

THEY FRAMED ME!

Promotional Framing in a Digital Environment

A quantitative study on customer preference for different promotional frames and the moderating effect of time constraint.

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Abstract

Following the COVID-19 pandemic there has been an undeniable boom in the e-commerce industry, now accounting for nearly one fifth of all retail sales worldwide, which has accelerated the shift from physical retail to online retail by up to five years. This has forced previously physical retailers to enter the extremely competitive e-commerce environment, where consumer attention is dwindling and ever more difficult to grab, price comparison only the touch of a button away, and the overall pace is much faster. This has caused a mounting dependence on price-promotions and effective value communication, yet no research has evaluated the perception of different promotional framings in a digital environment, and therefore no framework exists for the growing number of e-commerce retailers. This thesis aims to: 1) quantitatively investigate customer preference and valuation of the most prevalent price-promotion framings on the Swedish e-commerce market moderated for exposure time, as e-retailers have mere seconds to communicate value to potential customers, and 2) confirm or refute the relevance of existing price-promotion literature for e-retailers. Previous literature indicates that customers prefer price-promotion framings in absolute terms at high price levels (\$100+), percentage terms at low price levels (less than \$100) and generally undervalue the discount depth in a given promotion. This study relies on a quantitative experimental design utilizing a between-subjects design to evaluate the effect of exposure time and a within-subjects design to evaluate the effects of price level. The study consisted of two parts, first part exploring respondent preference for either absolute, percentage or sale price / reference price framings at both high and low-price levels with different degrees of exposure time limitations, and the second part exploring respondents' tendency to over or under value the discount depth of price-promotions framed in absolute or percentage terms. The findings from the first part are in direct opposition of previous literature, where respondents under time constraints preferred percentage framings at high price levels and absolute framings at low price levels. The second part supports previous literature, where respondents generally undervalued the discount depth of a given promotion. The degree to which respondents' evaluation time was limited had no significant effects in either part of the study.

Keywords: E-commerce, Price Promotion, Framing, Discount Depth

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1. Introduction

1.1 Background

This thesis aims to investigate how consumers perceive promotions, using three common promotional price framings, to understand which has the highest perceived value when put in contrast to each other, as well as the consumers' tendency to over/under estimate the magnitude of the discount offered in a digital environment. Furthermore, we explore the moderating variable of time, as currently, most promotions are viewed digitally with a finite number of seconds available for the promotion to convey value. Constraining the time the consumers have to evaluate the offer shown allows for measuring its impact on promotional price framing preference and accuracy in estimating the magnitude of the discount. The methodological approach used to investigate this was a quantitative experimental design, using both between subject (with respect to time) and within subject (with respect to price level), and using three types of promotional offerings.

In the wake of the COVID-19 pandemic, e-commerce expanded rapidly as consumers were constrained indoors and encouraged to fulfill their shopping needs online, which forced retailers to re-evaluate their online channel structure and offering (Goldberg 2022). As of 2021 e-commerce accounted for 16% of total retail sales in Sweden (Share of the e-commerce market out of the total retail market in Sweden from 2006 to 2021), and 19% of retail sales worldwide (Cramer-Flood 2022), a significant increase from 9.8% in Sweden and 12.2% worldwide prior to the pandemic. This change in the retail landscape brought forth by the COVID-19 pandemic has permanently altered consumer behavior, where more consumers are expected to continue shopping online, which will result in an expected 60% decline in department stores and has accelerated the shift from physical to online retail by up to five years (Perez 2020). This shift has been most noticeable within the (US) grocery sector, which saw about 2-3 percent e-commerce penetration prior to COVID-19, a high of 20-30% during the height of the pandemic, and had settled down to 9-12 percent by the end of 2020 (Aull et al. 2021), a three-fold increase from pre-pandemic levels. A similar trend was observed in Sweden, with nearly 40 percent of Swedish grocery consumers shopping online during the pandemic, and seven out of ten indicating that they will continue doing so post-pandemic (Lund 2021).

Furthermore, according to a forecast by eMarketer, e-commerce is expected to continue growing at a steady pace for the foreseeable future (Cramer-Flood 2022).

The pandemic has also brought about the growth in social media commerce, which is expected to account for more than 5% of e-commerce sales by 2025, up from 3.4% in 2020 (Fryer 2021). The overall indication is that the retail sector will become increasingly dependent on e-commerce and social commerce sales in the foreseeable future, not only in the previously strong retail sectors (beauty, apparel, electronics) but across all retail sectors. With the mounting dependence on e-commerce within the retail industry in conjunction with decreased brand loyalty post-pandemic (Goetzen 2021), and the growing strategic importance and prevalence of price promotions (Prachi n.d), it is now, more than ever, vital for e-retailers to effectively communicate price-promotions in order to acquire and retain customers in the fiercely competitive e-commerce landscape.

Promotional-price framing:

Previous research on price-promotion framing (the manner in which a discount is communicated) is plentiful. Price-promotions are widely used within retail in order to “[dramatically] increase sales” for promoted brands or products (Inman, McAlister 1993). The general consensus is that price-promotions increase sales because consumers evaluate the promoted item more favorably and thereby influence customers’ choice-behavior (also known as the price-sensitivity explanation) (Inman, McAlister 1993). Retailers can display price-promotions using absolute terms (monetary savings), percentage off, just the promoted price, or any combination of the different methods (Della Bitta et al. 1981). The two most prevalent methods, absolute terms and percentage off have been extensively investigated and compared in quantitative studies, with mixed results.

Della Bitta et al. (1981) investigated eight different combinations of price-promotion framings, using combinations of: regular price, sale price, absolute discount, percentage discount, and found that “presenting regular price and percent off produced a nearly significantly lower perception of value for the money than did presenting regular price and dollar amount off” (Della Bitta et al. 1981). A study by DelVecchio et al. (2007), which compared absolute savings to percentage savings at different discount depths, found no evidence of a difference in purchase intention between absolute savings and percentage off.

Another study by Chen et al. (1998) explored the value-perception of absolute savings versus percentage off and found that there was no significant difference in consumers intention to buy between the two different promotional-price framings, however, “mean values suggested that dollar amount-based discounts benefitted high-priced items, whereas a percentage discount appeared preferable for low-priced items” (González et al. 2016).

Building on the indication that absolute savings were preferable for high priced items and that percentage off framings were preferable for low-priced items (Chen et al. 1998), González et al. (2015) investigated consumers' perception of value and purchase intention after being exposed to an absolute vs. a percentage off price-framing at different price levels. González et al. (2015) found conclusive support for absolute savings being more favorable at higher price levels (\$100+), and while not significant, found an indication that percentage off is preferred at lower price levels.

In summation, despite the vast amounts of research on promotional-price framing, very little conclusive evidence has been found to indicate that one type of framing is superior to another in a specific setting. Based on the work by Chen et al. (1998) and González et al. (2015) we can determine that absolute savings are preferred for high-priced items, and we can assume (no statistically significant support) that percentage off is better for low-priced items. This overall lack of clarity and ambiguous results within the subject becomes apparent when evaluating the current nature of promotions that are employed by e-retailers in Sweden, which use promotional framings not according to past research on brick and mortar retailers, but presumably pick framings that best reflect the price image of their brand. This is an assumption and beyond the scope of this thesis, as the focus is which of the three framings presented has the highest perceived value for consumers in a digital landscape, but regardless a noteworthy observation that could be researched further. Through desktop research evaluating some of the largest e-retailers operating in the Swedish market, we found that there is no apparent standard for how to frame promotional prices. The tactics employed vary not only across different industries but also between retailers within the same industry (table 1). In certain cases, the tactics employed can vary on a retailer basis, with some promotional prices being displayed in e.g., percentage off and others using only the sales price and reference price (e.g., dustin.se) with no apparent underlying reason.

Time constraint:

To the best of our knowledge there is no research evaluating consumer preference for certain types of promotional-price framing under the constraint of time, and the relevance of the current promotional-price framing research for e-retailers can be questioned due to the fast-paced nature of e-commerce/social commerce shopping. Consumers will rapidly scroll through product lists, glance at display ads on newspaper sites, or quickly scroll by ads in their social media feeds.

Furthermore, a survey conducted by Microsoft in 2015 concluded that the average human attention span has dropped from 12 seconds in 2000 to 8 seconds in 2015, one second less than the attention span of a goldfish (Microsoft Attention Spans Research Report, Spring 2015). The window for an e-retailer to communicate value to a (potential) customer is incredibly small, and the existing research on promotional-price framing has not taken that into account.

Table 1: Promotional-price framing strategies of 10 large e-retailers in Sweden.

Retailer	Type of promotional framing
Dustin	Percentage Off or Sales Price + Reference Price
Boozt	Percentage Off
Apotea	Sales Price + Reference Price
Adlibris	Percentage Off
Nelly.com	Percentage Off
Mathem	Sales Price + Reference Price
Elgiganten	Absolute Savings
MediaMarkt	Sales Price + Reference Price
Komplett	Percentage Off + Absolute Savings
Linasmattkasse	Percentage Off + Absolute Savings

The Heuristic-Systematic dual-processing model indicates that when there is a lack of ability to process information systematically, such as being under a time-constraint, people will revert to heuristic processing (Suri, Monroe 2003). Heuristic processing requires less cognitive processing and relies on non-content clues, or heuristics (memorized knowledge structures) in order to make decisions and process incoming information, however, it is also less reliable for information processing (Chaiken 1980). As the existing research on promotional-price framing has not limited subjects in the amount of time they had to respond, coupled with the fact that the respondents have been enrolled in higher education (Chen et al 1998; González et al. 2015; Della Bitta 1981), they have likely relied on systematic processing of the offers; while a customer evaluating an advertised offer for a limited time is likely to rely on heuristic processing (Suri, Monroe 2003).

Suri & Monroe (2003) found that respondents processed information less carefully while under high levels of time pressure, which would indicate a less thorough evaluation of promotional prices in a time-limited environment such as e-commerce.

As for consumers' tendency to over/under value discounts presented there is to our knowledge no prior research that has explored the degree of over/under valuation when respondents are put under time constraints. Existing literature that explores over/under valuation without the aspect of time constraints is under the consensus that consumers will generally undervalue presented promotions, especially percent-off promotions due to the higher degree of processing required (see (DeVecchio et al. 2007); (Gupta, Cooper 1992); (Blair, Landon 1981)). Kim and Kramer (2006) found that they were able to induce systematic processing by their respondents by presenting discounts in a novel way (e.g “pay 60%” instead of “save 40%”). They found that by inducing systematic processing, consumers evaluated the level of discount more accurately than they did when promotional prices were presented in a more traditional manner (Kim, Kramer 2006). Relying on the work of Kim and Kramer (2006), Suri and Monroe (2003) and the Systematic-Heuristic dual-processing model, we can infer that by limiting the respondents' ability to systematically process a promotional-price, they will revert to heuristic processing and therefore be less accurate in their evaluation of discount depth.

1.2 Purpose

While previous research has explored the various ways of framing a price-promotion across several studies and with different methodologies, the overall results and conclusions are mixed. Further, there have been studies exploring the effect of time constraints on consumer price evaluations, however, not in the context of evaluating different types of price-promotion framings. The existing research on price-promotion framing fails to take into account the very important aspect of time, as the window of opportunity that e-retails have to communicate value to (potential) customers is very limited. Considering the limited ability to systematically process information due to a time constraint, customers will be forced into heuristic processing of information, which will result in a high likelihood of customers not evaluating price-promotions the same when under a time constraint vs. no time constraint (Chaiken 1980). As such, the first purpose of this thesis is to determine consumers' perception of value for three prominent price-promotion strategies at different price levels and to either validate or invalidate existing research's relevance for e-retailers.

To further understand how consumers perceive and evaluate price-promotion framings when their ability to systematically process information is limited, we want to explore their tendency to over/under value price-promotions under time constraints. Existing literature indicates that customers generally undervalue promotions (see (DeVetchio et al. 2007); (Gupta, Cooper 1992); (Blair, Landon 1981)) but are more accurate in their evaluations when systematically processing the presented offers (Kim, Kramer 2006). To our knowledge no previous research has evaluated customers' accuracy in evaluation of discount depth when under time-pressure, and as such the second purpose of this thesis is to establish: 1) whether customers' evaluation of discount depth is affected by time constraints and 2) whether customers' under or over value discount depth when under time constraints.

1.3 Contribution

This thesis will contribute to the existing price-promotion framing literature by investigating the effects of time constraints on consumer perceptions of value for three prominent price-promotion framings at different price levels, and either validating or invalidating the relevance of existing research for e-retailers. Furthermore, it will provide an understanding of how time constraints affect consumers' tendency to over or under value price-promotions, an area which has not been previously researched. This study will contribute to e-retailers by providing a helpful guide for how to best frame price-promotions and give an understanding of how consumers actually perceive the value of different price-promotion framings in a fast-moving e-commerce environment. It is vital to mention that this study does not take into account the price image of a brand and only accounts for promotional framing value perception under time constraint.

1.4 Disposition

In the introduction (1) the subject's background is layed out, the thesis relevance is motivated, and its contribution to existing research explained. The theoretical framework (2) logically lays out how previous literature and studies helped develop the studies hypotheses. Next, the method (3) logically lays out both the pre-study and main study, describing how and why they were done. Following the method, the results (4) section highlights the results of the study along with pertinent analysis. Discussion (5) comes next, where the major findings are highlighted and explained, as well as managerial impacts are explained. Next, limitations and recommendations for future research (6) are brought up. The thesis rounds off with a bibliography (7) that lists all used sources, and an appendix (8) where the study can be seen in its entirety.

2. Theoretical Framework and Hypotheses

2.1 Types of Promotional Framings

Traditional brick-and-mortar retailers have long used price promotions to boost sales, as it has been established that they affect customers' purchase decisions (Inman, McAlister 1993). In the past, physical retailers have used a combination of promotional strategies based on the value of an item and the involvement in a purchase, but market research on major e-commerce actors revealed the existence of three dominating ways of framing promotions, a price reduction in absolute terms (SEK off), in percentage terms (% off), or sale price / reference price. A promotion described in absolute terms can facilitate a customer and provide high levels of accuracy in calculating the revised price whereas percentage-off discounts are considered complex due to the mathematics needed, leading to undervaluation of said promotions (Choi, S. Mattila 2014). The third type of framing, sales price/reference price, uses alternative "wording" that could reflect the same amount of savings but is perceived differently by consumers (Varadarajan 1984), though depending on the size of the promotion, effects are moderated (McKechnie et al. 2012) with each type of promotion framing being best suited for specific price ranges. Nevertheless, while promotional framing affects how a deal is valued by customers, it is established that price assessment is mostly done using an internal reference price (IRP), becoming the main comparator between promotions (Compeau, Grewal 1998). The IRP is the customers' interpretation of a price in a category, and it sets the low, mid and high price range internally, using it to compare and contrast promotions to decide the value of the monetary sacrifice required during purchase, but while the effects are well documented, no concrete evidence exist on how the internal reference price is stored in memory (Compeau, Grewal 1998). Their research proceeds to demonstrate how "advertised reference price (ARP) levels enhance consumer IRP estimates, value perceptions and purchase intentions and lowers their search intentions", as well as illustrate how consumers are more likely to react to reduced sales prices rather than increases to ARPs.

Past research on price sensitivity identified two types of consumers, the first weighing a purchase based on a price to quality ratio and the second which focuses on the price, without employing a price/quality schema (Moore, Carpenter 2008) Furthermore, online retailers face a similar dilemma to their offline counterparts: shelf space, which digitally translates to the

arrangement of products on a web page. Therefore, creating good value perceptions of the items presented is important, and heavily dependent on the digital infrastructure and framing of the offering. However, it is worth noting that customers are affected by a multitude of external factors, such as the presence of popularity queues, motivating them to make a purchase based on trust that an item is popular (and on sale) because other consumers prefer it (Xu, Cai et al. 2013).

2.2 How Framing Affects Perception

Consumers perceive discounts differently depending on the framing, which can be absolute or relative and is influenced by the nature of the purchase (McKechnie et al. 2012). Preferences are divided into two subcategories, decision and experience preference, but framing affects only the former directly (Frisch 1993). Both types are interconnected as a decision leads to an effect in experience because opting into a promotion will set expectations based on the feedback after evaluating the outcome, with framing effects being characterized as “perceptual illusions” (Tversky, Kahneman 1974). The consensus on framing is that a subject should perceive a situation differently depending on the framing of the outcome, but if they have the same reaction to two different framings, external factors have affected the subject’s decision, leading to a failed framing. Frisch’s research concluded that subjects, regardless of whether they evaluate different framings of the same situation as similar or dissimilar, they make that decision based on internal motivations, sometimes admitting that their decisions were biased (acknowledging the equivalence of the two framings), but subjects that took part in the experiments conducted genuinely believe framing affects how a situation is perceived.

The same theory applies when referring to promotional framings. A discount of the same monetary amount on two items of different product categories is viewed as X SEK saved in both items when viewed in an absolute way. But when the promotion is viewed relatively, saving two hundred SEK on a four thousand SEK TV is perceived differently compared to saving the same amount on a one thousand SEK frying pan due to the difference in price levels. In addition, most consumers will evaluate a promotion relatively as opposed to basing their purchase on absolute terms and will use external factors to make a purchasing decision, reacting differently depending on the promotional framing. (Chen et al. 1998). The third type of promotional framing chosen is derived from Della Bitta et al’s (1981). research which places

the regular price / sale price promotion framing as the middle ground in consumers' perception when selecting an offering and is supported by market research of e-retailers at the time of writing.

2.3 Effects of Time Pressure

To understand how consumers process the information provided by a promotion, a time constraint was added to reveal the most favorable promotion framing. To isolate the promotion framing, we removed brand and feature information and altered the framing to reveal preferences between two price ranges. As customers use price to infer quality and intrinsic value of an item, a time constraint will expose how promotional framings relate to perceived value, with customers acting heuristically during the information processing phase (Chaiken 1980). Heuristics are used to simplify complex tasks and distill the information available, producing actionable alternatives, but can lead to systematic errors because of the omissions involved (Tversky, Kahneman 1974). The limited validity of the data used to make a decision also influences whether the specific data available provide no or worthless evidence. In the case of the former, subjects that took part in Tversky and Kahneman's (1974) study used prior probabilities, as for the latter prior probabilities were ignored. The illusion of validity in heuristic decision making can lead to results using limited predictive accuracy as a decision is made based on fitting the outcome to a (perceived) correct input. Availability is a significant term that falls under heuristics, which states that the frequency of a class appearing is linked to the ease of bringing said class to mind, creating biases based on the context. A great example from Tversky & Kahneman (1974) is: "...assess the risk of heart attack among middle-aged people by recalling such occurrences among one's acquaintances." A person subjected to this question will find higher frequency and probability of a heart attack as most heart attacks occur during that time frame in life. The same applies to using heuristics to evaluate promotions, as a customer will recall the class at hand, and based on existing biases will evaluate whether the promotion (and its framing) is of value to them (or not). While this might seem irrelevant to our thesis, we need to consider this when looking at the results, as consumers will have a developed opinion on the category shown to them based on experience preferences and in combination with the aforementioned literature on price level of promotion framing, we decided to add a time constraint to our hypothesis.

Adding time pressure restricts a customer's ability to process information, inhibits their ability to tend to the task at hand and increases their motivation and effort to perform (Suri, Monroe 2003). Operating under those findings and having removed external stimuli (brand and features) unrelated to price, consumers will have high motivation and most likely return to heuristic evaluation, providing results that are connected to a reflex reaction rather than a lengthy process of evaluating alternatives. Thus, when under time constraint customers will rely on their own and the assumption is that they will prefer percentages as it is closer to their established heuristic frameworks concerning what is a good discount. Hence, we have created our first and second hypotheses:

H1a: Consumers will perceive higher value when promotions are framed as monetary savings at higher price levels.

H1b: Consumers will perceive higher value when promotions are framed as percentage savings at lower price levels.

H2: Consumers under stricter time constraints will prefer discounts framed in percentage off, as they can rely on existing knowledge structures (heuristics) to gauge its relative strength.

2.4 Evaluation Accuracy

As mentioned, the less time a consumer has to evaluate a promotion the more the accuracy of perceived value will be decreased (Dhar, Nowlis 1999). Consumers faced with time pressure tend to accelerate information filtering and focus more on the attributes they perceive to be important (Ben Zur, Breznitz 1981), often altering their decision strategy, turning to heuristics. The higher the conflict is for a purchase, the higher the possibility of choice deferral, i.e., customers opting out of a purchase instead of selecting the best option at hand. A high conflict scenario would be evaluating between two equally attractive choices whereas a low conflict scenario is defined as evaluating between alternatives where one is clearly superior to the other (Dhar, Nowlis 1999). For the purposes of this thesis, we chose a high conflict scenario between identical products with no brand or feature information and used the same savings, framed in three ways without an explicitly stated deferral option, aiming to reveal preference towards one of the promotional framings. Instead of removing time constraints entirely, we tested the effect of increasing the time available to review the promotions to double, expecting the value

perception of consumers to be more accurate. With more time available we expect consumers to turn to systematic thinking while evaluating information, requiring a greater amount of cognitive effort. Using content cues to evaluate a message (in this case a promotional offering) will help avoid type I and II errors as more time and effort is used to scrutinize a message, when reliability concerns outweigh economic concerns and especially when consumers feel that the judgment has important consequences to themselves (Chaiken 1980). The message content is the main focus of the systematic view, with non-content cues being used as an aid in a secondary manner, provided that high involvement is part of the decision-making process, which is affected by the argumentation provided in order to reach a conclusion. Thus, increasing the available time a consumer has to make a decision, decreases deferral chances and enables them to internalize and process more information about the promotion, becoming increasingly accurate in their value perception assumption, which leads to our last hypothesis:

H3a: Consumers will, regardless of exposure time, under-value the depth of a discount.

H3b: The longer a consumer has to evaluate an offer the more accurate they will be closer to the actual discount depth.

3. Method

3.1 Choice of Subject

In the past decade e-commerce has grown considerably (Chevalier 2022), and especially during the COVID-19 pandemic with industries such as clothing boasting YoY growth of over 30% during certain months (E-handeln slår rekordstarka tillväxttal 2021). This growth, although slowed, has been sustained in the aftermath of the pandemic, which can be largely attributed to changed behaviors and needs, technological innovations and more. This has forced a lot of retailers to move their business online, into the fiercely competitive e-commerce market. In e-commerce, price comparisons are only a few keystrokes away, with hundreds of retailers competing simultaneously for consumer attention through channels such as search engine marketing, display ads, social media ads and much more. This means that e-retailers have come to frequently use price-promotions to acquire and retain consumers, and to mitigate margin

losses and maximize perceived value, e-retailers have to optimize the effectiveness of price-promotion framings (Prachi n.d). The over-use of discounts, and particularly fake discounts (inflating the original price in order to communicate deeper discounts), in online-retail has caught the attention of regulators. As of June 1st 2022, a new law forcing e-retailers to display the lowest price they have sold a particular product for in the past 30 days will come into effect in Sweden, which will make effective value communication of price-promotions even more vital (Ett Moderniserat Konsumentsskydd, Proposition 2021/22:174). Although promotional-price framing and time constraints effect on perceived price and value have been studied independently, the effect of time constraint on promotional-price framing preference and perceived discount depth has, to our knowledge, never been explored.

3.2 Study Object

3.2.1 Channel

As the focus of this study is perception of price-promotions in an e-commerce setting it was natural to conduct the survey online in order to as closely as possible replicate the environment in which the respondents would likely encounter the types of promotions investigated. The survey was optimized for mobile use, as almost 73% of total e-commerce sales are through mobile devices and we wanted respondents to encounter the survey in the same environment as they are (likely) shopping online (Mobile Commerce Sales in 2022). The survey was distributed through personal social channels and community groups in order to reach subjects throughout the day, also attempting to replicate how customers would encounter online price promotions. The survey was conducted in English to mitigate language barriers as our own social channel spans people in Sweden, Greece, Dubai, United States, Canada and more.

3.2.2 Products and Product Information

As this study explores price-promotion perception at two different price levels, building on the work of González et al. (2015), we required two different products at a higher (\$100+) and a lower price level (\$0-\$100). The selected products were a television for the higher price level and a frying pan for the lower price levels, as we wanted products that could satisfy a need of the general population and therefore be considered a relevant offer (if it were received from an

e-retailer). Furthermore, as we did not want variables such as brand equity or respondents' personal attitude towards the brands to affect their responses, televisions and frying pans are good products as they have generic designs with no clear identifiers. All logos or other brand identifiers were removed from the product images. The only product information included was a generic product name: “TV 55” 4K” for the television, and “Frying Pan” for the frying pan, and a price. In hindsight the frying pan should have received a name more similar to that of the television, with a size attribute, however, as the authors considered the name to be irrelevant, as all other identifiers were removed, and the respondent focus would be on the price, limited consideration was given to the naming. Both the television and frying pan were priced according to what we considered a market average by browsing several retailers that offered these types of products for sale.

3.2.3 Presentation of Offers

The survey included two “separate” parts: the first part exploring the respondents’ preference of different promotional-price framings when presented next to each other (percentage savings vs. absolute savings vs. sale price / reference price), and the second part asking respondents to evaluate the discount depth when presented with a promotion framed in percentage savings or absolute savings. Throughout all questions the respondents were placed under a time constraint, being allowed to see each offer for either five or ten seconds depending on which subject group they were in. Both subject groups are under time constraint as the purpose is to determine how consumers evaluate price-framings in a fast-paced digital market, where flash marketing and short exposure times are common practice. The ten second time limit was chosen as it was two seconds over the average human attention span (Microsoft Attention Spans Research Report, Spring 2015), allowing them more time to view the offers than they would likely pay attention to any offer that they would be exposed to throughout their everyday lives. The five second time limit was chosen as it is both below the average human attention span, allowing them less time to process the information presented, as well as coinciding with the average mandatory exposure time of many online advertisements (e.g., YouTube advertisements, mobile pop-up ads, etc...)(Delshad 2014).

Percentage framings displayed the final after-discount price in red, and the percent the product was discounted by. The absolute savings framing showed the final after-discount price in red, and the monetary savings from the original price. The sale price / reference price showed the

final after-discount price in red, and the original price crossed over in black, with no communication of the difference. Attached to each of the three offers was the letter A, B or C for the three choice alternatives. The left-to-right order in which the offers appeared was varied across every presentation to avoid effects of subconscious preference for offers placed on either the left, right or middle. The offers can be seen in the appendix 8.1.

In the first part of the study the three price-promotion framings being explored (percentage, absolute and sales price / reference price) were presented adjacent to each other, featuring the same product. The after-discount price level was slightly altered ($\pm 10\%$), however, the relative discount provided on each product was kept the same. The after-discount price level was slightly altered to hinder the consumer from easily realizing that all three price-promotion framings offered the exact same discount. In the second part of the study each promotional framing was presented individually, either showing a percentage discount or an absolute discount.

3.3 Research Method

A between subject, with respect to time constraint, and within subject, with respect to price level, qualitative research approach was employed to test the hypotheses. Given the research subject at hand and the authors time constraint, a quantitative approach was deemed favorable over qualitative approach. The ability to broadly distribute a survey through the authors vast international social networks also guaranteed a broader and more varied set of respondents than what could have been reached through qualitative research, which allows the findings of this thesis to be applied to a broader set of customers. Furthermore, as our survey includes an element of time-limitation, that was determined to be easiest to control through survey timing tools.

3.4 Pre-study

The main purpose of the pre-study was to 1) ensure that respondents would understand the task at hand and 2) not easily identify that the discount depth on each one of the three different price-promotion framings were in fact the same. To achieve this, without hampering the

number of respondents that could potentially answer the main study, a qualitative approach with a smaller respondent pool was employed over a quantitative approach.

The fact that price-promotion framing can affect consumer preference at different price levels (see González et. al 2016; Chen et. al 1998) and that time constraints affect customers' value perception (see Suri, Monroe 2003) has been established by previous research, it was determined that investigating the causal relationship between time constraints and value perception of different promotional-price framings was superfluous.

Therefore, the pre-study consisted of having 10 people, both experienced and inexperienced with academic research, complete a preview of the survey and then sharing their thoughts. The survey they were shown was quite similar to what will be outlined in 3.5.1 and 3.5.2, and therefore only the changes made as a result of the pre-study will be explained here.

In the pre-study, the after-discount price in the first part of the survey was the same across the three promotional framings, and the first realization of the pre-study was that some of the respondents were able to quickly determine that two or more of the promotional framings were the exact same discount. Therefore, the after-discount price level was slightly altered, while keeping the discount depth (relative discount) the same, between the promotional framings for the main study. Following the change in after-discount price level across the different promotional framings, the pre-study subjects expressed difficulty in understanding how to determine which offer was the best. Therefore, two examples were devised to highlight that it is not 1) the lowest after-discount price, nor 2) the largest monetary savings that indicates the best offer, but rather the largest relative discount (% saved) that is the best.

3.5 Main Study

3.5.1 Design of Main Study

The study opens with "*Welcome to this SSE bachelor thesis research study!*" in order to inform the respondents that their answering of the survey helps contribute to a final bachelor thesis. They were then presented with a message that reads:

“The study should take you around 3 minutes to complete. Your participation in this survey is voluntary and you have the right to withdraw at any point during the survey, for any reason, and without any prejudice. Your answers will be completely anonymous, which also means that you can not withdraw your participation once you have completed the survey. Your responses will solely be used for research purposes and not shared with any 3rd party.”

The purpose of the above text is to ascertain the respondents’ voluntary participation in the survey, and that they understand for which purposes their responses are collected. The time estimation was added in order to attempt to maximize response rates, as three minutes is a short time commitment. The first pages ended with *“By proceeding to the next part you agree to voluntarily take part in the study”*.

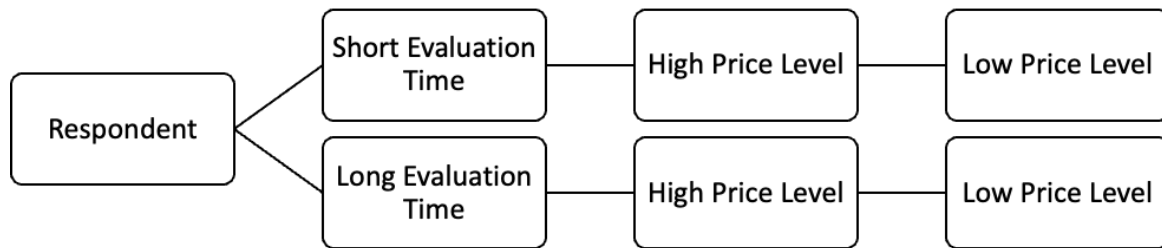
Following the introduction/consent box respondents were asked several standard demographic questions:

- Age: Under 18, 18-24, etc...
- Gender: Male/Female/Non-binary/Other
- Employment status: Student, Full-time employed, etc...
- Household size
- Online shopping frequency: Never, a couple of times per month, once a week, a couple of times per week.

These questions' purpose was to ensure equal respondent demographics across the between-subject study groups in order to rule out differences due to factors other than the treatments applied.

The study relied on both a between-subject and within-subject design, in a 2 (short evaluation time vs. longer evaluation time) X 2 (high price level vs. low price level). The respondents either had a short time or long time to evaluate each offer (between-subject) and were exposed to both offers at a high price level and a low price level (within subject):

Table 1: Study Design Chart



3.5.2 Survey Design

Due to limitations in employing both random allocation and timing tools in the survey creation tool used (Qualtrics), two separate surveys where the between-subject treatment of time was manually varied had to be created. Auto-advance timing did not allow for random allocation of time limits, and when attempting to randomly allocate respondents to either one of two blocks with the determined long or short evaluation time, the following warning message was displayed: *“Enabling Question Randomization may invalidate your timing question results”*. As time constraint is one of the key variables explored, the sacrifice of some randomness in the respondent allocation was determined to be a less harmful tradeoff than invalid timing results. The design of the two surveys was identical, the only difference being the duration for which the respondents were exposed to the offers.

The survey started off with the participation/consent block and then proceeded to the respondent demographic block, both outlined in 3.5.1. Following those two blocks, the first part of the “main” survey, exploring consumers' preference for different promotional price framings began.

Consumers were first presented with a text explaining the task at hand:

“In the following 4 questions you will be shown three different promotional offers from a fictive e-commerce retailer for a very brief moment. We want you to evaluate which offer was

the best (best % savings from original price, not cheapest after the discount or largest monetary/SEK saving)''.

A further explanation was also included as a result of the pre-study, presenting two examples of fictive offers, and which one is the best.

“A car discounted from SEK 500,000 to SEK 400,000 (-20%) is a BETTER offer than a car discounted from SEK 350,000 to SEK 315,000 (-10%).

A car discounted from SEK 500,000 to SEK 400,000 (-20%) is a WORSE offer than a car discounted from SEK 100,000 to SEK 70,000 (-30%).”

The introduction to the first part of the main survey ended with a text stressing that the offers would only be visible for a short amount of time, and that it was vital to pay close attention. Following the introduction, consumers were exposed to four sets of alternating high priced and low priced offers. For clarification purposes, one set of offers includes the same product (television for high priced or frying pan for low priced) discounted by the same relative discount but displayed in three different framings: percentage off, absolute savings or sale price / reference price as outlined in 3.2.3.

High Priced > Low Priced > High Priced > Low Priced

Depending on which survey the respondent received, they either saw the offers for five or ten seconds before being automatically advanced to the next page. The next page had a question asking the consumer to pick which offer was the best (A, B or C). This answer was collected through a free-text box for the purpose of allowing respondents who may realize that all the offers are of equal magnitude to answer accordingly. This was determined to be the best alternative, as adding a multiple choice offer for “all offers are equal” could have tipped the respondents off to that being the case.

Once respondents had seen and answered all four questions, the second part of the survey, evaluating their tendency to over/under value offers began. First consumers were exposed to two price-promotions framed in percentage terms in succession and asked to evaluate the savings in absolute terms, and following that they were exposed to two price-promotions framed in absolute terms and asked to evaluate the percentage discount. Prior to each part (two percentage discounts and two absolute discounts), an explanation of the task was offered:

In the next two questions you will be shown two offers with a percentage (absolute) discount, we want you to estimate the approximate savings in SEK (percent) for those two discounts. The price shown in red is the price after the discount. This is not a math test, so please do not use a calculator in your answers. The offers will be shown for a limited amount of time.

Following each displayed offer, a question asking the consumer “*How much did you save in SEK (percent)?*” was displayed alongside a free-text box. The free-text box was chosen to not limit the consumer in their answers. The five or ten second time constraint that consumers were placed under in the first part of the survey applied to the second part as well.

The survey ended with a control question to certify that the respondents had paid attention to the subject matter of the study and thanking the respondents for their participation. The survey in its entirety can be seen in appendix 8.1.

3.5.3 Sample Group

This survey relied on convenience sampling, acquiring respondents by sharing the surveys across various social channels, including Facebook, Instagram, LinkedIn and Snapchat. Direct messages were employed to reach contacts that are not frequently active on social media channels. The two versions of the surveys (long and short response time) were shared by both authors, alternating which version was shared across different networks (e.g., if author one shared the short response on Facebook, author two would share the long response). Each post about the survey stressed the fact that people should not answer the survey more than once. The surveys were first shared on April 7th 2022 and active for 2 weeks (until April 21st 2022). During that time the surveys amassed a total of 157 responses (87 for short response time and 70 for long response time), however, a lot of responses were rendered invalid due to incomplete responses. After removing all incomplete responses, those who failed the control question and anyone under the age of 18, a total of 69 valid responses were left (32 for short response time and 37 for long response time). Despite the invalidation of nearly 56% of our responses, we still had $n > 30$ responses in each subject group, and could therefore complete statistical tests (Söderlund 2018). Due to the large incomplete response rate, the demographics of the valid and invalid responses were compared to ensure that not only specific demographics had completed the study, which revealed no significant differences in the respondent demographics.

Furthermore, the demographics questions revealed no statistically significant differences between the long and short response time subject groups. Most respondents were 18-24 years of age, followed by 45-54, gender was split nearly 50/50 between men and women, leaning slightly towards women, 84% of the sample were either students or employed full-time, 90.3% of the sample shopped online either a couple of times per month or a couple of times per year, and the average household size was about 2.8. An independent-samples proportions test was used to compare Age, Gender, Employment status and online shopping frequency between the two subject groups. An independent-samples t-test was employed to test mean difference in household size.

3.6 Reliability & Validity

3.6.1 Reliability

Reliability refers to “the stability of the measuring instrument used and its consistency over time” (Surucu, Maslakci 2020). As the study involved no multi-variable indexes measuring the same dependent variable, but rather relied on respondents choosing between one of three options (A, B or C) for the first part of the survey, and relied on consumers entering the perceived discount either in SEK or percent for the second part of the survey, it can reasonably be inferred that that measurement instrument would be consistent over time in measuring the dependent variables (best of three offers or perceived discount). The respondents were also given clear instructions that were determined to be comprehensive through our pre-study, and should therefore have accurately understood the tasks at hand.

3.6.2 Validity

Validity refers to “whether the measuring instrument measures the behavior or quality it is intended to measure” (Surucu, Maslakci 2020). As this study explores two rather simple measures, which price-promotion framing consumers *perceive* to be the best (offering largest relative savings to original price), and the magnitude of savings, we can be rather certain that the measuring instrument is valid. To further ensure validity in part one of the main survey, the answer was not forced through multiple-choice (offer A, B or C) but was rather a text box

where we requested the respondent to type A, B or C. This was to allow respondents who may realize that all offers were of equal magnitude to answer accordingly and not be forced into selecting an answer. Furthermore, a pre-study was conducted to ensure that the instructions were clear and that respondents would accurately interpret the task. The products used in every set of offers were the same, and were stripped of all brand names as well as other brand identifiers. This ensured that the only factor that respondents could rely on to determine which offer they perceived to be the best was the promotional framing.

Internal validity, which is “the extent to which a study establishes a trustworthy cause-and-effect relationship between a treatment and an outcome,” can be presumed to be strong in our study (Cuncic 2021). Social interaction was not possible due to the survey being taken individually online, which also removed issues of experimenter bias and the standardized nature of the survey ensured equal “behavior” with both subject groups (Cuncic 2021). The threat of maturation was not present as the time it took to complete the survey was only a couple of minutes (Cuncic 2021). One possible threat to the internal validity of our study is attrition, as a portion of our respondents did not complete the entire survey (Cuncic 2021).

External validity, which is “how well the outcome of a study can be expected to apply to other settings”, should also be strong for our study (Cuncic 2021). The sample, although acquired through convenience sampling, presumably includes respondents from across the globe, with a nearly 50/50 split between men and women, ages ranging from 18-64, varying household sizes, employment statuses and experience levels with online shopping. Further, there were no statistically significant differences in the demographics of the two subject groups. Situational factors should not have impacted our results, as respondents were reached through different channels and at different times of the day, similarly to how respondents would encounter promotional offers from e-retailers (Cuncic 2021). One threat to our external validity is the Hawthorne-effect: “participants change their behavior because they know they are being studied” (Streefkerk 2021), which is near impossible to avoid. However, due to our study primarily relying on consumers cognitive processing and not behavior, the possible negative effects of the Hawthorne-effect should be mitigated, with the primary behavioral change that consumers could have undertaken is dedicating more or less effort to evaluating the offers than they would have if they came across them outside the scope of a study. An added limitation is how the items are displayed, as the TV has rudimentary specifications, whereas the pan is

lacking these and is classified as a “pan”, which as mentioned was done so the consumer would focus on the price rather than revert to heuristic behavior on choice of material, size or brand.

4 Results

4.1 Consumer Preference for Promotional Framings Overall

To test hypotheses H1a (that consumers will perceive greater value at high price levels when price-promotions are framed as monetary discounts) and H1b (that consumers will perceive greater value at low price levels when price-promotions are framed as percentage discounts) a series of one-sample proportion tests were conducted to test for significant differences in proportions of respondent preference for different price-promotion framings. The test value that the proportions were compared against was 0.33, as the assumption is that if respondents value perceptions are not influenced by promotional framing, all three options would be chosen equally. An overview of the results is presented in Table 2. Eight out of the twelve tests resulted in a statistically significant differences, where all four percentage framings deviated significantly from the assumed 33% proportion, three out of four of the absolute framings deviated significantly from the assumed proportion and only one out of sale price / reference price framings differed significantly from the assumed proportion.

Table 2: Results from One-Sample Proportion Tests for Individual Questions

Question	Price Level	Framing	Test value	Actual Proportion	Significance
1	High	Percentage	0,33	0,507	.001
1	High	Absolute	0,33	0,203	.011
1	High	Sale price/reference	0,33	0,290	.243
2	Low	Percentage	0,33	0,174	.002
2	Low	Absolute	0,33	0,391	.142
2	Low	Sale price/reference	0,33	0,435	.035
3	High	Percentage	0,33	0,435	.035
3	High	Absolute	0,33	0,203	.011

3	High	Sale price/reference	0,33	0,362	.282
4	Low	Percentage	0,33	0,101	< .001
4	Low	Absolute	0,33	0,580	< .001
4	Low	Sale price/reference	0,33	0,319	0.428

At the high price level, the percentage framing was chosen significantly more frequently than 33% of the time, indicating that the respondents perceived the highest value from the percentage framing when put in contrast to absolute or sale price / reference price framings, thereby refuting hypothesis H1a. Absolute framings were chosen significantly less frequently than 33% of the time, in direct contrast to previous studies. Sale price / reference price was not chosen significantly more or less frequently than 33% of the time.

At the low price level, the results were more varied. The percentage discount was consistently chosen significantly less frequently than 33% of the time, thereby refuting hypothesis H1b. In question 2 the absolute discount framing was not chosen significantly more frequently than 33% of the time, however, the sale price / reference price framing was. Question 4 showed the inverse, where the absolute framing was chosen significantly more frequently than 33% of the time, while sale price/reference price was not.

To test this further, the same one-sample proportion test was conducted on question 1 & 3 (two high priced offers) and question 2 & 4 (two low priced offers) aggregated. An overview of the results is presented in table 3. Four out of the six tests had significant results, with both percentage framings and absolute framings being significant, and none of the sale price / reference price framings being significant.

Table 3: Results from One-Sample Proportion Tests for Aggregated Questions

Questions	Price Level	Framing	Test value	Actual Proportion	Significance
1 & 3	High	Percentage	0,33	0,471	< .001
1 & 3	High	Absolute	0,33	0,203	< .001
1 & 3	High	Sale price/reference	0,33	0,326	.465
2 & 4	Low	Percentage	0,33	0,138	< .001

2 & 4	Low	Absolute	0,33	0,486	< .001
2 & 4	Low	Sale price/reference	0,33	0,376	.123

When looking at the aggregated results for the two high priced offers, respondents chose the percentage framing significantly ($p < .001$) more frequently than 33% of the time, which strengthens the results from the individually tested questions. Once again, the absolute framing was chosen significantly ($p < .001$) less frequently than 33% of the time, which also strengthens previous results. Sale price/reference price was not chosen significantly more or less frequently, also strengthening previous results.

The aggregated results for the two low priced offers also strengthen the previous results, with percentage framings being chosen significantly ($p < .001$) less frequently, absolute framings being chosen significantly ($p < .001$) more frequently, and sale price / reference price not being chosen significantly less/more frequently than 33% of the time.

Finally, to ascertain that there is a significant difference in the proportions between the two price levels, a paired-samples proportion test was conducted to determine significant differences between the aggregated high and low priced offers. The percentage framing had a significantly higher proportion ($p < .001$) in the high priced framing. The absolute framing had a significantly higher proportion ($p < .001$) in the low priced framing. There was no significant difference ($p = .332$) in the sale price / reference price framing. The results are displayed in table 4.

Table 4: Paired-Sample Proportion Test Between Price Levels

Framing	High-priced proportion	Low-priced proportion	Difference	Significance
Percentage	0,471	0,138	0,333	< .001
Absolute	0,203	0,486	-0,283	< .001
Sale price/reference	0,326	0,377	-0,051	.332

4.2 Effects of Time Constraint on Consumer Preference

To investigate the effects of the time constraints placed on the respondents, the two groups (long or short evaluation time) were compared against each other using several independent-samples proportion tests. The tests were conducted for every question, comparing the proportions of percentage, absolute and sale price / reference price between the two groups for significance. Overall, very few statistically significant differences were observed. The full results can be seen in Tables 5, 6, 7, 8.

In three out of the four questions (Q1;2;4), there is an indication (derived through the proportions of answers) that, although not statistically significant ($p = 0.066; 0.232; 0.115$), respondents with a short evaluation time (stricter time constraint) chose the promotional framing in absolute terms to a greater extent than their long evaluation time counterparts. In two of the four questions (Q1;2) respondents with a short evaluation time had a nearly significantly ($p = .059; 0.051$ respectively) lower preference for price-promotions framed in percentage terms. The other two questions (Q3;4) showed the inverse relationship, although with significantly higher p -values ($p = .27+$). As regards to the sale price / reference price the differences between the two groups were insignificant in all cases but one (Question 4). In question 4, the group with short evaluation time chose the sale price / reference price option significantly less frequently than the long evaluation time group. As the sale price / reference price difference is non-existent in the other three questions, and the second lowest p -value being 0,298, the statistically significant result in question 4 will be considered an anomaly (Madhuri, Usha Rani 2020).

Overall, no support for H2 (Consumers under stricter time constraints will prefer discounts framed in percentage off, as they can rely on existing knowledge structures (heuristics) to gauge its relative strength) was found.

Table 5: Short vs. Long Evaluation Time Question 1

Question	Framing	Exposure time	Proportion	Significance
1	Percentage	Short	0,406	.059
1	Percentage	Long	0,595	
1	Absolute	Short	0,281	.066

1	Absolute	Long	0,135	.350
1	Sale price/reference	Short	0,313	
1	Sale price/reference	Long	0,270	

Table 6: Short vs. Long Evaluation Time Question 2

Question	Framing	Exposure time	Proportion	Significance
2	Percentage	Short	0,094	.051
2	Percentage	Long	0,243	
2	Absolute	Short	0,438	.232
2	Absolute	Long	0,351	
2	Sale price/reference	Short	0,469	.298
2	Sale price/reference	Long	0,405	

Table 7: Short vs. Long Evaluation Time Question 3

Question	Framing	Exposure time	Proportion	Significance
3	Percentage	Short	0,469	.298
3	Percentage	Long	0,405	
3	Absolute	Short	0,156	.185
3	Absolute	Long	0,243	
3	Sale price/reference	Short	0,375	.419
3	Sale price/reference	Long	0,351	

Table 8: Short vs. Long Evaluation Time Question 4

Question	Framing	Exposure time	Proportion	Significance
4	Percentage	Short	0,125	.273
4	Percentage	Long	0,081	
4	Absolute	Short	0,656	.115

4	Absolute	Long	0,514	.049
4	Sale price/reference	Short	0,219	
4	Sale price/reference	Long	0,405	

4.3 Consumer Perception of Discount Depth

To test hypothesis H3a (that consumers will, regardless of evaluation time, under-value the depth of a discount), a series of one-sample t-tests were conducted to test for significant differences between the two subject groups (aggregated) mean estimates and the actual discount depth. When conducting these tests, it was determined that the standard deviation was rather high, and upon visual inspection of the data it could be inferred that four respondents had misinterpreted the task and answered with the before-discount price, rather than the actual discount (percentage or absolute). Therefore, any responses that were ± 2 standard deviations away from the mean were considered outliers and excluded. The tests were repeated, and the full results can be seen in table 9. For three of the four questions, the respondents under-valued the magnitude of the discounts, however, only one of the three was significantly under-valued ($p < .001$). One question was marginally over-valued, and therefore H3a is only partially supported.

Table 9: One-Sample T-Tests of Discount Depth Estimates

Estimate in	Actual Discount	Mean Estimate	Diff.	Sig. Level
SEK1	SEK 1250	SEK 1022,23	SEK -227,77	< .001
SEK2	SEK 25	SEK 23,527	SEK -1,473	.098
Percentage1	17%	17,82%	0,82%	.090
Percentage2	25	23,885%	-1,115%	.092

To begin testing H3b, independent-samples t-tests were run to compare the mean estimates between the two subject groups (long vs. short) for significant differences, which were not found. As no statistical significance was found, H3b is rejected. To look for any indications that time-constraint affects discount-depth estimation accuracy, the means for the two groups were compared (results are summarized in table 10). The long evaluation group was more accurate in two of the cases, and the short evaluation group was more accurate in the other two, with the short evaluation group having a marginally larger absolute average error (9.87% vs. 7.39%).

Table 10: One-Sample T-Tests of Discount Depth Estimates - Between Groups

Estimate in	Eval. Time	Actual Disc.	Estimate	Diff.
SEK1	Short	SEK 1250	SEK 969,17	SEK -280,83
SEK1	Long	SEK 1250	SEK 1067,71	SEK -182,29
SEK2	Short	SEK 25	SEK 23,73	SEK -1,27
SEK2	Long	SEK 25	SEK 23,34	SEK -1,66
Percentage1	Short	17%	18,37%	1,37%
Percentage1	Long	17%	17,36%	0,36%
Percentage2	Short	25%	25,97%	0,97%
Percentage2	Long	25%	23,45%	-1,55%

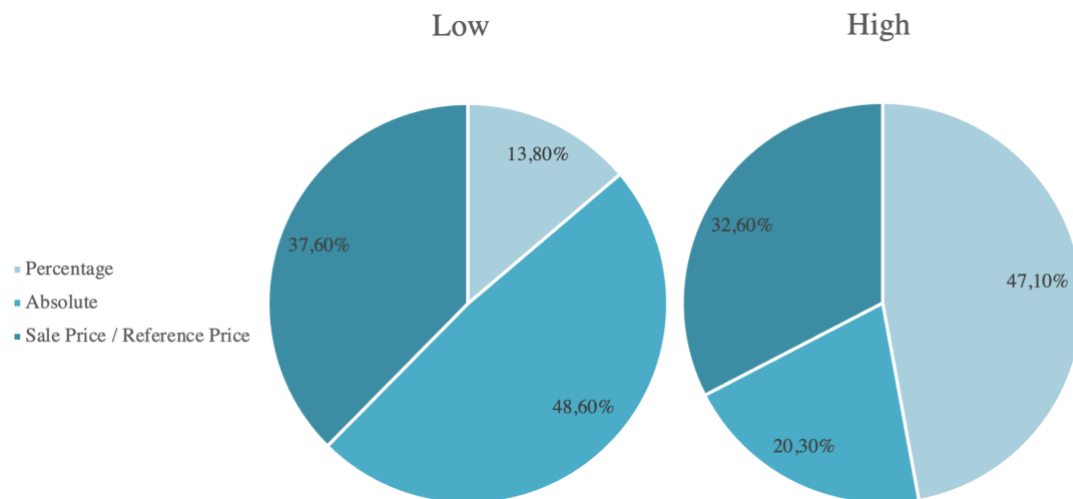
4.4 Summary of Results

The first purpose of this study was to determine consumers preference for three prominent promotional-price framings at different price levels when under different degrees of time constraints. In general respondents preferred the discounts framed in percentage terms at higher price intervals, and in absolute terms at lower price levels. The degree of the time-constraint

had no significant impact on respondents' preference between the different framings, however, the proportion of answer choices indicate that respondents with the short evaluation time may prefer absolute discounts over percentage discounts.

Figure 1: Proportions of Answers for Low and High Price Levels

“Low” refers to questions 2 & 4 aggregated, “High” refers to questions 1 & 3 aggregated.



The second purpose of this study was to determine if consumers under time constraint undervalue the discount depth of a presented offer, and if the degree of the time constraint affects the respondents' accuracy in evaluating the discount depth. We found partial support for respondents undervaluing the discount depth overall, but found no support for any difference in depth estimation accuracy when moderated by time constraint.

Figure 2: Relative Estimation Accuracy for the Four Discount Depth Estimation Questions

Y Axis shows percentage over/under the actual discount in the presented offer (above 1 = overestimation, below 1 = under estimation)

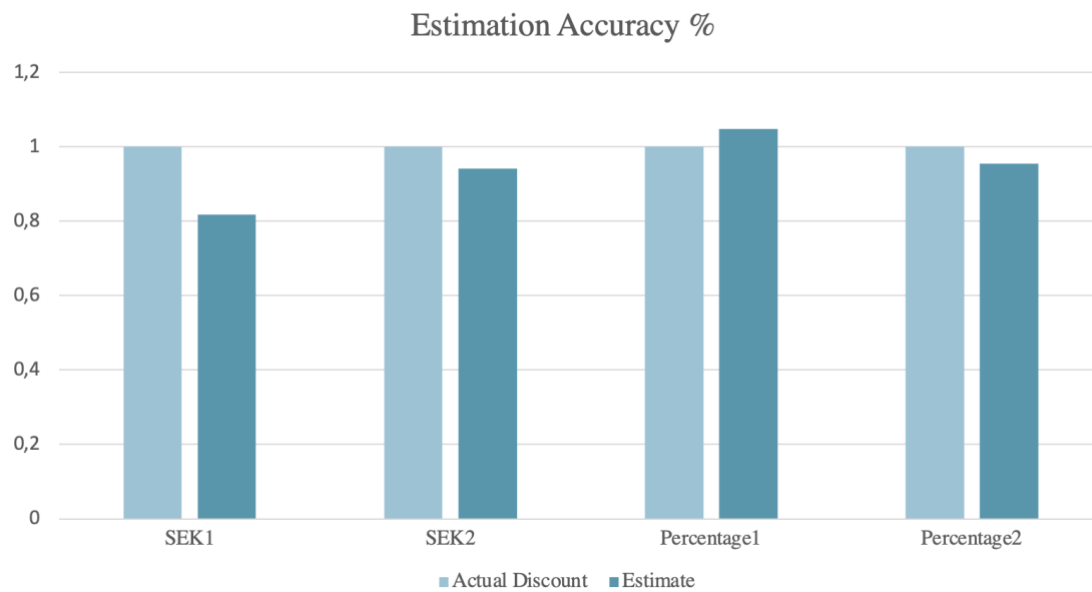


Figure 3: Hypothesis Summary

Hypothesis	Result
H1a: Consumers will perceive higher value when promotions are framed as monetary savings at higher price levels.	Rejected
H1b: Consumers will perceive higher value when promotions are framed as percentage savings at lower price levels.	Rejected
H2: Consumers under stricter time constraints will prefer discounts framed in percentage off, as they can rely on existing knowledge structures (heuristics) to gauge its relative strength.	Rejected
H3a: Consumers will, regardless of exposure time, under-value the depth of a discount.	Partially supported
H3b: The longer a consumer has to evaluate an offer the more accurate they will be closer to the actual discount depth.	Rejected

5 Discussion

5.1 Major Findings

5.1.1 Customer Preference for Promotional Framings

Based on the results from the overall respondent preference for different promotional framings at different price levels: percentage off, absolute discount or sale price / reference price (H1a and H1b), respondents placed under time constraints do not have the same preference for promotional framings as would be indicated by previous research. The rejection of H1a and H1b is in direct opposition to the findings by González et. al (2016) and the indication found in Chen et. al's (1998) research, which indicated that consumers prefer absolute framings at high price levels and percentage framings at low price levels. We instead found that respondents preferred percentage discounts at high price levels, absolute discounts at low price levels and their preference for sale price / reference price was unchanged at the different price levels. When we take the findings connected to H3a into account (outlined in 4.3) we see that the respondents significantly under-valued the monetary value of the percentage discount at the high price level, and marginally over-valued the percentage depth of the discount framed in absolute terms at the high price level. This further confounds the results from part one of the study, as those results would indicate that consumers should find price-promotions framed in absolute terms stronger at the higher price level than those framed in percentage terms. At lower price levels, consumers may have relied on an absolute number heuristic, where they determined the larger absolute number between the absolute and percentage discount to be the best (see González et al. 2016 & (Gendall et al. 2006)). As the monetary discount was larger than the percentage discount at both low-price level questions (125 vs. 25% & 23 vs. 8%) a majority would have, and did, opt for the absolute framing at the low price level.

The reason for the difference between discount depth evaluation (H3a) and preference for percentage framings (H1a & H1b) at the high price level may be because the respondents likely have heuristics associated with discounts in terms of percentages, as those are common and can be applied to most discount framings (customers have established from experience that a 5% discount is not very good, while a 20% discount is quite good). Due to the difficulty in reverse calculating the relative strength of an absolute discount, the respondents may have relied on

those percentage heuristics to evaluate the strength of the offers at the high price level (Chaiken 1980). Another possible explanation is that they may also have relied on an absolute number heuristic at the high price level as well, but only considered the first 1-2 digits due to the large price tag (González et. al 2016). This would mean that they evaluated the magnitude of the discount based on the first 1-2 digits in the presented discount and chose the greatest number of the two. This seems plausible due to the fact that in high-price question 1, where the percentage discount was 20% and the first two digits of the absolute discount was 12, saw a greater preference for the percentage discount than the second high-price question, where the percentage discount was 17% and the first two digits of the absolute discount was 14.

5.1.2 Discount Depth

The findings from the second part of the study, the perceived discount depth of offers (H3a & H3b), partially supported the existing research (see (DelVecchio et al. 2007); (Gupta, Cooper 1992); (Blair, Landon 1981)) - consumers tend to undervalue presented offers (H3a), but found no support for an impact of the moderating variable of time (H3b). H3a is only partially supported because in one of the instances the respondents, although insignificantly, overvalued the depth of the discount. In the other three instances the respondents undervalued the depth of the discounts, and one of them was significantly undervalued ($p < .001$). The moderating variable of time had no impact on the accuracy of the respondents estimates, as there was no statistically significant difference between the mean estimates across the two groups, and therefore H3b is rejected. This may be because respondents were under time constraints in both subject groups, but at different degrees. There may have been a statistically significant difference if the mean estimates were compared against a group with no time pressure at all, but due to the un-supervised nature of the study, respondents could have relied on tools such as a calculator and therefore skewed the results.

5.2 Managerial Implications

The managerial implications are regrettably limited from this study, due to the large pool of insignificant results concerning the effects of time constraint on consumer evaluation of price-promotions. However, we can conclude that for e-commerce retailers the existing pool of research on how to frame price promotions may not be entirely relevant due to the rejection of

H1a and H1b, i.e., that absolute framings are better for high priced products and that percentage framings are better for low priced products (above or below \$100, or SEK 1000). Instead, we found that under time constraint, consumers prefer percentage framings at high price levels and absolute framings at low price levels, which is a tactic that should be applied by ecommerce practitioners. However, if the practitioner lacks the appropriate tools to display price-promotions differently depending on the product's price, the sale price / reference price framing has the least variation in consumer preference across the price levels, and should therefore be employed to ensure good value communication at both levels. The degree of the time constraint had no effect on the perception of the different promotional framings, and therefore ecommerce practitioners do not need to adjust framings depending on how long consumers will be exposed to the offers (5 second YouTube ad, 10 second TikTok ad, etc...).

As for evaluation of discount depth, consumers under time constraint will generally undervalue the depth of a discount, which practitioners should be wary of. This is in line with existing research that does not include the moderating variable of time, and therefore ecommerce practitioners can rely on already researched methods to decrease the severity of the undervaluation, such as novel discount framings researched by Kim and Kramer (2006). The moderating variable of time did not affect the degree of undervaluation, and therefore it is not fruitful for practitioners to pay/fight for more exposure time if the sole purpose for doing so would be to communicate better value for a price-promotion.

6. Limitations and Future Research

Throughout the course of this study, potential limitations and possible improvements to the experiment or survey itself that could be remedied in future research studies came up. Due to the learning from our pre-study, that a few of the respondents noticed that the discounts were all of the same magnitude, the post-discount price levels were slightly adjusted for the three promotional framings in the first part of the study, while the relative (%) discount was kept the same. Despite our best efforts to convey to the respondents that *“we want you to evaluate which offer was the best (best % savings from original price, not cheapest after the discount or largest monetary/SEK saving)”* in the introduction to the first part of the study, in three of the four offers the framing with the lowest post-discount price was the most frequently picked offer, and we can not with certainty determine the impact that it had on respondent choices. In future

studies the post-discount price level can be kept the same, and allow those respondents who do figure out that the discounts are all equal to answer accordingly, later removing them from the dataset. This would likely require a substantially larger sample. Alternatively, the offers can be presented individually, and a series of consumer perception/intention questions can be asked to determine which framing respondents prefer under time constraint, however, there will be a less definitive “this was better than the others” nature of the responses.

Furthermore, we ask the respondents to evaluate which offer they perceived to be the best based on our definition of what is the best offer, while consumers may evaluate offers based on other criteria. This was done in order to ensure that the respondents did not simply pick the products with the lowest post-discount price, however, in a study with the same post-discount price as proposed in the paragraph above, the omission of those guidelines could facilitate evaluations of the best discounts from the respondents own framework rather than a pre-determined, provided framework/definition.

Another limitation was the choice to only evaluate the offers across two different products, which were supposed to be neither exclusively hedonic nor utilitarian. This was not empirically investigated, but rather inferred by the authors due to time limitations. Therefore, it can not be established if the respondents had the same neutral impression of the products as was inferred by the authors. The decision to have neutral products was made to keep the sample size down, as adding another dimension would have doubled the required sample size by bringing the total subject groups from two (long vs. short) to four. An avenue for future research would be to determine if consumers evaluate price-promotions under time constraint differently according to product type. Hedonic products will likely induce higher motivation and therefore induce more systematic processing, a more reliable and accurate processing method, while low-motivation utilitarian products would likely result in more reliance on heuristics and therefore less accurate processing of the actual discounts (Chaiken 1980).

A third limitation was the decision to explore the independent variable of price level within the two subject groups, rather than using a between-subjects model. This was once again done to keep the sample size down, as ensuring that we would have more than 30 valid responses per subject group was of utmost importance. A between-subjects design in terms of price level would have allowed for more offers at more price levels, without risking respondent abandonment or fatigue, than our within-subjects design allowed for. This would have

ultimately led to more analyzable results and possibly more significant results. Furthermore, also concerning price, was the decision to build on the results from González et al. (2016) and convert the threshold price level they investigated from US dollars to Swedish Crowns, thereby increasing the threshold from 100 US dollars to about 1000 Swedish Crowns. This was done for a few different reasons, partially because the number of products that exist under SEK 100 (10 US dollars) is limited, and more often than not of utilitarian nature, and partially because a purchase under SEK 100 is rather insignificant and therefore may require very little thought and therefore would entail low motivation from the respondent. However, the threshold found by González et al. (2016) may not be dependent on the apparent significance of the purchase (which should have translated well across the currencies) but rather rely on number heuristics and how consumers process numbers at different price levels. In future studies, employing a between-subjects design with more distinct price levels could be explored to more accurately determine the threshold for preference of a particular price-promotion.

A possible limitation of this study was the decision to not include a control group, which had no time constraint at all. This was done as one of the purposes of this study was to either confirm or disprove the relevance of existing research on price-promotion framing for e-commerce retailers, an environment in which there is constant competition for customer attention and retailers have incredibly small windows to communicate value to their (potential) customers. Therefore, the previous research acted as a pseudo control group. Another factor that influenced this decision was the fact that the survey was unsupervised, and therefore respondents in the control group could utilize tools such as calculators when evaluating the best of three offers or the discount depth, which would have greatly skewed the results. However, due to the lack of a control group, the differences in our results when compared to existing literature could be caused by, for example, population/demographic differences or cultural differences (how people are used to encountering promotions), however, due to the international social networks of the authors, through which the study was distributed, these factors should have been mitigated.

The environment in which the offers were displayed was not very similar to how consumers would encounter price-promotions at e-retailers, which could have affected the perceived realism of the study. The offers were framed in the three most prominent price-promotion styles, as determined through our desktop market research, however, the actual product displays were void of any “Buy” buttons, ratings, brand names, realistic titles, etc... This was

done in order to avoid external factors influencing consumer perceptions; however, it could have taken away from the realism perceived by the respondents and therefore not induced the same mindset as if any of the offers were encountered “in real life”. Furthermore, no incentive for completing the study was included apart from doing the authors a favor, which could have altered respondent behavior. For future studies, designing a more realistic product listing page, and including some incentive (monetary, charitable, etc...) for the respondents could increase the realism and motivation.

A final suggestion for further research avenues is to determine how the discount depth affects consumer preference for price-promotion framings in a digital, fast moving environment. Absolute number heuristics may affect how consumers perceive percentage off or absolute discounts depending on which number is larger, more so than the price level of the product being promoted. This was acknowledged by Chen et al. (1998) and (Gendall et al. 2006), and investigated by González et al. (2016). However, due to González et al. (2006) investigating in US dollars, the discounts given were never over the 1000 mark, meaning that the first digit in the absolute discount was always larger than in the percentage over 100 US dollars, and the inverse is true for under 100 US dollars, and based on our findings the first 1-2 digits could influence which offer is chosen. Therefore, it would be interesting to investigate whether the first 1-2 digits determine which offer a consumer deems to be the best value, for example: will a consumer choose the percentage discount when a 5000 SEK TV is discounted by 20%, as the absolute discount starts with a 1 (SEK 1000) and $2 > 1$, but the absolute discount when it is discounted by 10% as the absolute discount starts with a 5 (SEK 500) and $5 > 1$.

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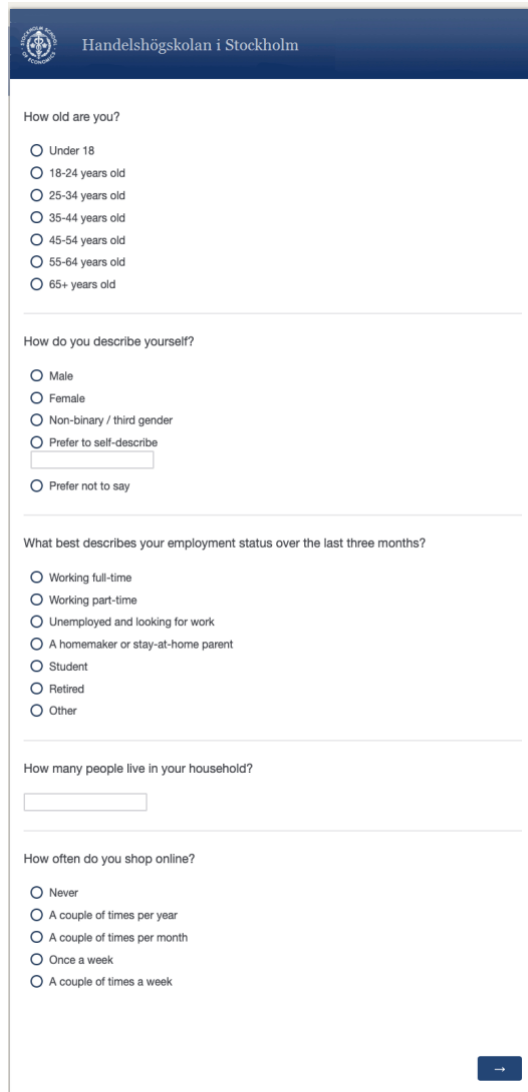
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8. Appendix

8.1 Main Study



The screenshot shows the top of a survey form. At the top is a dark blue header with the logo of Handelshögskolan i Stockholm on the left and the text "Handelshögskolan i Stockholm" on the right. Below the header is a white box with a blue border. Inside this box, the text reads: "Welcome to this SSE bachelor thesis research study!" followed by a paragraph: "The study should take you around 3 minutes to complete. Your participation in this survey is voluntary and you have the right to withdraw at any point during the survey, for any reason, and without any prejudice. Your answers will be completely anonymous, which also means that you can not withdraw your participation once you have completed the survey." At the bottom right of the white box is a small blue button with a white right-pointing arrow.



The screenshot shows the main body of the survey form. It has the same dark blue header as the previous page. Below the header, the questions are listed: "How old are you?" with radio button options: "Under 18", "18-24 years old", "25-34 years old", "35-44 years old", "45-54 years old", "55-64 years old", and "65+ years old". "How do you describe yourself?" with radio button options: "Male", "Female", "Non-binary / third gender", "Prefer to self-describe" (with a text input field), and "Prefer not to say". "What best describes your employment status over the last three months?" with radio button options: "Working full-time", "Working part-time", "Unemployed and looking for work", "A homemaker or stay-at-home parent", "Student", "Retired", and "Other". "How many people live in your household?" with a text input field. "How often do you shop online?" with radio button options: "Never", "A couple of times per year", "A couple of times per month", "Once a week", and "A couple of times a week". At the bottom right is a small blue button with a white right-pointing arrow.



In the following 4 questions you will be shown three different promotional offers from a fictive e-commerce retailer for a very brief moment. We want you to evaluate which offer was the best (best % savings from original price, not cheapest after the discount or largest monetary/SEK saving).

Example:

- A car discounted from SEK 500,000 to SEK 400,000 (-20%) is a BETTER offer than a car discounted from SEK 350,000 to SEK 315,000 (-10%).

- A car discounted from SEK 500,000 to SEK 400,000 (-20%) is a WORSE offer than a car discounted from SEK 100,000 to SEK 70,000 (-30%).

The offers will only be visible for a couple of seconds, so make sure to pay attention.



Timing

These page timer metrics will not be displayed to the recipient.

First Click	0 seconds
Last Click	0 seconds
Page Submit	0 seconds
Click Count	0 clicks

A.



TV 55" 4K

5200:-
~~6500:-~~

B.



TV 55" 4K

5000:-

C.



TV 55" 4K

5100:-



Which offer was the best (A, B or C)?



Timing

These page timer metrics will not be displayed to the recipient.

First Click 0 seconds
Last Click 0 seconds
Page Submit 0 seconds
Click Count 0 clicks

A.	B.	C.
Frying Pan 412:-	Frying Pan 375:-	Frying Pan 389:- 519:-



Which offer was the best (A, B or C)?




Handelshögskolan i Stockholm

Timing

These page timer metrics will not be displayed to the recipient.

First Click0 seconds

Last Click0 seconds

Page Submit0 seconds

Click Count0 clicks

A.

Save 1470:-



UHD

TV 55" 4K7180:-

B.



UHD

TV 55" 4K7055:-
8500:-

C.

-17%



UHD

TV 55" 4K7000:-


Handelshögskolan i Stockholm

Which offer was the best (A, B or C)?

→


Handelshögskolan i Stockholm

Timing

These page timer metrics will not be displayed to the recipient.

First Click0 seconds

Last Click0 seconds

Page Submit0 seconds

Click Count0 clicks

A.



Frying Pan276:-
300:-

B.

-8%



Frying Pan290:-

C.

Save 23:-



Frying Pan262:-

 Handelshögskolan i Stockholm

Which offer was the best (A, B or C)?

→

 Handelshögskolan i Stockholm

In the next two questions you will be shown two offers with a percentage discount, we want you to estimate the approximate savings in SEK for those two discounts.

The price shown in red is the price after the discount.

This is not a math test, so please do not use a calculator in your answers. The offers will be shown for a limited amount of time.

→



Timing

These page timer metrics will not be displayed to the recipient.

First Click	0 seconds
Last Click	0 seconds
Page Submit	0 seconds
Click Count	0 clicks

B.



TV 55" 4K

5000:-



How much did you save in SEK?





Timing

These page timer metrics will not be displayed to the recipient.

First Click 0 seconds
Last Click 0 seconds
Page Submit 0 seconds
Click Count 0 clicks

B.

-8%



Frying Pan

290:-



How much did you save in SEK?



In the next two questions you will be shown two offers with a monetary discount (SEK), we want you to estimate the approximate savings in % for those two discounts.

The price shown in red is the price after the discount.

This is not a math test, so please do not use a calculator in your answers. The offers will be shown for a limited amount of time.





Timing

These page timer metrics will not be displayed to the recipient.

First Click	0 seconds
Last Click	0 seconds
Page Submit	0 seconds
Click Count	0 clicks

A.



TV 55" 4K

7180:-



What was the % discount?





Timing

These page timer metrics will not be displayed to the recipient.

First Click 0 seconds
Last Click 0 seconds
Page Submit 0 seconds
Click Count 0 clicks

B.

Save 125:-



Frying Pan **375:-**



What was the % discount?





Thank you for your participation! What was this survey about?

- ☐ Rating different products
- ☐ Price promotions
- ☐ Different subject lines for advertisements

