



UNIVERSITY OF GOTHENBURG
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Reference Prices in an E-commerce Context
-An experiment with changing consumer prices

Therese Thörner

Supervisor: Tommy D. Andersson
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Therese Thörner

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Abstract

A cognitive process is activated when consumers encounter a price in a purchase situation. The price is evaluated relative to a reference price, which represents a mixture of factors such as previously encountered price levels, competing price levels and prices paid by others. In this study an economic experiment investigates how E-commerce price levels affect reference prices already established in conventional stores, and the attitudinal and behavioural effects deviations from the reference price have in E-commerce. The findings reveal that low prices encountered in E-commerce lower reference prices formed in conventional stores, and that a price increase in E-commerce causes unfairness perceptions, dissatisfaction, negative word-of-mouth communication and switching intentions, even when the new price level is lower than the initial reference in the conventional store. The theoretical implications support the applicability of established reference price theories in E-commerce, and emphasises the importance of including both online and offline price levels in future research. The managerial implications suggest that low prices in E-commerce can make prices in conventional stores change from fair to unfair instantaneously and highlights the importance of balancing prices online and offline.

Keywords: Pricing – Reference prices – Price unfairness – E-commerce - Retail

Introduction

After being persuaded by a friend I intended to purchase a luxurious makeup start-kit that had recently grown in popularity and was substantially more expensive than competitive products. After visiting a conventional store and fantasising about the final outcome, a purchase decision was made. However, being told about the substantial price difference between the conventional store and E-commerce stimulated an online price search prior to purchase. Finding the start-kit in E-commerce with a price level equivalent to half of that in the conventional store encouraged me to order it online. Although the start-kit fulfilled my expectations I no longer projected a luxurious image to it, and I would never consider purchasing it in the conventional store again. I no longer believed the extra expenditure would bring value to the product, and such an expensive price did no longer seem fair. (Author)

Prices affect consumers significantly (Tull, Boring and Gonsior, 1964; Gabor and Granger, 1966; McConnell, 1968; Shapiro, 1968; Stafford and Enis, 1969), and price fluctuations have a negative effect on consumer perceptions and purchase behaviours (Cox, 2001; Kannan and Kopalle 2001). However, price fluctuations are increasingly feasible on the Internet (Garbarino and Maxwell, 2010) and the number of consumers using E-commerce is constantly growing. Never before have so many consumers used the Internet to compare prices. There has been a tremendous increase in the use of Internet as a tool for making purchase decisions, and the distinct lines between conventional stores and E-commerce are being reduced. These changes

call for a better understanding of consumer reactions to price levels in E-commerce. (Google, 2012; 2)

This study reviews traditional reference price theories and tests them in a realistic context where prices are encountered both in conventional stores and in E-commerce. With an economic experiment it examines what consequences the emergence of E-commerce causes conventional stores by establishing how E-commerce price levels affect consumer reference prices and thereby future fairness perceptions and behavioural intentions.

Price perceptions and consumer response

Prices influence consumers cognitively and are used to make inferences about additional factors such as expected quality. (Leavitt, 1954) However, researchers differ in opinion about the strength of the price and quality relationship. Some argue that it exists (Jacoby, Olson and Haddoc, 1971; Monroe, 1976; Rao and Monroe, 1989), whereas others are doubtful and argue that it depends upon the context in which the research is executed (Gardner, 1970; Brucks, Zeithaml and Naylor, 2000). Premium products have emerged as a result of a perceived connection between price and quality (Rao and Monroe, 1996), and their existence implies that consumers occasionally make such inferences.

To evaluate a price and make inferences about quality, consumers use what Raghurir (2006: 1054) calls a “reference point” (henceforth called “reference price”). In every product category of which consumers have previous experiences, they form a reference price that represents the expected price level. This reference price is surrounded by a range of prices that are perceived acceptable in case of deviation from the reference (Gabor and Granger, 1966; Monroe 1971; Kalyanaram and Little, 1994). When a consumer encounters a new price it is weighed against the established reference. If the price significantly deviates from the scope of acceptable prices, it is perceived *unfair* (Cox, 2001; Courty and Pagliero, 2008), which is known to cause negative effects for companies (Campbell, 1999; Homburg, Hoyer and Koschate, 2005). Some consumers form reference prices on the Internet and carry them into future purchase situations, either online or offline. Hence, price levels encountered in E-commerce may affect price judgments and fairness perceptions in conventional stores. (Grewal, Iyer and Levy, 2004) The importance of investigating the implications of reference prices in E-commerce is highlighted by the consequences of deviation, causing perceived price unfairness.

Price unfairness

Deviation from an established reference price is perceived unfair and affects consumer satisfaction negatively (Monroe, 1973). Unfairness perceptions also emerge as a result of frequent changes in price levels, as it makes it difficult for consumers to interpret the fairness of a price in comparison to both previous price levels (Raghurir, 2006) and prices encountered by others (Xia, Monroe and Cox, 2004; Haws and Bearden, 2006). There are differing opinions concerning how to diminish negative effects caused by price unfairness. Some researchers argue that the level of loyalty (Kalyanaram and Little, 1994), as well as the underlying purpose of a price change (Campbell, 1999; Bolton, Warlop and Alba, 2003), affects the experienced unfairness. Xia et al. (2004: 6) suggest that price unfairness can affect several aspects of consumer behaviour, such as “purchase intentions, complaints and negative word-of-mouth communications”. In turn, consumers experiencing dissatisfaction are said to react to a wider extent than those experiencing satisfaction (Kalyanaram and Little, 1994; Kalyanaram and

Winer, 1995; Raman and Bass, 2002; Xia et al., 2004; Homburg et al., 2005; Raghurir, 2006).

Prices on the Internet

Avoiding the emergence of price unfairness in E-commerce is difficult due to the inconsistency within online price research (Brynjolfsson and Smith, 2000; Kannan and Kopalle, 2001). Some researchers argue that prices vary more in E-commerce than in conventional stores, which causes damage to the perceived trustworthiness (Kannan and Kopalle, 2001). In contradiction, others argue that prices online are changed more seldom due to the technical ability to establish satisfactory price levels (Brynjolfsson and Smith, 2000). Researchers differ in opinion regarding the effect of E-commerce on price levels and price dispersion. However, a majority agree that there is a significant difference between prices online and offline, and that prices in E-commerce are generally less expensive (Garbarino and Maxwell, 2010). In addition, price dispersion has proven quite extensive online as a result of the immaturity of the market (Pan, Ratchford and Shankar, 2004). However, as the market matures, prices within product categories are not expected to become identical, as they may be based on fundamental attributes such as brand name (Xing, 2008). The proven sensitivity for price uncertainty among consumers (Courty and Pagliero, 2008), as well as the increasing simplicity of changing supplier on the Internet (Lodorfos, Trosterud and Whitworth, 2006), highlights the importance of understanding how prices affect consumers in E-commerce.

Research Questions and Objectives

This study explores the effect of E-commerce on consumer price evaluations while taking conventional store prices into consideration. The research questions are as follows:

- *How do deviations from the reference price affect consumers in E-commerce?*
- *How are reference prices formed in conventional stores affected by E-commerce price levels?*

Garbarino and Lee (2003) argue that understanding consumer perceptions of price within an online context is of particular importance as consumer reactions to price tend to vary based on situational factors. Grewal et al., (2004) argue that E-commerce price levels affect future price evaluations, and thus imply that reference prices are carried between online and offline price encounters. In turn, the number of consumers engaging in pre-purchase price searches on the Internet is increasing (Google, 2012). Hence, more and more consumers are likely to become affected by E-commerce price levels.

Providing an understanding of the effect of E-commerce price levels on consumer reference prices increases the understanding of future price evaluations in conventional stores, and the ability to prevent perceived price unfairness by foreseeing reactions to price levels both online and offline. The overall objective of this study is to examine what consequences the emergence of E-commerce causes conventional stores. In particular, the specific objective is to establish how E-commerce price levels affect consumer reference prices and thereby future fairness perceptions and behavioural intentions. This study tests the relevance of existing reference price theories in an E-commerce context and evaluates its applicability.

Theoretical Framework

The theoretical framework starts with a review of pricing theories, followed by an explanation of reference prices and price unfairness in line with the rationale in figure 1. The final section reviews current research about prices on the Internet. Two hypotheses are presented and tested using an experimental methodology.

The development of price research

In 1954, Leavitt conducted an experimental study and isolated price as the independent variable to examine a potential effect on consumer preference. The results changed researchers' perspectives upon consumer price perceptions, as it recognised the cognitive aspects of pricing. In the 1960's, several scientists (Tull et al., 1964; Gabor and Granger, 1966; McConnell, 1968; Shapiro, 1968; Stafford and Enis, 1969) conducted research based upon the findings of Leavitt (1954) and jointly discovered that when price is the only differing factor, it signals the product's level of quality and affects consumer choice. However, the research of Stafford and Enis (1969) concluded that consumer perceptions of price might be even more complex. Their research indicated that the inclusion of additional factors resulted in a different interpretation, and provided evidence for the impact of other cognitive aspects in consumer choice. Further research suggested that the strength of the price and quality relationship was caused by isolation of the price variable (Jacoby et al., 1971; Monroe, 1976). It was suggested that price and quality were related when information was unsatisfactory, but that this relationship was not to be generalised (Gardner, 1970).

Researchers have continued discussing the relationship between price and quality. Some argue that the reason why researchers have failed to detect such a relationship is because of their use of too similar price choices (Rao and Monroe, 1989). Others argue that price is an indicator of prestige, which may be mistaken for quality (Brucks et al., 2000). The basic idea of a price and quality relationship being present in isolation remains and has resulted in the introduction of *premium products*.

Premium products use price to indicate superior quality in situations of uncertainty. They assist consumers in their purchase decisions by ensuring high quality, and using price as a signal for high production costs and a good reputation. (Shapiro, 1983) The premium price of a product includes "the excess price paid, over and above the "fair" price that is justified by the "true" value of the product" (Rao and Bergen, 1992: 412), and can be perceived an incentive for the producer to ensure superior quality (Shapiro, 1983; Rao, and Monroe, 1996). Consumers expect a certain level of quality when purchasing a premium product, whereas a failure to deliver such quality will cause negative consequences for the company (Rao and Monroe, 1996). To evaluate an acceptable price level consumers make judgments based on an internal price interval in which conclusions about the quality is drawn and prices are more or less acceptable (Gabor and Granger, 1966). This corresponds with what Monroe (1971) calls *latitude of acceptable prices*, which involves an established price range in which consumers perceive all options suitable.

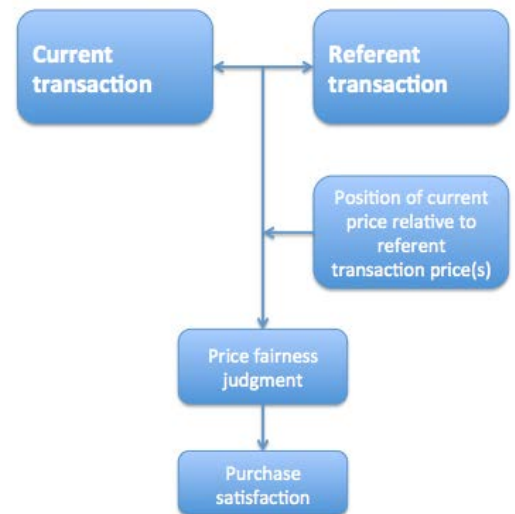


Figure 1: The cognitive process of price unfairness judgments (cf. Haws and Bearden, 2006; 305)

However, as prices move beyond the interval, consumers start to read more into the price level and its effect on product quality (Gabor and Granger, 1966).

Reference prices and consequences of price unfairness perceptions

Reference prices have evolved from a number of psychological fields but are said to originate from the *Adaptation-level theory* first identified by Helson (1948). As presented in figure 1, the reference price is used to evaluate a price level based on a comparison between a stimulus, the given price, and a previously encountered stimulus, the reference price. Reference prices are not always based on an actual price encounter (Kalyanaram and Little, 1994; Raghurir, 2006) as it has been emphasised that consumers often experience difficulties in memorising prices (Monroe and Lee, 1999). Instead, the reference price may be an estimation of experienced, advertised and expected price levels, as well as an interpretation of a fair price (Raghurir, 2006). Some researchers also argue that price levels of competing firms influence the reference price of consumers (Bolton et al., 2003), and that the interpretation of a price, such as expensive, may be used for judgment rather than the actual number (Monroe and Lee, 1999; Vanhuele and Drèze, 2002). Thus, experiencing difficulties remembering the price of a product may cause a competing brand to serve as a reference (Briesch, Krishnamurthi, Mazumdar and Raj, 1997). In addition, other consumers' expenditures (Xia et al., 2004; Haws and Bearden, 2006), as well as the perceived gain weighed against previous sacrifices impact the evaluation of a price level (Cox, 2001; Homburg et al., 2005). Reference prices are not carried internally in infinity, but are based on the most recent purchases within a category (Mazumdar, Raj and Sinha, 2005). However, some researchers argue that consumers do remember previous price levels, whereas ensuring a limited amount of price fluctuations and a balanced price level between the brand and its competitors, are what is important in terms of consumer judgment and unfairness perceptions (Briesch et al., 1997).

It is evident that opinions differ in terms of how reference prices are established and to what extent the price and quality relationship apply. However, one main consensus is that consumers use their reference prices (referent transaction) to evaluate the given price level (current transaction), and that a price above the reference would generally be perceived negative, whereas a price below the reference would be perceived positive (Kalyanaram and Little 1994; Raghurir, 2006). In addition, some claim that a negative difference between the given price and the reference affects the consumer to a wider extent than a positively evaluated price (Kalyanaram and Little, 1994; Xia et al, 2004; Homburg et al, 2005; Raghurir, 2006). In turn, behavioural reactions are said to occur more frequently as a result of a negative evaluation (Raghurir, 2006). However, some researchers argue that prices that differ from the reference, either good or bad, will always be interpreted negatively and thereby affect consumer purchase behaviour (Monroe, 1973).

Consumers are known to have a negative attitude towards price fluctuations in general, whereas a price change is often perceived unfair even if the average expected price is lowered (Courtney and Pagliero, 2008). Such negative attitudes may affect the price and quality relationship as an increase in positive evaluations, i.e. prices below the reference, may cause consumers to interpret the quality of the product to be lower (Cox, 2001). Unless handled properly (Grewal, Krishnan and Baker, 1998), such inferences may be drawn even if the positive evaluation is caused by promotions (Darke and Chung, 2005; Raghurir, 2006). In turn, promotions may affect the reference prices of consumers negatively, and thereby future price evaluations (Raman and

Bass, 2002; Mazumdar et al., 2005). This indicates that frequently encountering a cheap price is likely to lower the reference, and that it is more important to prevent negative price evaluations and price unfairness than ensuring positive price evaluations. It also indicates that positive price evaluations may cause damage in a long-term perspective as the price and quality relationship may be questioned. In turn, this implies that the price and quality relationship exists, and that a lower price level affects the interpretation of product quality negatively.

When a consumer encounters a price that exceeds the reference, a perception of *unfairness* emerges (Cox, 2001). From a managerial perspective, such attitudes may cause negative consequences for consumer behaviour, as future purchases may be affected (Campbell, 1999; Homburg et al., 2005). In turn, unfairness perceptions may cause negative word-of-mouth communication, which functions as a revenge mechanism and is harmful for company reputation (Xia et al., 2004). However, there are several factors influencing consumer judgments of differences between current and referent transactions. One particularly important mediator is the reason behind the price change (Campbell, 2007). If a price change is based on a change in demand, thereby causing increased profits and signalling a negative intention of the company (Campbell, 1999; Bolton et al., 2003), consumers usually develop a negative attitude (Courty and Pagliero, 2008). However, if a price change is due to a change in a company's cost structure, thereby not increasing the actual profit of the company, consumers find price increases more acceptable (Bolton et al., 2003; Xia et al., 2004). Such evaluations assume that consumers have complete information about the seller, which is usually not the case. Therefore, consumers are said to blame the seller for a price increase until proven differently (Xia et al., 2004), causing a negative response by default. However, such reactions can be reduced if the company has a good reputation, whereas a bad reputation makes consumers more likely to react negatively to price changes when motives are not evident (Campbell, 1999). Hence, price fluctuations can be managed properly, thereby minimising the risk of emerging price unfairness. However if failing to do so, both attitudinal and behavioural consequences are likely to emerge.

The first hypothesis is based on the previously presented research about price unfairness in general and the research of Lii and Sy (2009) in particular to evaluate its applicability on reference prices in an E-commerce context.

E-commerce price levels that exceed the reference price generate:

H_{1a} - unfairness perceptions,

H_{1b} - dissatisfaction,

H_{1c} - negative word-of-mouth communication,

H_{1d} - switching intentions

Pricing in an E-commerce context

E-commerce may affect reference prices (Mazumdar et al., 2005) and increase the sensitivity towards price changes and differences (Grewal et al., 1998). Adapting prices to consumer demand and purchase patterns, thereby causing differences in the current and referent transactions, is increasingly feasible using E-commerce (Haws and Bearden, 2006). However, the concepts of reference prices and price unfairness are not completely discovered in an E-commerce context. Hence, price fluctuations on the Internet are likely to have an effect on reference prices and thereby future price evaluations, although to an unknown extent. To

prevent the negative effects of price unfairness in E-commerce it is essential to understand the general effect of E-commerce on price levels.

Since the late 1990's, researchers have investigated how price levels are affected by E-commerce. Initially, price levels and price dispersion was of particular interest as it was expected that both would be lower online as opposed to in conventional stores (Pan et al., 2004). Pan et al. (2004: 117) define price dispersion as "the distribution of prices (such as range and standard deviation) of an item with the same measured characteristics across sellers of the item at a given point in time", meaning the difference in price of homogeneous products among several retailers. However, initial studies found results in contradiction to previous expectations (Kung, Monroe and Cox, 2002; Suri, Long and Monroe, 2003; Pan et al., 2004). Although several scientists engaged in further investigations there is a lack of consistency among the results. Some argue that prices on the Internet differ between countries (Pan et al., 2004), while others argue that the price dispersion on the Internet is rather high in general (Brynjolfsson and Smith, 2000). In turn, some researchers argue that the level of price dispersion depends upon additional factors such as market share, and that it is lower online than offline when keeping such factors constant (Brynjolfsson and Smith, 2000; Bakos, 2001). Also, some argue that price levels can be higher on the Internet than those in conventional stores (Lee, 1998; Kung et al., 2002), while others insist that prices online are substantially lower (Brynjolfsson and Smith, 2000; Bakos, 2001; Jensen, Kees, Burton and Turnipseed, 2003; Garbarino and Maxwell, 2010).

The different interpretations of how prices are affected by E-commerce does not provide a solid base for neither researchers nor managers. One potential reason for the inconsistency is the choice of product. While Lee (1998) focused on cars, thereby increasing the likelihood of finding an appropriate buyer on the Internet, Brynjolfsson and Smith (2000) focused on books and CD's that are usually more homogenous and accessible. Finding the appropriate buyer of a car online might increase the offered price level. In contradiction, an incentive might be needed to encourage consumers to purchase already accessible products through E-commerce, thereby offering lower priced books and CD's. Hence, product differences might cause researchers to find prices both higher and lower online than offline, thereby causing inconsistency when making inferences about E-commerce in general.

Although differences between prices in conventional stores and E-commerce have been discovered, most researchers focus solely on E-commerce in general, and *dynamic pricing* in particular. Garbarino and Lee (2003; 496) explain dynamic pricing as a way of adapting prices to each consumer's "willingness to pay". Dynamic pricing strategies are particularly evident online, as the Internet makes them easier to manage (Bakos, 2001; Kannan and Kopalle, 2001; Kung et al., 2002; Garbarino and Lee, 2003). Although such strategies are appealing to companies they may generate unfairness perceptions, which affects future sales and profits (Garbarino and Lee, 2003; Maxwell and Garbarino, 2010). Unfairness perceptions caused by dynamic pricing is known to generate similar reactions as those of deviations from a reference price. Within dynamic pricing, unfairness judgments are mainly based on the interpretation of a norm being violated (Garbarino and Maxwell, 2010). This is similar to consumer dissatisfaction when experiencing price increases that exceed the reference price due to what is considered negative motives (Courty and Pagliero, 2008; Lii Y-S and Sy, 2009). However, research shows evidence of contextual differences affecting negative responses. It supports the notion that price differences offered by one company, such as dynamic pricing, causes consumers to experience price

unfairness. However, it also suggests that if prices differ between a number of companies, such unfairness perceptions are not likely to occur, nor is behavioural reactions. (Garbarino and Maxwell, 2010) One potential explanation is that consumers may change their interpretation of price when entering an online environment. The vast amount of information available on the Internet makes it easier for consumers to compare price levels and thereby feel in control of their choices (Kung et al., 2002). When encountering several prices, consumers can choose the most rewarding alternative. Hence, potential dissatisfaction will not be based solely on the strategies of the company but also on the decision made by the consumer, which can cause the consumer to feel partially responsible. However, experiencing dissatisfaction when purchasing a product online has a negative effect upon consumer attitudes towards E-commerce and the likelihood of revisiting the same E-commerce channel for the next purchase (Lodorfos et al., 2006).

Online price research emphasises the negative effects of price fluctuations and perceived price unfairness. Thus, although there is a lack of reference price research in an E-commerce context, price unfairness is found on the Internet. However, the basic interpretation of price does not seem completely equal online and offline, and the target on which to blame price unfairness is wider than simply blaming the store. It seems the accessible information on the Internet causes consumers to feel more responsible for purchases online than offline, therefore increasing the likelihood of not fully blaming the E-commerce store. This implies that the dissatisfaction aimed at a conventional store would be higher than that of an E-commerce store due to the lack of information offline.

The increased availability of information on the Internet has also affected consumer purchase behaviours in conventional stores. The price level encountered in E-commerce has proven to impact future price judgments. Internet helps consumers establish a reference price and an interpretation of a fair price by comparing several online price levels. In turn, some consumers visit conventional stores for the purchase, where their fairness perception and post-purchase satisfaction is affected by the already established reference price found online. (Grewal et al., 2004) Hence, the increased use of two different purchase channels, offering identical or comparable products, may affect the reference prices of consumers. This indicates that the same relationship can be found in an opposite direction. Consumers encountering prices in conventional stores are likely to form a reference price, which may affect price evaluations in E-commerce. In contradiction, researchers (Kannan and Kopalle, 2001; Jensen et al., 2003) suggest that reference prices may be different online than offline, and that consumers may expect prices in E-commerce to be less expensive than those in conventional stores. This causes consumers to form separate reference prices for online and offline purchases, where the expectations of online price levels cause the E-commerce reference to become lower. Thus, consumers might perceive an E-commerce price level unfair if it is consistent with that of a conventional store because of expectations of a lower price (Huang, Chang and Chen, 2005).

There is an inconsistency in whether or not reference prices are transferred between conventional stores and E-commerce. Prices found online have proven to impact price evaluations in conventional stores, whereas consumers might also have two separate reference prices. However, given the difficulty in remembering price levels (Monroe and Lee, 1999), establishing two distinct reference prices for each product are likely to be quite overwhelming.

The second hypothesis is mainly based on the research of Grewal et al. (2004) assuming that reference prices are carried between price encounters online and offline, thereby affecting future price evaluations.

H₂ – Reference prices formed in conventional stores are lowered when encountering cheaper prices in E-commerce

Methods

To test both hypotheses, a 2x1 between-subjects experimental design was conducted. Experimental designs are common within price unfairness research and Grewal et al. (2004: 90) argue that they “reduce biases from memory lapses, rationalization tendencies and consistency factors”. Manipulating one or several independent variables tests dependent variables, which enables a comparison between groups. Hence, the dependent variables of the groups can be assessed against one another, and inferences about the effect of the manipulation of the independent variable can be made. (Kirk, 1982; Campbell, 1999; Collis and Hussey, 2009) In line with the purpose of this research, price serves as the independent variable being manipulated. Fairness perceptions, satisfaction, word of mouth communications and switching intentions serve as the dependent variables and will be compared between the groups.

Scenarios

The experiment consisted of three scenarios (see Appendix) of which the two initial ones were identical for both groups, and the independent variable was manipulated in the final scenario. The purpose of the first scenario was to establish a reference price in the minds of the respondents by exposing them to a purchase situation in a conventional store. The second scenario aimed to measure a general attitude among all respondents when realising that the same product can be bought on the Internet for a substantially lower price. Finally, in the third scenario the test group experienced a price increase when purchasing the product using E-commerce, whereas the control group encountered the same price as in scenario two. The purpose of the third scenario was to make inferences about the impact of the price encountered in the second scenario on the reference price of the consumer. The price presented to the test group in the third scenario was higher than that of the second scenario but lower than the initial reference price in the conventional store in scenario one. Therefore, given that the price level found through E-commerce in scenario two did *not* lower the reference price of the respondents, they would still be satisfied with the price level encountered in the third scenario. However, if the respondents perceived the price in scenario three unfair, their reference would have been affected by the price encountered in scenario two. The final scenario therefore served as a comparison of the unfairness perceptions, overall satisfaction and behavioural intentions between the groups to establish if the test group experienced more negative emotions than the control group, as well as their likeliness to engage in negative behaviours due to such reactions. To avoid bias, both scenarios and questions were presented in Swedish.

The product used in the scenarios was perfume. Perfume is used by both genders and usually differs in price between conventional stores and E-commerce. In scenario one, the respondents were introduced to the purchase of an expensive perfume in an exclusive store. Hence, the attributes of a premium product were implied but the brand was left unnamed. The price of the

perfume in scenario one was found in a conventional store in Sweden (Kicks), whereas the price encountered in scenario two was based on the price of the same perfume in a popular Swedish E-commerce store (nordicfeel.se). The price change experienced by the test group in scenario three was fictive and based on a comparison between the two previously presented price levels.

Subjects

A convenience sample (n=83) consisting of students was randomly assigned to the test group and the control group. Criticism has been aimed at experiments due to their use of students and their questionable generalizability to other consumers. (Harrison and List, 2004; Collis and Hussey, 2009) However, the main importance is to ensure a random distribution of the respondents when assigning the groups to reduce bias and strengthen internal validity (Kirk, 1982). Demographical questions ensured that there were no fundamental differences between the groups (Harrison and List, 2004). E-mails were gathered at the University of Gothenburg, School of Business, Economics and Law, and all respondents took part in a lottery with a chance of winning cinema vouchers. The questionnaires were sent electronically to all respondents, resembling the environment in which they would purchase products using E-commerce. Reips (2002) argues that respondents act more authentically when conducting an experiment on the Internet as opposed to in a laboratory setting. This is due to the reduced level of pressure, as the respondents have a choice of whether or not to participate. Studies also indicate that differences in results between Internet and laboratory experiments are quite small (Birnbbaum, 2004; Anderhub, Müller and Schmidt, 2001). By using the Internet personal encounters are limited, which reduces biases based on available information (Birnbbaum, 2004). Conducting the experiment online also ensured enough Internet familiarity among respondents. To further control for bias, questions concerning the respondents' E-commerce habits were answered.

Measurements

The measurement scales were based on the same 7 point Likert scale used in previous price unfairness research, where 1=strongly disagree and 7=strongly agree (Grewal et al., 2004; Lii and Sy, 2009). Such continuum scales are fundamental in order to properly measure emotions (Stone, 1993). Respondents were asked to rate their level of agreement with several statements about each scenario. All fairness statements resembled those of Lii and Sy (2009) as well as Grewal et al. (2004). However, slight modifications were made to match the scenarios. For instance, in scenario two the respondents were asked to rate their level of agreement with the statement "I perceive the price in the conventional store as fair". In addition, statements concerning product quality, satisfaction and word-of-mouth communications influenced by those of Lii and Sy (2009) were made to match each scenario. Also, fundamental demographical measures were found in the final part of the questionnaire. The statements in the initial scenario were mainly concerned with the impression of the product to establish the reference. The following two scenarios involved statements of price unfairness, dissatisfaction and behaviour intentions to measure reactions to price changes. All questions were identical for both groups, thereby enabling comparisons.

Internal and external validity

Dobbins, Lane and Steiner (1988) provide evidence for an extensive criticism aimed at the *external validity* of experiments, which involves the generalizability of the research (LeCompte and Goetz, 1982; Schram, 2005). Isolation of the variables in an experiment is of great importance, which causes the researcher to exclude variables that may affect the causal relationship being examined (Collis and Hussey, 2009). In this study, price was isolated as the

independent variable, thereby excluding potential mediators such as value, which is harmful for external validity. Many experiments are conducted in a laboratory, and are thus further controlled by the instructor (Birnbaum, 2004). However, this particular experiment was not conducted in a controlled environment, which strengthens the external validity. The general lack of external validity causes experiments to be perceived inaccurate and unrealistic. This criticism has evolved from researchers perceiving experiments artificial (Campbell, 1999; Schram, 2005; Collis and Hussey, 2009), which may cause valid results to be neglected (Mook, 1983; Dobbins et al., 1988). However, some researchers argue that accurately controlling for variables increases the ability to make predictions, whereas the external validity is not weakened by artificiality (Dobbins et al., 1988).

The isolation of variables and controlled environment of an experiment is valuable in terms of *internal validity* (Schram, 2005), which involves how well the results measure the causal relationships and thereby explain reality (LeCompte and Goetz, 1982; Schram, 2005). Isolation and control thus strengthens internal validity, while damaging external validity (Schram, 2005). Isolating price as an independent variable, thereby excluding factors like value, increases the internal validity of this experiment. The essence of internal validity is particularly highlighted when testing established theories, such as this study. The main argument is that generalizability, and thereby external validity, may not be the purpose of the research. Rather, testing relationships among variables may be the primary intention, whereas internal validity is more important, and the artificiality of the setting may be overlooked. (Mook, 1983; Schram 2005) The specific objective of this study is to establish how E-commerce price levels affect consumer reference prices and thereby future fairness perceptions and behavioural intentions by applying already established reference price theories in an E-commerce context. Hence, this research does not make inferences about a general reaction among all consumers, but tests reference price theories on this particular sample to evaluate its E-commerce applicability and measure a potential effect on the dependent variables. Hence, while the external validity of this experiment is rather weak, the internal validity is perceived satisfactory. Developing this study by combining several techniques can make further generalizations possible (Schram, 2005), and thus strengthen the external validity.

Statistical technique – the t-test

A t-test was conducted to compare the mean values of the control group and the test group among all dependent variables in scenario three, which is suitable to find statistically significant differences (Diehr and Lumley, 2002). The t-test is appropriate when having exposed the respondents to Likert scales and is insensitive to violations of the assumptions for parametric tests. Also, using a t-test helps control for potentially finding a result affected by type one error indicating a difference that is invalid. (de Winter and Dodou, 2010) Many variables in this study have non-normal distributions, thereby violating one of the assumptions for using a parametric test. However the t-test and its nonparametric counterpart, the Mann-Whitney Wilcoxon test, have proven interchangeable (de Winter and Dodou, 2010), and violating the assumption of normality does not affect the t-test notably (Srivastava, 1958; Diehr and Lumley, 2002; de Winter and Dodou, 2010) when the sample size is sufficiently large (Srivastava, 1958; Diehr and Lumley, 2002) and the distribution of respondents between the groups is fairly similar (Bartlett, 1935). Diehr and Lumley (2002) argue that there is no particular sample size recommended in order to validate using a t-test, however they report studies of different sizes where t-tests have proven powerful. Some of these studies involve samples of 40-50 respondents in each group.

This experiment consists of two groups with 43 and 40 respondents respectively, which indicates a satisfactory sample size as well as an equal distribution of respondents.

In contradiction to the normality assumption, the assumption of equality of variance between the groups is of great importance. The t-test provides the results of the *Levene's test for equality of variances*, which indicates violation if significant. However, the t-test accounts for such violations by providing the sig. value of *equal variances not assumed*, which was used for five variables in this experiment. Hence, the robustness of the t-test makes it relevant even when the second assumption is violated. (Diehr and Lumley, 2002)

Results

This chapter starts with a demographical description, followed by a comparison between the variables in scenario one and two. The next section reports the result of the t-tests for the variables in scenario three, which is the base of the experiment. Each hypothesis is discussed in the final part of the chapter.

Demographics

A total of 83 students were assigned randomly to the control group (40 resp.) and the test group (43 resp.), with no missing values. In total, the sample consists of 41 % males and 59 % females, with close to 80 % of the respondents being between 21-30 years old. Students younger than 21 years old represent about 15 % of the respondents, whereas the remaining 6 % is older than 30 years of age. About 99 % of the respondents have, at some occasion, bought a product using E-commerce, and 83 % have done so during the previous six months. About 74 % of the respondents usually buy perfumes within the same price range (401-600 SEK), and 88 % perceive themselves fully or partially engaged in their general perfume purchase. All demographical variables were compared between the control group and the test group with a fairly equal distribution among all but one variable. The control group consists of 55 % males and 45 % females, whereas the test group consists of 28 % males and 72 % females. Hence, while the gender variable is fairly well balanced in the control group, women are overrepresented in the test group. Potential consequences caused by this difference will be discussed later in this chapter.

Scenario one and two

In scenario one the respondents were presented with an initial price encounter serving as a reference, whereas scenario two introduced the substantially lower price available in E-commerce. Table 1 presents the changes in attitude and behavioural intention between scenario one and two among several variables, which is further supported by the change in mean values among the variables in Table 2.

Table 1: Percentage of respondents reacting negatively (1-3) and positively (5-7) to the variables in scenario one and two.

Variable	Scenario one		Scenario two	
	1-3	5-7	1-3	5-7
The quality of the product is superior to that of other products within the same category	12%	76%	28%	37%
I am satisfied with the purchase made in the conventional store	14%	75%	81%	12%
I perceive the price in the conventional store as fair	23%	64%	72%	18%
I perceive the price in the conventional store as unfair	64%	20%	18%	71%
I regret the purchase made in the conventional store	-	-	15%	76%
I will visit the conventional store for my next purchase	14%	59%	84%	6%
I will visit the internet store for my next purchase	-	-	5%	95%
I will tell friends and family about my experiences	-	-	14%	55%
I will share my experiences with others on the Internet	-	-	40%	29%

Table 2: Differences between the mean values in scenario one and two among four variables

Variable	Mean scenario one	Mean scenario two
The quality of the product is superior to that of other products within the same category	5.17	4.00
I am satisfied with the purchase made in the conventional store	5.33	2.18
I perceive the price in the conventional store as fair	4.89	2.61
I perceive the price in the conventional store as unfair	3.00	5.25
I will visit the conventional store for my next purchase	4.99	1.98

The initial variable in each scenario measured how a price difference affected the price and quality relationship. The statement claimed that the product was of superior quality in comparison to other products within the same category. In scenario one, 76 % of the respondents ticked 5-7, whereas only 12 % ticked 1-3 on the 7-point Likert scale. However, the notion of a cheaper price in E-commerce presented in scenario two lowered the rates by having about 57 % ticking 4-5. Although this means that the respondents were still quite positive about the quality, more than 30 % ticked 4 in scenario two, and thus were neutral in opinion. This is further supported by viewing the mean values changing from 5.71 in scenario one to 4.00 in scenario two (see Table 2). This indicates that the notion of a price decrease affected the quality evaluation negatively.

The notion of a lower price on the Internet also affected the satisfaction of the respondents. In scenario one, about 75 % reacted positively (5-7) while 14 % responded negatively (1-3). However, in scenario 2, only 12 % responded positively (5-7) while 81 % of the respondents reacted negatively (1-3). This indicates that the satisfaction of the respondents changed from positive to negative after learning about the price difference between the conventional store and E-commerce, which is also evident in the mean values of scenario one (5.33) and two (2.18) in

Table 2. In fact, 76 % of the respondents in scenario two agreed (5-7) with regretting the purchase made in the conventional store.

In scenario one, about 64 % of the respondents agreed (5-7) with the statement of the price in the conventional store being fair, while 23 % disagreed (1-3). In turn, 20 % of the respondents agreed (5-7) with the statement of the price in the conventional store being *unfair* in scenario one, while 64 % disagreed (1-3). In contradiction, after being exposed to the notion of a lower price available in E-commerce in scenario two, 18 % agreed (5-7) with the price in the conventional store being fair, while 72 % of the respondents disagreed (1-3). Additionally in scenario two, 71 % agreed (5-7) with the statement of the price in the conventional store being *unfair*, while only 18 % disagreed (1-3). Table 2 clearly demonstrates the change in mean values for perceiving the price fair by moving from 4.89 in scenario one to 2.61 in scenario two, and the mean values for perceiving the price unfair by moving from 3.00 in scenario one to 5.25 in scenario two. Hence, the fairness perception of the price in the conventional store changed from positive to negative after learning about the lower price available in E-commerce.

The final variables in scenario one and two measured the behavioural intention of the respondents. In scenario one, 59 % of the respondents reacted positively (5-7) to the statement of intending to revisit the conventional store for the next purchase, while 14 % responded negatively (1-3). However, in scenario two, only 6 % responded positively (5-7) to the same statement, while about 84 % of the respondents responded negatively (1-3). This change in attitude is further emphasised by comparing the variables' mean values for scenario one and two, which is 4.99 and 1.98 respectively (see Table 2). Additionally in scenario two, slightly more than 95 % of the respondents reacted positively (5-7) when asked to evaluate their intention to visit the E-commerce store for the next purchase, thereby indicating an intention to change supplier.

In scenario two, about 55 % of the respondents agreed (6-7) with the statement of having the intention of telling friends and family about their experiences. In contradiction, only about 29 % of the respondents were likely to engage in word-of-mouth communication on the Internet. In fact, about 40 % responded negatively (1-3) to that statement.

Scenario three; the experiment

In scenario three the control group was presented with the same price as in scenario two, whereas the test group encountered a price level higher than that in scenario two, but lower than that in scenario one. Table 3 presents a summary of the results from the t-tests.

Table 3: Results from the t-test where a value below .05 indicates a statistically significant difference between the mean values.

Variable	Mean, Control group	Mean, Test group	Levene's Test for Equality of Variances	T-test for equality of means, sig. (2-tailed)	
I perceive the price as fair	6.10	3.07	0.001	Equal variances assumed: 0.000	Equal variances not assumed: 0.000
I perceive the price as unfair	1.80	5.05	0.001	Equal variances assumed: 0.000	Equal variances not assumed: 0.000
The quality of the product is superior to that of other products within the same category	4.03	3.98	0.612	Equal variances assumed: 0.890	Equal variances not assumed: 0.891
I am satisfied with my purchase	6.28	3.21	0.000	Equal variances assumed: 0.000	Equal variances not assumed: 0.000
I regret the purchase	1.70	4.28	0.000	Equal variances assumed: 0.000	Equal variances not assumed: 0.000
I will visit the conventional store for my next purchase	2.08	3.81	0.702	Equal variances assumed: 0.000	Equal variances not assumed: 0.000
I will visit the internet store for my next purchase	6.35	4.14	0.001	Equal variances assumed: 0.000	Equal variances not assumed: 0.000
I will visit alternative internet stores for my next purchase	5.00	6.14	0.063	Equal variances assumed: 0.002	Equal variances not assumed: 0.003
I will tell friends and family about my experiences	4.53	5.33	0.182	Equal variances assumed: 0.047	Equal variances not assumed: 0.047
I will share my experiences with others on the Internet	3.23	4.09	0.564	Equal variances assumed: 0.057	Equal variances not assumed: 0.057

As presented in Table 3, there are only two variables that exceed the significance value of 0.05, meaning that there is no statistically significant difference concerning the statement of product quality and word-of-mouth communication on the Internet. However, all remaining variables have a sig. number below 0.05, meaning that there is a statistically significant difference.

The first two variables in Table 3 concern the fairness and unfairness of the price respectively. Both variables are significant with a value of 0.000. The respondents in the control group responded positively to the fairness of the price encountered in scenario three, whereas the response of the test group was significantly more negative. In correspondence, the respondents in the control group did not agree with the statement of the price being unfair, whereas the respondents in the test group agreed to a wider extent with that statement.

A similar pattern is represented in the variables concerning being satisfied or regretting the purchase, with significant results for both variables and sig. values of 0.000 respectively. The mean values of the two groups show a noteworthy difference in satisfaction as the control group experienced substantially more satisfaction, and the regret experienced by the test group is of a greater magnitude than that of the control group. However, while the control group does not agree with regretting the purchase, the mean value of the test group (4.28) indicates that they are quite neutral in opinion.

There are three variables measuring future purchase behaviour. The first variable involves the likelihood of revisiting the conventional store in scenario one. The t-test shows a statistically

significant difference between the groups with a sig. value of 0.000. The mean values of both groups are rather negative as none agree with intending to visit the store for future purchases. However, the test group has a higher mean value than the control group, approaching the neutral option (4).

The second behavioural variable concerns the intention to revisit the E-commerce channel in scenario two and three. The difference between the mean values on this variable is statistically significant with a value of 0.000. While the test group is rather neutral, the control group agrees with having the intention to revisit the E-commerce channel again for the next purchase.

The third behavioural variable concerns the likelihood of visiting alternative E-commerce channels for the next purchase. The t-test shows a statistically significant difference between the control group and the test group with a sig. value of 0.002. Hence, although the difference in mean values between the groups is rather small, 5.00 and 6.14 respectively, and both groups agree upon intending to visit alternative E-commerce channels, the test group is more likely to do so.

The difference in mean values on intending to engage in word-of-mouth communication with friends and family is statistically significant with a sig. value of 0.047. However, the mean values are quite similar. While the control group is quite neutral (4.53), thereby neither agreeing nor disagreeing with the statement, the test group has a slightly higher mean value (5.33). This indicates that the test group is more likely to engage in word-of-mouth communication post purchase.

Differences caused by gender in scenario three

Because of the unequal distribution of the gender variable between the control group and the test group an additional t-test was conducted. The intention to revisit the conventional store was the only variable with a statistically significant difference between the mean values of men and women. With a sig. value of 0.726 on the Levene's test for equality of variance, the sig. value of "equal variances assumed" in the t-test was evaluated with a value of 0.029. The higher mean value of women indicates that they are more likely to revisit the conventional store. Noteworthy however, is that the difference in mean values is quite negligible as the values of men (2.5) and women (3.31) are both negative. This indicates that neither group agree with the statement of having the intention to revisit the conventional store. However, in the previous discussion the statistically significant difference between the mean values of the control group and test group concerning their likelihood of revisiting the conventional store is quite similar with 2.08 and 3.81 respectively. Therefore, as women have proven more likely to revisit the conventional store, and the test group has a higher ratio of women as opposed to the control group, this could have affected the slightly higher mean value of the test group on this variable. However, as both groups report a negative response, the difference has a negligible effect on the conclusions of this research.

Hypotheses testing

With the results from the t-test in Table 3, the hypotheses can be evaluated. The first hypothesis of this research was as follows:

E-commerce price levels that exceed the reference price generate:

H_{1a} - unfairness perceptions,

H_{1b} - dissatisfaction,

H_{1c} - negative word-of-mouth communication,

H_{1d} - switching intentions

The manipulation of the independent price variable had an effect on the reactions of the test group. There is a statistically significant difference between the groups on H_{1a} , where the test group responded more negatively to the price change. The test group agreed with the price being unfair and disagreed with it being fair, whereas the control group perceived the price as rather fair, which supports H_{1a} .

The test group also differed significantly from the control group on H_{1b} , where the test group experienced a higher degree of dissatisfaction. Also, while the control group were quite determined in their lack of regretting the purchase in scenario three, the test group was unsure, neither agreeing nor disagreeing with the statement. Hence, H_{1b} is supported by the experiment.

H_{1c} is not as easily interpreted. Both groups agreed upon having the intention of telling friends and family about their experiences, with the test group having a slightly higher mean value. However, there was no statistically significant difference concerning their intentions to engage in word-of-mouth communication on the Internet. Hence, H_{1c} is partially supported, and the test group is slightly more likely to engage in word-of-mouth communication, which is fair to assume will be of a negative nature based on their previous dissatisfaction.

There were three variables measuring H_{1d} , all showing statistically significant differences between the groups. The first variable concerns the likelihood of revisiting the conventional store. None of the groups agreed with the statement, but the mean value of the test group was higher than that of the control group. This indicates that the perceived unfairness in the E-commerce purchase made them slightly more likely to consider returning to the conventional store. The second variable measured the likelihood of revisiting the Internet store in which the purchase was made in scenario three. While the control group had a high mean value, thereby agreeing with having the intention to revisit the same Internet store, the test group was rather neutral. The final variable concerned visiting alternative Internet stores for the next purchase. While both groups agreed to some extent, the mean value of the test group was very high. By examining the mean values on all three variables for both groups it is obvious that future purchase routines will differ. While the highest mean value of the control group concerned revisiting the Internet store for the next purchase, the test group was more likely to search for alternative Internet stores, thereby neither revisiting the conventional store in scenario one, nor the Internet store in scenario two and three. Hence, H_{1d} is also supported by the experiment.

The second hypothesis of this study was as follows:

H_2 – Reference prices formed in conventional stores are lowered when encountering cheaper prices in E-commerce

The test group experienced a price increase in scenario three, thereby being exposed to a new price to be evaluated relative to their reference. If they carried the reference price from the

conventional store into E-commerce, they would experience satisfaction and the price in scenario three would be perceived fair as it is lower than their reference. However, if the initial reference found in the conventional store was lowered by the encountered E-commerce price in scenario two, the price in scenario three would be perceived higher than the reference, therefore causing dissatisfaction and unfairness perceptions.

The independent price variable in scenario three had a statistically significant effect upon the test group. The test group experienced a higher degree of dissatisfaction and regret, while perceiving the price unfair. In contradiction, the control group had a high degree of satisfaction, while perceiving their price fair. These results indicate that the initial reference price encountered in the conventional store in scenario one was lowered by the E-commerce price paid by a friend in scenario two. Hence, the experiment supports H_2 by indicating that reference prices formed in conventional stores are lowered when encountering cheaper prices in E-commerce, which affects future price unfairness evaluations.

Discussion

The overall objective of this study was to examine what consequences the emergence of E-commerce causes conventional stores by establishing how E-commerce price levels affect consumer reference prices and thereby future fairness perceptions and behavioural intentions. The study consisted of the following two research questions: *How do deviations from the reference price affect consumers in E-commerce; and, How are reference prices formed in conventional stores affected by E-commerce price levels?* The experiment indicated that the reactions found to deviations from the reference price in conventional stores are also found in E-commerce. Hence, deviations from the reference price in E-commerce cause unfairness perceptions, dissatisfaction, negative word-of-mouth communications and switching intentions. It also revealed that low price levels in E-commerce lower reference prices formed in conventional stores, which affects future price evaluations both online and offline. Grewal et al. (2004) argues that reference prices can be transferred between conventional stores and E-commerce, and thereby affected by both price encounters. This experiment supports these arguments by suggesting that reference prices formed in conventional stores are likely to be affected by prices encountered in E-commerce, which affects future price evaluations.

The reason for the price increase in E-commerce was not explained to the test group in scenario three, which caused a negative response by default in correspondence with Xia et al. (2004). Offering an explanation for a price change may help reduce price unfairness perceptions, although failing to do so will cause negative reactions (Bolton et al., 2003). Although the respondents experienced dissatisfaction, their level of regret was rather neutral, which might be perceived unexpected. However, Kung et al. (2002) suggest that consumers might feel partially responsible for the emerging dissatisfaction, as the Internet provides them with information and consumers choose their suppliers. The respondents in the test group were not offered a choice of whether or not to purchase the product using E-commerce, but were faced with a predetermined purchase. Hence, their lack of regret may be based on their interpretation of the purchase, where the consumer faced with the choice in scenario three is partially responsible for the emerging dissatisfaction. As this is based on the large amount of information available on the Internet, such a reaction may not have emerged in a conventional store where information is

limited. Instead, it is likely that the negative reaction to a price increase would be blamed solely on the conventional store. The experiment offers a slight indication of such a reaction, as the notion of a cheaper price in E-commerce in scenario two affected the satisfaction negatively, and the intention to revisit the conventional store was remarkably low as opposed to visiting the Internet store for the next purchase. Hence, the perceived fairness of the price level in the conventional store was radically changed.

Perfume was used in the experiment because of its large price difference online and offline as well as its usefulness for both genders. It was implied that the perfume had premium product characteristics and was bought in an exclusive store. The initial reference price in the conventional store was 775 SEK, which exceeds the price range in which 74% of the respondents would usually purchase their perfumes (401-600 SEK). However, in scenario two, the price in E-commerce (515 SEK) was found within that price span. In scenario three, the control group encountered the same price as in scenario two, whereas the test group experienced a price increase (649 SEK). Hence, the control group was offered a price that matched their usual expenditure and was lower than the initial reference, thereby experiencing satisfaction. The test group encountered a price that exceeded both their usual expenditure and the price paid by a friend, and therefore experienced dissatisfaction although the initial reference in the conventional store was higher. Hence, even though the test group was informed about the luxuriousness of the store and the popularity of the perfume, the price increase was perceived unfair due to the lowering of the reference price. This may also be supported by their change in quality perceptions. Their interpretation of the perfume's quality declined due to the price fluctuations, which might have caused the respondents to question the price and quality relationship of the perfume and thereby the fairness of the price. However, it would be of interest to further investigate whether dissatisfaction and unfairness perceptions would occur even if the price in scenario three would match the higher limit of the usual price span (600). Although the price would still be higher than the price paid by a friend in scenario two, and thereby higher than the new reference, it would be placed in the price range that is usually perceived acceptable. However, it is noteworthy that the respondents experienced satisfaction when purchasing the perfume for a price (775 SEK) substantially higher than their usual expenditure (401-600 SEK) in scenario one, and that this price was perceived fair. Hence, the effect of the price increase in scenario three exceeding the usual expenditure is not likely to affect the unfairness perceptions and dissatisfaction to the same extent as the lowered reference price.

Another important aspect of using perfume in the experiment is what differentiates a purchase in a conventional store from that in E-commerce. When visiting a conventional store, the consumer may try the perfume while being assisted by the personnel. However, when purchasing the same product through E-commerce, such value creating activities are not available. This may affect the overall evaluation of the price, as different levels of value surrounding the product may affect the perceived fairness. Also, further expenditures associated with delivery and payment may emerge in E-commerce, making consumers more suspicious when purchasing a product on the Internet, as opposed to in a conventional store. Hence, the overall value and expenditure of the purchase might differ. However, consumers might try the perfume in the conventional store, while making the actual purchase on the Internet. In case the stores are not part of the same company, this would raise the profits of the Internet store while reducing the resources of the conventional store. Although this experiment clearly explained

that the respondents had experiences of both the perfume and the conventional store, their attitudes were changed rapidly when experiencing a lower price in E-commerce, and they did not intend to revisit the conventional store. In turn, a price increase in E-commerce affected their likelihood of revisiting the Internet store negatively, while encouraging them to visit alternative Internet stores. However, scenario three revealed that the likelihood of the test group to revisit the Internet store was slightly higher than that of the conventional store. This indicates that the dissatisfaction aimed at the conventional store had a greater impact on the respondents than did the dissatisfaction aimed at the Internet store. Although the respondents had previous experiences of testing the perfume in the conventional store and receiving personal service from employees, they were more likely to order it through E-commerce despite previous dissatisfaction. This indicates that the value creating activities in the conventional store do not completely match the price differences found in E-commerce. However, the result might have been different if the experiment concerned a first time purchase with more uncertainty involved, unless the conventional store was used to test the product before purchasing it in E-commerce.

The price differences found throughout the experiment caused a change in perceived quality. In scenario one, the respondents were informed about the high price level of the perfume and perceived the quality to be good. However, when realising that the same perfume was available in E-commerce for a substantially lower price, the perceived level of quality decreased instantaneously. Although the respondents changed their interpretation of product quality, a third of the respondents were neutral in opinion in scenario two. This indicates that the high price level in scenario one was signalling high quality, thus indicating a price and quality relationship. However, insecurity emerged as the price variable changed. In scenario two and three respondents were faced with price fluctuations, making it more difficult to interpret the quality. Therefore, respondents became neutral in opinion. This corresponds with researchers arguing that price fluctuations (Cox, 2001) and promotions (Raghubir, 2006) may cause consumers to question the price and quality relationship.

Researchers differ in opinion regarding whether consumers carry reference prices between conventional stores and E-commerce. While some argue that consumers have separate reference prices online and offline due to their different expectations (Kannan and Kopalle, 2001; Jensen et al., 2003), others argue that a single reference price is carried online and offline by indicating that reference prices formed in E-commerce affects price evaluations in conventional stores (Grewal et al., 2004). In this experiment, the sudden dissatisfaction aimed at the conventional store when learning about the low price level found in E-commerce in scenario two indicates that reference prices formed in conventional stores are used to evaluate E-commerce price levels. If the respondents were expecting a lower price online, and this price was not evaluated relative to the reference in the conventional store, then the level of dissatisfaction would not have been so heavily affected. Hence, the dissatisfaction aimed at the conventional store in scenario two indicates that the reference price formed in the conventional store is carried into E-commerce, which supports the findings of Grewal et al. (2004).

The nature of this experiment forced an isolation of price as an independent variable to properly measure the effect on the dependent variables. All scenarios were simplified and presented in a short summary to ensure that the respondents properly understood the context, which may have affected the results. For instance, although consumers usually experience difficulties

remembering previous prices (Monroe and Lee, 1999), this experiment provided price levels throughout all three scenarios. This might cause the respondents to establish a better understanding of the actual difference between the prices online and offline, as well as the actual price increase online. However, in real life the difference might not have been quite as evident. Noteworthy though, is that the extensive price search online prior to purchase indicates that consumers are becoming more aware of price levels.

The first scenario of the experiment stated that the respondents usually purchased the perfume at the conventional store, and thereby implied loyalty. Kalyanaram and Little (1994) argue that loyalty reduces the level of perceived price unfairness and thereby the implications of deviations from the reference price. To properly measure such mediation loyalty needs to be isolated as the independent variable. Although price was subject for isolation in this experiment, some loyalty inferences can be made based upon the findings. In scenario two, the respondents experienced substantial dissatisfaction aimed at the conventional store and had low revisit intentions. Also, in scenario three, neither the control group nor the test group was likely to revisit the conventional store. This indicates that loyalty did not affect the unfairness perceptions in this study and that the controlling nature of this experiment did not support loyalty as a mediating factor.

The two latter examples clearly exemplify the importance and risks of controlling for one independent variable. By isolating price as the single independent variable it became feasible to make inferences about its effect on the respondents, which supported the internal validity. In contradiction, the isolation caused other factors to be excluded, thereby making it impossible to make inferences about potential mediators, which weakened the external validity. However, strengthening the internal validity in this study enabled a proper analysis of the price manipulation, thereby opening up for additional experiments measuring the effect of potential mediators.

Theoretical implications

Previous research offers a clear understanding of reference prices as a phenomenon. However, the increased use of E-commerce complicates pricing and most reference price theories solely concern prices in conventional stores. Also, the existing research of the general effect of E-commerce on price levels is rather contradictory (Brynjolfsson and Smith, 2000; Kannan and Kopalle, 2001), which makes it risky to make inferences based on these studies. This experiment extended previous research by applying established reference price theories in an E-commerce context to evaluate its applicability and increase the understanding of how E-commerce price levels affect consumer reference prices and thereby future fairness perceptions and behavioural intentions. The results show similar attitudinal and behavioural reactions to deviations from the reference price in E-commerce as found in conventional stores. Thus, the experiment supports that traditional reference price theories are highly relevant also in E-commerce.

The experiment also indicates that reference prices formed in conventional stores are lowered when encountering cheaper prices in E-commerce. This supports the notion that reference prices are complex and not solely based on the initial price encounter, but on latter encounters as well (Mazumdar et al., 2005), either online or offline. Such findings may have an impact on future research as most of the existing studies are focusing on either conventional stores or E-commerce in isolation. The results of this study indicate that online and offline price encounters

both affect the reference price of consumers and thereby future price evaluations. Hence, merely focusing on either conventional stores or E-commerce may cause bias to the results by excluding mediating factors. This article calls for further research concerning reference prices and E-commerce, whereas particular areas are recommended in the final section of this chapter.

Managerial implications

The overall objective of this study was to examine what consequences the emergence of E-commerce causes conventional stores. Having found results supporting that reference prices formed in conventional stores are lowered by cheaper prices encountered in E-commerce may have an impact on how companies ought to think about pricing. In practice, these results indicate that consumers who are pleased with an initial price level in a conventional store may switch to another supplier in an instance. Hence, a lower price level online may lower the reference price of consumers, meaning that the price in the conventional store is suddenly perceived expensive and unfair. Also, research indicates that consumers are becoming more and more likely to conduct a price search online before entering a conventional store to purchase a product (Grewal et al., 2004), and that prices online tend to be lower than those in conventional stores (Garbarino and Maxwell, 2010). This indicates that consumers may lower their reference prices in the future, making prices in conventional stores perceived unfair. In this experiment, as well as in previous research (Xia et al., 2004), such unfairness perceptions have proven likely to cause switching intentions, thereby causing damage to consumer loyalty. Therefore, managers may gain from being aware of the emerging pre-purchase price search on the Internet, in order to ensure that the prices offered in conventional stores do not deviate substantially from price levels found online. Alternatively, that the value offered in-store compensates for the price difference, thereby decreasing the risk of potentially emerging unfairness perceptions. However, if a price change is inevitable because of increased costs, explaining the reason behind the price increase may help lower potential unfairness perceptions (Bolton et al., 2003; Xia et al., 2004).

Another important finding is that managers need to consider consumer reactions before engaging in price experiments online. Previous research has shown that price fluctuations, such as dynamic pricing, cause negative reactions among consumers (Garbarino and Maxwell, 2010). The results in scenario three supports the notion that such price fluctuations cause dissatisfaction and unfairness perceptions, which in turn causes negative behaviours. Hence, although E-commerce enables companies to change prices more frequently, they should do so with caution. Not only may price fluctuations affect consumer reactions negatively, the experiment also supports previous researchers (Cox, 2001) stating that such price changes may be harmful for perceived quality. Even a positively evaluated price level may cause negative effects as it may lower consumer perceptions of quality and cause them to expect an equally low price level in the future. Hence, even promotions need to be properly managed to prevent a lowering of consumer reference prices and implying declining quality. Therefore, managers should consider the importance of not only preventing negative price evaluations and emerging price unfairness, but of limiting the frequency of positive price evaluations to ensure high perceived quality and avoid lowering reference prices.

Limitations and future research

The respondents in this experiment consist of students. Although students are usually used as subjects when conducting experiments (Harrison and List, 2004; Collis and Hussey, 2009), this may affect the results. Students are generally known to be price sensitive due to their tuition and

lack of income. As this research is based solely on price perceptions, the results may be affected. A target group with a high income may not react as much to price increases because of the negligible effect it has on their overall economy. Hence, future research is needed to investigate if price sensitivity increases the differences between the test group and the control group in this and other experiments.

Although it was tested and no evidence was found indicating that the gender variable affected the results, further research is recommended. This is emphasised by the fact that the research of Beldona and Namasivayam (2006) indicate that women are slightly more affected by unfairness perceptions than men. Maxwell, Lee, Anselstetter, Comer, and Maxwell (2009) also discovered a difference between unfairness perceptions of men and women, although both gender display negative reactions. However, such differences may be affected by geographical location, and thereby tradition, rather than gender. Further research is needed in order to establish whether potential gender differences affect the results of this and other experiments.

Conclusions

The overall objective of this study was to examine what consequences the emergence of E-commerce causes conventional stores by establishing how E-commerce price levels affect consumer reference prices and thereby future fairness perceptions and behavioural intentions. Established reference price theories were tested in an E-commerce context and their applicability was evaluated. Price was manipulated as the independent variable in an economic experiment involving three scenarios in order to test two main hypotheses. The first hypothesis assumed that deviations from the reference price in E-commerce cause unfairness perceptions, dissatisfaction, negative word of mouth communication and switching intentions. It was supported by analysing t-tests measuring the difference in mean values between the test group and the control group among several dependent variables. The second hypothesis assumed that reference prices formed in conventional stores would be lowered when encountering cheaper prices in E-commerce, which was also supported by the t-tests.

The first two scenarios in the experiment revealed that a lower price level found in E-commerce causes the respondents to perceive the previously encountered price in the conventional store unfair. Although the price was perceived rather fair in scenario one, the notion of a lower price being accessible immediately generated unfairness perceptions, dissatisfaction and regret aimed at the conventional store in scenario two. This affected future purchase intentions as the respondents became more likely to visit the Internet store than the conventional store for the next purchase. Also, once a price difference was revealed, the perceived quality of the product instantly declined.

Manipulating the price variable and presenting a price increase in E-commerce to the test group in the final scenario caused negative reactions. There were statistically significant differences between the mean values of the groups in all but two variables. The test group perceived the price increase in E-commerce in scenario three unfair, were regretful, intended to search for alternative Internet stores for the next purchase and were more likely to tell friends and family about their experiences. Although the price increase resulted in a price lower than the initial reference in the conventional store, the respondents reacted negatively, while the control group

was rather positive. These results indicate a change in the reference price of the test group. Instead of perceiving the price in scenario three a gain relative to the initial reference in the conventional store in scenario one, the price was perceived a loss relative to the much lower E-commerce price presented in scenario two. Hence, the initial reference price formed in the conventional store was lowered due to the exposure of a cheaper price in E-commerce, which affected the upcoming price evaluation.

Supporting the hypotheses provided answers to both research questions. The first research question concerned the reactions to deviations from the reference price in E-commerce. This study reveals that deviations from the reference price in E-commerce causes unfairness perceptions, dissatisfaction, negative word-of-mouth communication and switching intentions, which corresponds with previous theories of reference prices in conventional stores. The second research question concerned how E-commerce price levels affect reference prices formed in conventional stores. The results show that if an E-commerce price level is lower than the reference price formed in a conventional store, then the reference price is likely to be affected and thereby lowered. The experiment further indicates that such a change affects the fairness judgment of future price encounters.

This study extends previous research by taking into consideration that consumers encounter prices both in E-commerce and conventional stores. The results reveal that E-commerce price levels affect consumer reference prices and thereby future fairness evaluations of price levels encountered in conventional stores. It also indicates that traditional reference price theories are relevant not only in conventional stores, but also in E-commerce. In addition, the importance of not neglecting either online or offline price encounters is emphasised in order to properly understand consumer price unfairness judgments. The findings highlight the managerial importance of controlling price differences and fluctuations to avoid negative reactions among consumers, as well as the theoretical importance of engaging in more E-commerce price research to further understand its effect on consumer reference prices.

The results of this experiment offer an explanation to the change in attitude and behaviour after receiving the make-up start kit. Although the price in the conventional store was initially perceived fair, a cheaper price in E-commerce lowered my reference price. It made me question the price and quality relationship, and the price level in the conventional store suddenly seemed unfair due to the substantial deviation from my new reference. The experiment indicates that similar reactions occur among other consumers, meaning that the extensive price search on the Internet as well as the low price levels online might cause consumers to perceive prices in conventional stores unfair. (Author)

Appendix

Scenario 1, both groups

Imagine that you are entering an exclusive perfume shop. You are about to buy a perfume (50ml) from a well-known brand that you have bought in the same store several times before. The perfume costs 775 SEK, which is substantially above the average for perfumes.

Föreställ dig att du kliver in i en exklusiv parfymbutik. Du skall köpa en parfym (50ml) från ett välkänt varumärke som du handlat i samma butik flera gånger tidigare. Du köper parfymen för 775 kr, vilket är betydligt högre än det genomsnittliga priset för parfym.

Scenario 2, both groups

Imagine that you tell a friend about buying the perfume in store for 775 SEK. Your friend tells you that the same perfume is sold on the Internet for 515 SEK, and that he/she recently ordered it.

Föreställ dig att du berättar för en vän att du köpt parfymen i butik för 775 kr. Din vän tipsar dig då om att samma parfym (50ml) säljs på internet för 515 kr, varav han/hon nyligen beställt produkten.

Scenario 3, control group

Imagine that your perfume is used up and that it is time to buy a new one. Instead of visiting the regular store where the perfume costs 775 SEK, you visit the Internet store where your friend found it for 515 SEK. The perfume is in fact sold for that price and you decide to buy it on the Internet instead of in the regular store.

Föreställ dig att din parfym tagit slut och att det är dags att köpa den på nytt. Istället för att gå till den vanliga butiken där parfymen kostar 775 kr besöker du den internetbutik där din vän funnit den för 515 kr. Mycket riktigt, parfymen säljs till det priset, varav du väljer att köpa den via internet istället för i den vanliga butiken.

Scenario 3, test group

Imagine that your perfume is used up and that it is time to buy a new one. Instead of visiting the regular store where the perfume costs 775 SEK, you visit the Internet store where your friend found it for 515 SEK. When you are about to order the perfume you realise that the price has been raised to 649 SEK. Because the latter price is still cheaper than that in the regular store, you choose to purchase the perfume on the Internet anyway.

Föreställ dig att din parfym tagit slut och att det är dags att köpa den på nytt. Istället för att gå till den vanliga butiken där parfymen kostar 775 kr besöker du den internetbutik där din vän funnit den för 515 kr. När du skall beställa parfymen inser du att priset höjts till 649 kr. Eftersom det senare priset fortfarande är billigare än det i butik väljer du ändå att köpa parfymen via internet.

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