

Choice Anxiety in Decision Making: Why People Turn to Strangers for Information

Research-in-Progress

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Abstract

This research-in-progress examines the conditions that cause individuals to rely on electronic word of mouth (eWoM) when making purchasing decisions. I theorize that, paradoxically, turning to strangers for information gives individuals a sense of control in a decision environment characterized by overwhelming amounts of alternatives and prevailing information asymmetries. Building on information systems (IS) literature examining questions of usage from both intentional (conscious) and automatic (subconscious) prisms, I introduce the notion of choice anxiety. I propose a model testing the extent to which subconscious choice anxiety, together with adverse selection avoidance is associated with an individual's sense of control rising from reliance on eWoM information. Analysis of the data shows strong association between cognitive level variables and subconscious choice anxiety with use of eWoM information as a mechanism for achieving sense of control. I theorize that the emergence of choice anxiety and its successful resolution triggers a classical conditioning that reinforces an individual's reliance on eWoM information sources, thereby contributing to their institutionalization.

Keywords: Choice Anxiety, eWoM, Information Asymmetry, Purchasing Decision Making,

Introduction

The ability to learn from other's experience and knowledge allows individuals to survive in uncertain environments (Nowak and Sigmund 2005). Conventionally, individuals relied on two sources of information to support decision making: personal networks and official authority sources (Palla et al. 2007). In the mid-20th century, however, marketing researchers began to document how unofficial sources in the form of word of mouth (WoM) impact individual purchasing behavior (Brooks 1957; Whyte 1954) and in recent years, researchers have turned their attention to the increasing impact of electronic word of mouth (eWoM) in the form of online blogs, discussion forums, reviews sites and feedback mechanisms (e.g. Anderson and Magruder 2012; Chevalier and Mayzlin 2006; Gu et al. 2012; Pavlou and Dimoka 2006). The institutionalization of eWoM is widespread and it has become a primary information source for an increasing number of prospective consumers, yet it is not entirely clear why it happens. I propose that subconscious choice anxiety that emerges during the decision making process, together with cognizant adverse selection avoidance, explains acceptance of and subsequent institutionalization of eWoM.

The past decade of literature presents three streams of eWoM research. The first stream examines the impact of eWoM on decision making and purchasing behavior with conflicting results. Some find evidence eWoM has an impact (e.g. Anderson and Magruder 2012; Cabral and Hortacsu 2010; Chevalier and Mayzlin 2006; Gu et al. 2012), while others find no impact (Duan et al. 2008; Chen et al. 2004; Ghose 2009; Liu 2006). The second stream looks at the theoretical and practical value of eWoM as an information source, also with inconclusive results. Some assert eWoM is an important information asymmetry mitigation mechanism that helps reduce adverse selection and moral hazard (Ba and Pavlou 2002; Dellarocas 2005; Pavlou and Dimoka 2006), while others question the value of eWoM as an information asymmetry mechanism (Ghose 2009), asserting it is inflicted with self-selection bias and herd behavior (Hu et al. 2006; Li and Hitt 2008), as well as persistent manipulation (Mayzlin et al. 2012; Luca and Zervas 2013). The third stream looks at the different dynamics and interactions of eWoM, focusing on a variety of issues such as the relationship between identity disclosure and perceived usefulness of eWoM information (Forman et al. 2008), the impact of user subscription on eWoM information providers (Goes et al. 2014), gender differences in eWoM consumption (Awad and Ragowsky 2008), and more. Though insights from all those streams of research increase our understanding of the impact, value and mechanics of eWoM, they do not sufficiently explain why so many individuals are willing to follow complete strangers when deciding on how best to allocate their scarce resources to begin with. Researchers generally agree that individuals turn to eWoM to reduce uncertainty (e.g. Hu et al. 2008; Mudambi and Schuff 2010); however, this explanation is insufficient as it does not address the tension between "product uncertainty" (Dimoka et al. 2012) and "stranger uncertainty", the human, evolutionary-ingrained, suspicion of strangers (Schenk 1987).

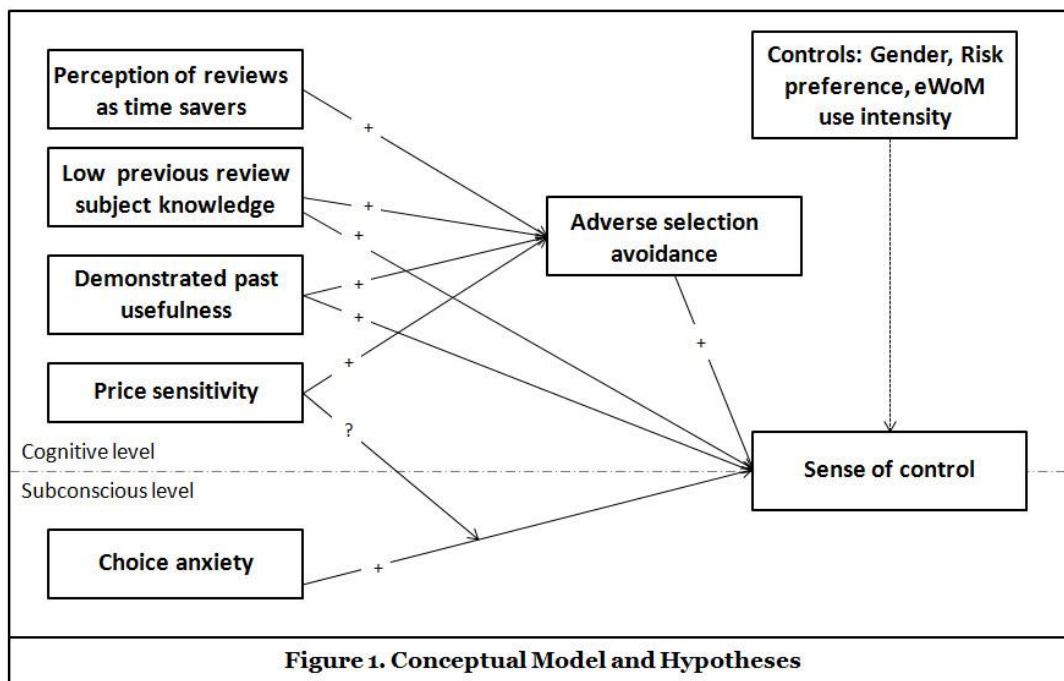
Motivated by this gap in eWoM theories, I follow Alvesson and Sandberg's (2011) method of problematization to find a more complete theoretical explanation of eWoM usage and institutionalization. The core theoretical proposition driving this research asserts that individuals rely on eWoM information because it restores a sense of control over a purchasing process that is often cognitively and emotionally overwhelming. IS scholars increasingly recognize that usage of IT is often driven by both intentional (cognitive) and automatic (subconscious) factors (De Guinea and Markus 2009; Limayem and Hirt 2003; Shin 2007), and I theorize that eWoM use represents an activity geared toward the restoration of a cognitive and emotional balance.

Given the research objective of understanding the factors leading individuals to rely on information provided by strangers for making purchasing decisions, I develop a contextualized model that takes into account the environmental conditions in which the IS in question is used. Specifically, the model takes into account that eWoM usage occurs at the time prospective consumers try to make a decision regarding a potential purchase. The multitude of options available inevitability increases the risk for adverse selection, but information asymmetry mitigation is not the only reason why consumers rely on eWoM. Digging deeper, I introduce the new construct of "choice anxiety" - an underlying stress emerging as a result of the availability of multiple substitution options - and juxtapose it with individual reliance on eWoM. The notion of choice anxiety is discussed online by non-academic blogosphere thinkers (for instance see, Ridley 2011; Salecl 2013; Shelley 2011), yet it currently does not receive attention in academic research. In this study, I theorize that choice anxiety is directly associated with individual sense

of control resulting from reliance on eWoM, and suggest that prospective consumers, at least in part, use eWoM as a mechanism for combating stress they do not necessarily know exists. I further theorize that the process of stress emergence and stress alleviation creates, through classical conditioning, a self-reinforcing cycle that contributes to the institutionalization of eWoM over time as its users gradually become psychologically dependent on it.

Conceptual Model

Drawing on the notion of bounded rationality (Simon 1982) and IS literature showing that technology usage is in part driven by subconscious emotional factors (De Guinea and Markus 2009; Limayem and Hirt 2003; Shin 2007) to inform the theoretical model, I propose that systematic reliance on eWoM is driven by *cognitive* level considerations as well as *subconscious* impulse. The proposed conceptual model (Figure 1) examines the relationship between cognitive level rational considerations and use of eWoM information as an adverse selection avoidance mechanism as well as the relationship between adverse selection avoidance and emerging subconscious *choice anxiety* with individual level sense of control over the purchase process resulting from reliance on eWoM information.



Sense of Control

The model's dependent variable is defined as the extent to which an individual feels a sense of control over the purchase process as a result of access to eWoM information. Having a sense of control over life events is directly linked to mental and physical wellbeing (Lachman and Weaver 1998; Rodin 1986), and in this study I theorize that reliance on strangers for information increases individual level sense of control in a purchasing environment that is often cognitively and emotionally overwhelming. Sense of control is placed on the seam between the cognitive and subconscious level as it can be achieved through awareness (such as a rational avoidance of undesirable options) as well as by a restoration of subconscious homeostasis through coping mechanisms operating beyond immediate awareness (Baumeister 2002; Freud 1922).

Subconscious Level

The vast majority of mental activities in the human brain occur far beyond the level of accessible cognitive awareness (Freud 1922; Jung 1921). Both, bounded rationality economics and IS research assert that

individuals are driven by non-rational (or emotional) factors when making decisions and using technology (De Guinea and Markus 2009; Simon 1982). In this study, I propose one such factor.

Choice anxiety: I define choice anxiety as the extent to which an individual feels anxious and overwhelmed when facing multiple choices. The notion of choice anxiety is derived from the paradox of choice theory (Iyengar and Lepper 2000; Schwartz and Klivan 2004), which looks at the tension between the socially ingrained cognitive belief in the desirability of unlimited choice and the growing body of evidence clearly demonstrating that as individuals face more choices they are more likely to become emotionally paralyzed and subconsciously unhappy. Multiple choices cause a certain degree of emotional distress as individuals “fear” to commit themselves to a choice while knowing that possibly “better” alternative choices exist (Iyengar and Lepper 2000; Schwartz et al. 2002). Individuals react stronger to losses than gains (Kahneman and Tversky 1984), and the source of choice anxiety is the mental stress caused by the human tendency to see the “path not taken” as a loss.

Cognitive Level Variables

Adverse selection avoidance: Reminiscent of official diplomas and certificates on one’s résumé which are used as information asymmetry mitigating signals by employers to sort among applicants (Spence 1973), eWoM information constitutes a major part of the virtual reputation portfolio of products and services, signaling to prospective consumers which ones deserve consideration and which should be avoided. The role eWoM information play in mitigating information asymmetry is addressed in existing IS research looking at the impact of positive eBay feedback mechanisms on the perceived trustworthiness of sellers and the subsequent willingness of prospective consumers to pay higher premiums (Ba and Pavlou 2002; Pavlou and Gefen 2004). I theorize that adverse selection avoidance through eWoM information usage is a function of four factors: individual price sensitivity, past experience with eWoM, perception of eWoM information as a time saving mechanism and the level of familiarity with the eWoM information subject. I assert that adverse selection avoidance is a rational behavior that leads to a sense of control over the purchase process. I define adverse selection avoidance as the extent to which an individual uses eWoM information to steer clear of undesirable options.

Drawing on transaction costs economics, literature on the impact of budgetary constraints on purchase decisions, research into the impact of past experience with technology on its subsequent use, and theories of the value of marginal information in relation to existing knowledge, I hypothesize four cognitive level antecedent conditions driving adverse selection avoidance and sense of control resulting from eWoM information. While other factors are inevitably in play (for instance, experience with web-surfing), I purposefully focus on those four factors for (a) abiding by the principle of parsimony and, (b) more importantly, because they contextually relate to the action of purchase making and eWoM acceptance.

Perception of reviews as time savers: Transaction costs economics emphasizes search costs as an important factor in all economic activities (Williamson 1979). Whereas access to expert information and personal networks carries a certain opportunity cost, eWoM is only a few clicks away as a relatively inexpensive source of information. Researchers recognize search cost reduction to be one of the major advantages of ecommerce (Jarvenpaa and Todd, 1997; Liu and Arnett, 2000). Similarly, researchers recognize the role of eWoM in reducing consumers’ search costs (e.g. Liu et al. 2011). Hence, I hypothesize that prior to using eWoM as information asymmetry to mitigate adverse selection, prospective consumers must perceive it as a mechanism that reduces their information search costs by saving time. As there is no logical connection between perception of reviews as time savers and sense of control, I hypothesize it only to impact adverse selection avoidance.

Previous knowledge of review subject: Value of information depends on the marginal utility it gives to its appropriator (Grossman and Stiglitz 1980; Martin and Sell 1980) and depends on a person’s previous decision making and purchasing experiences (Bettman and Park 1980; Park and Lessing 1981; Rao and Monroe 1988). Research specifically addresses the role of eWoM in decreasing uncertainty, suggesting that individuals who possess limited information are more likely to use it (e.g. Gretzel and Yoo 2008; Hu et al. 2008). Also, eWoM information is more influential on purchasing lesser known products and services (Zhu and Zhang 2010), suggesting that familiarity with the information subject plays a role in shaping perceived value and subsequent use of eWoM. Hence, I emphasize the extent to which an individual indicates previous knowledge as a driver of eWoM usage. I hypothesize that low previous knowledge is positively associated with adverse selection avoidance and sense of control.

Demonstrated past usefulness: Past experience with IT leads to perceptions of its relative advantage, driving its continuous usage (De Guinea and Markus 2009; Liao and Lu 2008). While existing eWoM research does not directly address the connection between past experience with eWoM information and its usage as an information asymmetry mitigation mechanism for adverse selection avoidance, it nonetheless finds evidence of its impact on purchase behavior (e.g. Beak et al. 2012; Cui et al. 2012), suggesting that demonstrated past usefulness plays a role in the continuous use of eWoM information. For information to be useful, it must be accurate in relation to its subject source (Mingers 1995), thus I define demonstrated past usefulness as the extent to which an individual perceives past eWoM information to prove itself to be accurate. I hypothesize that demonstrated past usefulness is positively associated with adverse selection avoidance and sense of control.

Price sensitivity: Budgetary constraints impact all economic activities, and price has a significant influence on consumers' purchase behavior (Han et al. 2002; Wakefield and Inman 2003). The opportunity cost of making the wrong choice is inversely related to disposable income, driving those who are more sensitive to price to seek information to avoid adverse selection. I define price sensitivity as the extent to which price drives information search. While price sensitivity is hypothesized to be positively associated with adverse selection avoidance, there is no logical explanation to tie it directly with sense of control.

On the other hand, research consistently finds that worrying about money is a major source of stress (Roberts and Jones 2001). Thus it is not clear how high price sensitivity, which is itself a potential source of anxiety, might interact with choice anxiety. I hypothesize that price sensitivity will moderate the relationship between choice anxiety and sense of control, but without predicting the direction of the effect. It is possible price sensitivity might supersede choice anxiety, reducing the strength of its link with sense of control. It is also possible price sensitivity increases the strength of the link between choice anxiety and sense of control.

Control Variables

In the model, I incorporate three control variables: gender, eWoM use intensity, and risk taking attitude. I control for gender because traffic data to major eWoM platforms such as tripadvisor.com and yelp.com, consistently show females to outnumber males. This is consistent with past research showing females to be more likely to turn to eWoM sources for information (Awad and Ragowsky 2008; Bae and Lee 2011). EWoM usage frequency has been studied as a dependent variable in past research (Park and Lee 2009). I control for eWoM use intensity as it is possible that individuals who access eWoM information sources more frequently and read more reviews are also more likely to indicate that it gives them a sense of control over the purchase process. I measure use intensity as a composite variable including self-reported monthly frequency of eWoM information access, number of product categories researched and the number of reviews read prior to making a decision. Finally, I control for risk attitude. Accessing eWoM sources for information represents an activity that is inherently aimed at reducing uncertainty (e.g. Gretzel and Yoo 2008; Park and Lee 2009), and attitude towards risk might impact individual sense of control resulting from eWoM usage.

Research Design

In this research-in-progress paper, I report the results of a pilot study. A survey was filled out by a sample of 111 undergraduate students in a large public university. After the removal of disengaged responses and responses that indicated no use of eWoM, the final sample stabilized at 101 observations. As recommended by Straub (1989), with the exception of the items on risk attitude, all items for this instrument were specifically formulated for testing the proposed model. To develop the survey, I used successive stages of literature review, theoretical modeling, and refinement, as suggested by MacKenzie et al. (2011). All items were measured on seven point Likert scales ranging from strongly disagree (1) to strongly agree (7). To avoid forced responses, each item also had a "not applicable" option. Cronbach's values for all multi-item constructs were above the suggested level of 0.70. 94 percent of respondents indicated that they access eWoM information sources. Average reported monthly use was 5 times, during which an average individual accesses 6.7 reviews. The average age is 21 and 65 percent of the sample were females.

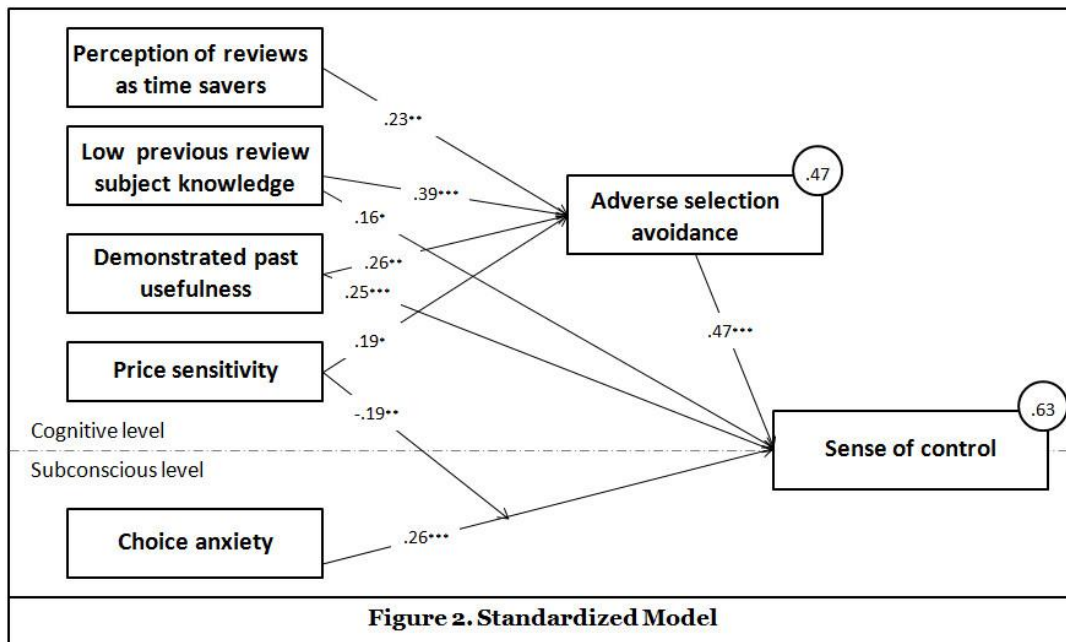
Table 1. Constructs and Measurement Items	
Construct	Measurement Items
Sense of control	SenCon1: Consulting online reviews gives me greater sense of control over the process of selecting a product. SenCon2: Reading online reviews makes me feel in control when shopping online.
Adverse Selection Avoidance	ASA1: I read online user-generated reviews to help me narrow down my choices. ASA2: I read online user reviews to avoid spending my money on something I might later regret. ASA3: Reading online user-generated reviews helps me to stay away from the wrong options. ASA4: I read reviews to assist me to find the right product for me among the many available options.
Choice Anxiety	ChAnx1: I occasionally feel overwhelmed by the amount of choices available to me in stores. ChAnx2: I sometimes get uneasy when having to choose a product among many good alternatives.
Price Sensitivity	PS: The more expensive the product the more likely I am to research it online before buying it.
Time Savers	TS1: User reviews save me time in researching products. TS2: Looking up user reviews speed up my choice making process.
Previous Knowledge	PK: The less I know about the product or service, the more I am likely to consult user reviews prior to making a decision.
Demonstrated Past Usefulness	DPU1: I read online user-generated reviews because they are usually correct. DPU2: I read online user-generated reviews because they proved to be right in the past. DPU 3: From my experience, consumer reviews are accurate in their assessment.

Data Analysis

The model with standardized coefficient is shown in Figure 2. The index of absolute fit was good (Gefen et al. 2000) with a $\chi^2/8 = 13.025$ and a p-value = 0.111. The relative fit tests are good, especially given the relatively small sample size of 101. All indices are consistent with Hooper et al (2008) guidelines, with an NFI= 0.954, CFI= 0.975, IFI= 0.982, and RMSEA = 0.055.

All the hypothesis paths were significant at level $\alpha = 0.05$. The R^2 for adverse selection avoidance and sense of control are 0.472 and 0.634 respectively, indicating that the model explains a good portion in the variance in adverse selection and sense of control. AMOS bootstrapping procedure (1000 samples) confirm mediation as hypothesized. Full mediation of adverse selection in the case of the perception of reviews as time savers and price sensitivity, and partial mediation in the cases of demonstrated past usefulness and previous knowledge. None of the control variables' impacts are statistically significant with regards to the dependent variable. VIF scores range between 1 and 1.4, indicating that multicollinearity is not likely to impact the model results. Future work will focus on further refining the survey items and model specification, yet, overall, the pilot model, even with the relatively small sample size, shows promising consistency and robustness.

The model shows a connection between choice anxiety and a sense of control, confirming the theoretical proposition that, in part, subconscious level anxiety drives individuals to seek information, even from strangers. Adverse selection avoidance is the main cognitive factor influencing individual sense of control from eWoM, indicating that individuals are concerned with information asymmetries in markets to an extent that supersedes their evolutionary ingrained instinct to view strangers with suspicion. Price sensitivity negatively interacts with choice anxiety, indicating that high price sensitivity takes priority over choice anxiety when it comes to feeling a sense of control resulting from eWoM information usage.



Path coefficient significant at: *** $p < 0.001$, ** $p < 0.01$, * $p < 0.05$. R^2 reported in circles.

Finally, to assess the unique effect of choice anxiety, I performed a 4 step hierarchical regression on the data. I entered the control variables in step 1, cognitive level independent variables in step 2, mediator in step 3 and choice anxiety in the final step. The results interpretation is based on the change in F scores, and t -values of individual parameters. The results (summarized in Table 2) indicate that choice anxiety adds significantly to the sense of control derived from usage of eWoM information.

Table 2. Results of Hierarchical Regression Analysis

Variable	Model 1	Model 2	Model 3	Model 4
Gender	.078	-.043	.021	.048
Risk preference	.094	-.070	-.116	-.111
eWoM use intensity	.043	-.022	-.048	-.017
Perception of reviews as time savers		.269**	.175*	.152
Previous knowledge		.308***	.131	.157*
Demonstrated past usefulness		.357***	.231**	.211*
Price sensitivity		0.168*	.107	.103
Adverse selection avoidance			.445***	.432***
Choice anxiety				.205**
F	0.611	12.701***	16.408***	16.993***
ΔF		21.375***	21.920***	9.411**
R^2	0.019	0.494	0.593	0.632
ΔR^2		0.475	0.099	0.039
Adjusted R^2	-0.012	0.455	0.557	0.595

Significant at: *** $p < 0.001$, ** $p < 0.01$, * $p < 0.05$.

Discussion

eWoM use is driven by individual's need to feel in control over their economic decisions in an environment characterized by information asymmetries and availability of many alternative choices. The model shows that individuals who perceive eWoM as a mechanism that reduces their search cost (saving their time), and who are sensitive to prices, possess a low previous knowledge and have positive experience with eWoM are more likely to use it as an adverse selection avoidance filtering mechanism. Subsequently, the model shows that rational adverse selection avoidance together with an emerging subconscious choice anxiety increase individual's sense of control resulting from eWoM use. Psychology literature suggests that individuals are likely to keep turning back to mechanisms that help them cope with anxiety (e.g. Goeders 2003; Sinha 2001). In the context of eWoM, I suggest its acceptance and subsequent institutionalization in recent years can be attributed, at least in part, to its role in resolving individual level anxiety.

Technology acceptance model (TAM) pioneered the notion that psychological factors drive IT acceptance (Schepers and Wetzels 2007), yet it should be acknowledged that multiple, mostly unknown, socio-psychological factors underlie perceptions of ease of use and usefulness (Karahanna and Straub 1999). A better insight into how IT helps in restoring the homeostasis in the face of multiple possible types of anxieties, phobias and psychological defense mechanisms can only enrich our understanding of the hidden factors driving IT acceptance in different contexts.

The proposition that choice anxiety is associated with eWoM access carries practical implications for eWoM system designers, sellers wishing to gain a competitive advantage, and marketers. Websites that employ reputation mechanisms such as ratings and reviews as part of their business model (for instance, Yelp, TripAdvisor, AirBnB), should include features that can help prospective consumers to sort between the reviews, as exposure to multiple reviews can be a potential source of choice anxiety of its own. Amazon.com allows users to rank reviews according to their level of helpfulness and surface the most helpful reviews to the top (Mudambi and Schuff 2010). More eWoM platforms should find similar mechanisms to add value to their users. Sellers of products and services should be cognizant of choice anxiety and avoid overwhelming potential consumers with options. This countertrend strategy can assist sellers in attracting loyal consumers by reducing their choice anxiety while releasing important resources for improving the quality of the products and services offered. Marketers should be more aware of the existence of choice anxiety when presenting products and service options to prospective consumers. Marketing research examining the optimal number of options should be conducted independently for different industries and prior to the launching of marketing campaigns.

The objective of this paper is to add to the understanding of why individuals, contrary to evolutionary instincts, submit themselves to the opinions of complete strangers when making economic decisions online. As such, it adds to eWoM research by explaining what drives its use and perhaps institutionalization, and it adds to economic literature, confirming the importance of information asymmetry as well as search cost in individual purchasing behavior; it also adds to the paradox of choice literature, confirming its existence in a new, previously unexplored, context of eWoM reliance for information. Choice anxiety, as conceptualized in this paper, is a newly identified type of anxiety and a construct. As such, it inevitably must undergo further reassessment and refinement to meet the high validity standards associated with long existing constructs used in research. I employed choice anxiety in conjuncture with eWoM use, but it also can be considered in any other business context in which choices are made in the face of multiple options, including IT selection, stock trading, career path choices, task procrastination and more. This paper puts forward a kernel of theoretical conceptualization that hopefully will prove its usefulness in the study of decision making across contexts.

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