trend of posted reviews is different from the trend of helpfulness votes. Consumers tend to write more reviews in the first weeks after the publishing date but the graph displaying the number of reviews posted per day does not decrease steadily but it remains constant slightly above the zero. Reviews posted immediately after the publishing date reach the highest number of helpfulness votes on the graph, then the line drop and the line graph ends persisting just above the zero for late reviews, meaning that late reviews gather few votes each.

Line Graph 2 - Book 4: Number of Helpfulness Votes according to the date of the reviews they refer to



The data about the date when reviews are posted prove the existence of early bird bias (Li M., Huang L., Tan C., Wei K., 2013) as the number of helpfulness votes of reviews posted immediately after the publishing date is higher than the number of votes for reviews posted afterward.

Moreover, older reviews may be affected also by winner circle bias (Li M., Huang L., Tan C., Wei K., 2013). Since the first reviews were read by more customers who looked for information about the book later, they acquired more votes. Having more votes than the new reviews, they also received more attention because Amazon displays top reviews in a higher position in the reviews section of the website in the default option, starting a vicious circle which makes them having even more attention. Being in the first position, more consumers are going to read them, also those who do not want to articulate extensively their decision-making process and usually concentrate only on stars ratings (Madu and Madu, 2002).

5. Conclusions

Since the present research is an exploratory study that employs mostly quantitative method and partially qualitative method, it was supposed to verify or reject existing theories about perceived diagnosticity of online reviews applying them to books, particularly to best sellers. Moreover, due to the size of the sample of the analysis, the findings of the qualitative research cannot be generalized creating a new theory, but the research presents only few hypotheses that can be exploited with further and wider studies.

Firstly, according to the theory, books reviews are positive biased, which is not only a consequence of herd behavior in consumption of cultural goods, as consumers trust others' information and decision (Bonabeau, 2004), but it is also due to the behaviour of satisfied customers who return to the platform and write a review. In fact, non-satisfied consumers do not have the same incentive (Tadelis, 2015)**.** Even though online negative reviews carry criticism about the quality of the product, those reviews reduce the quality uncertainty (Kim et al., 2008; Wu et al., 2011). Negative reviews represent a good signal for the website as they increase consumers' perceived diagnosticity about the reviews provided by previous customers, which affect the perception of the entire website.

Being books experience goods, consumers' should search for more information about the features of the book because of the quality uncertainty (Raju and Joseph, 2017) and the results confirmed this theory. Firstly, most of the reviews concern books' content. Even though they can find the description of the books also on the website, consumers trust more information provided by peers, confirming the thesis carried by Park and Nicolau (2014). Significantly, the most useful reviews do not concern the positive characteristics of the book. Secondly, self-disclosure about feelings is proved once again to be one of the themes that are valued the most by consumers (Mudambi and Schuff, 2017).

If reviews content appears to have a great influence on consumers' perceived diagnosticity, reviews length is not a certain proxy for reviews helpfulness. Therefore, what consumers value the most is rather reviews content and its quality than the quantity of the information provided. Too long reviews are usually not perceived as useful, so retail websites may consider to regulate the maximum amount of words for reviews in order to improve the perceived diagnosticity of their reviews as the type and quality of information are more important than the length.

The peaks of reviews during the first week of sales can be explained by the enthusiasm of readers who have read the book immediately, making the book reaching a high position in the bestsellers list. Later, the herd behavior increases the interest of other consumers' who notice that the book has been bought by many readers and has a lot of reviews.

Herd behavior and the winner circle bias explain the high number of helpfulness votes received by reviews posted in the first days after the publishing date. In fact, since people follow others' decisions due to the possibility that others have more information than they do, consumers also tend to perceive the first reviews as more diagnostic, since early birds may have had more information.

5.1 Limitations and further research

The initial idea was to compare features of online reviews of books from Amazon websites of different countries in order to assess whether there exist different features affecting consumers perceived diagnosticity in different Amazon websites. However, most of the reviews on these websites were in Spanish, German, French and Italian so translation was needed. Since the peculiarity of specific words and some differences in meaning would be lost in translation, the research sticks to English reviews of best sellers from Amazon.co.uk so that the analysis is more clear and consistent.

The present research is an exploratory study so it is necessary to repeat the research with a wider sample in order to confirm the existence of a pattern of themes and the relationships between helpfulness and reviews length, stars ratings and date. A study which includes both bestsellers and non-bestsellers may disclose further insights or confirm the presence of similar outcomes. Moreover, due to time constrictions it was not possible to extend the study to a multivariate analysis, such as a multivariate regression, including all the variables that were investigated separately so far.

A further limitation was found in the data about Book 2, which had only 19 reviews posted on the date of data collection. The reviews of this book were not excluded from the sample because it was expected to confirm the patterns encountered analysing the reviews of all the other books in the sample. It may be considered as a bias, but it may also carry data which represent an exception, giving to the research a more authentic representation of the reality. Furthermore, it provides an argument to investigate with further research the topic at hand. The graph of the logarithmic function of helpfulness votes of Book 2 represents a perfect natural logarithm. Having a small sample of reviews, this result may be biased and not reliable. However, it might be interesting to repeat the analysis with a wider sample of books (and reviews) in order to assess to what extent this trend returns in reviews of other books.

The study leads to further research on the validity of the findings also for books that are not in top position in the bestsellers ranking, exploring more the relationship with books sales. In fact, the effects of stars rating, reviews themes and length and the date when those reviews are posted may be different according to genres or position in the ranking.

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APPENDIXES

Table A - Means helpfulness votes according to stars rating

	Book 1	Book 2	Book 3	Book 4	Book 5
5 Stars	2.85	3.24	3.16	1.39	1.09
4 Stars	0.62	0	11.5	0.47	0.4
3 Stars	0.75	0	1	9.26	1.39
2 Stars	2.34	2	4	10.83	3
1 Star	15.75	1	28	49.09	10.73
Mean	3.06	3.05	4.89	4.98	1.17

Table B - Themes and Helpfulness Votes

		Delivery	Feelings	Content	Author	Disappointment	Pos. charact.	Helpful. Votes
Book 1	R 1	1	1	1				503
	R 2	1	1	1	1		1	353
	R 3			1		1		291
	R 4					1		286
	R 5			1			1	216
Book 2	R 1		1	1	1		1	12
	R 2		1	1	1		1	8
	R 3			1	1		1	6
	R 4			1	1		1	5
	R 5		1	1	1		1	6
Book 3	R 1		1	1	1	1		136
	R 2			1	1		1	25
	R 3		1		1		1	18
	R 4			1	1			12
	R 5		1	1	1		1	10
Book 4	R 1	1	1		1			808
	R 2			1	1			563
	R 3			1				459

	R 4					1		441
	R 5			1	1			976
Book 5	R 1		1	1	1	1		168
	R 2		1	1	1			98
	R 3	1		1	1		1	96
	R 4			1	1		1	78
	R 5			1	1		1	76

Table C - Relation length and helpfulness votes

	Average Length	Average N° Reviews	F(x) Helpfulness Votes	Ln(x) Helpfulness Votes
Book 1	29	3	f(x)=0.07x+1.09	f(x)=0.26ln(x)+0.05
Book 2	68	3	f(x)=0.05x-0.06	f(x)=ln(x)
Book 3	53	4.9	f(x)=0.1x-0.27	f(x)=0.33ln(x)-0.14
Book 4	48	5	f(x)=0.05x+2.42	f(x)=0.04ln(x)+1.24
Book 5	34	1.2	f(x)=0.07x-1.3	f(x)=0.5ln(x)-0.98