SEEKING VALIDATION: GAIN AND LOSS FRAMING AND ITS EFFECT ON CONFIRMATORY INFORMATION SEARCH

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Abstract

Confirmatory information search is the process of seeking and exposing oneself to biased information in support of an individual's prior beliefs. This cognitive operation can often manifest itself through research and information gathering, media consumption, political decision-making, and consumer behavior. This paper seeks to investigate the impact of gain and loss framing on confirmatory information search, exploring how an individual's information-seeking behavior is influenced by prior cognitive biases. A controlled experiment was conducted, randomly exposing participants to a gain-framed and loss-framed version of a product description. Subsequently, participants were prompted to select as many or as few positive and negative customer reviews, serving as the measure of confirmatory information search. My methods feature a multiple linear regression with interaction terms. The results reveal no statistically significant relationship between the exposure to a gain or loss-framed product description and confirmatory information search. Moreover, we find the interaction terms are not significant. We follow this finding with a discussion of the results and potential future research.

ON MY HONOR, I HAVE NEITHER GIVEN NOR RECEIVED UNAUTHORIZED AID ON THIS THESIS

Nova Yu

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Signature

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1. Introduction

In a generation dominated by the ample availability of information, individuals often find themselves in complicated decision-making processes, each choice being fueled by various cognitive biases. Specifically, confirmation bias, a common cognitive bias, is where individuals tend to favor confirming as opposed to disconfirming evidence of their own beliefs (Ellis, 2018). This broadly speaks to a specific cognitive behavior, confirmatory information search. As compared to confirmation bias, confirmatory information search is the process of seeking out information that is only supportive of one's own beliefs (Festinger, 1957). When an individual perceives themselves to be more confident in their decisions, opinions, and prior knowledge, it affects their proneness to confirmatory information search and confirmation biases.

The impact of cognitive biases can range from decision-making in personal relationships to large-scale social implications. The two conceptual systems within people's brains are *System 1* being intuitive and fast, resulting in more error-prone decision-making, and *System 2* being analytical and requires more cognitive effort (Azzopardi, 2021). Cognitive biases are typically present during *System 1* because they help individuals simplify decision-making by reducing the amount of information that needs to be processed (Azzopardi, 2021). Cognitive biases like confirmation bias are commonly thought to have negative impacts. In financial decision-making, investors tend to search and add too much weight to information that is supportive of their existing opinions (Leković, 2020). Behind many high-profile intelligence failures, confirmation biases and overconfidence have been associated with the interpretation behind these failures (Ellis, 2018). In a legal decision-making example, cognitive biases have often led to faulty reasoning from the

client and lawyer's perspective. By understanding cognitive processes, lawyers and clients can avoid conflict by acquiring more reliable information (Weinstein, 2002). Although cognitive biases are intuitively error-prone, the quickness of this decision-making process is argued to encourage people to do their best with their information-processing capabilities (Azzopardi, 2021). Cognitive biases have both positive and negative impacts on decision-making.

Like confirmatory information search, gain and loss framing can have significant impacts on the decision-making process. However, gain and loss framing refers to the way information is presented rather than the active process of information seeking. Framing is used to guide an individual's thinking by including and excluding certain details (Entman, 1993). It is a tactic to present a decision as an opportunity to gain something or avoid losing something and can sway people's choices. In consumer decision-making, it is more likely that an individual will buy two pieces of the same product labeled "two for the price of one" than the same two items at 50% (Leković, 2020). The importance of the combination of gain and loss framing, and confirmatory information search is the ability to influence and elicit behavioral responses. This experiment seeks to test confirmatory information search through the lens of prospect theory and gain and loss framing.

I hypothesize participants who are exposed to gain-framed product descriptions will exhibit higher levels of confirmatory information search. Gain-framed messaging will elucidate increased decision certainty. Participants will be more receptive to confirmatory information search and indicate more heuristic decision-making characteristics. In comparison to participants presented with the loss-framed product description, I hypothesize participants will be less susceptible to confirmatory information search. Participants will become more comprehensive

decision-makers by seeking balanced information and be less sensitive to confirmatory information search.

To test the effect of gain and loss framing on confirmatory information, I created a survey through Qualtrics where participants were randomly assigned to either a gain or loss-framed product description. Participants were asked to evaluate their perceived initial product value using a Simple Multi-Attribute Rating Test (SMART). After, participants were shown positive and negative customer product reviews and asked to select as many or as few reviews as they would like to see more of. The total sample size was 129 participants. The selection of positive and negative customer product reviews was used to measure confirmatory information search in all 4 linear regression runs. Assignment to either gain or loss and the SMART average score were used as the independent variables. Additionally, interaction terms were created to test the relationship between the two variables to determine a potential effect on the dependent variable.

In this experiment, I expect to show that gain and loss framing influences an individual's sensitivity to confirmatory information search through the linear regressions excluding the interaction variable. Moreover, I expect to show that the relationship between gain and loss and confirmatory information search will change dependent on the level of the SMART average scores by testing the interaction term.

The remainder of this paper is structured as follows: Section II discusses the relevant literature and existing theories to gain and loss framing and confirmatory information search, Section III reviews the theory and methodology used to test the hypothesis. Section IV examines Results and Analysis of the 4 regressions, Model 1, Model 2, Model 3, and Model 4. Section V explores practical implications and future

research. Finally, Section VII contains additional information not included in the paper.

2. Literature Review

Since 1979, prospect theory (Kahneman & Tversky, 1979) has become a highly regarded theory within behavioral economics, explaining risk attitudes across various applications. As compared to the fundamental concept of the expected utility theory where individuals base decision-making on maximizing utility and rational thinking, the prospect theory assumes there are other motivators besides maximizing utility that will influence decision-making. The prospect theory is divided into four parts: reference dependence, loss aversion, diminishing sensitivity, and probability weighting (Barberis, 2013). As one of the core concepts of prospect theory, reference dependence is the reliance on a reference point in evaluating gains and losses as opposed to final wealth positions (Kahneman & Tversky, 1979). Loss aversion applies to the concept that individuals have greater responsiveness to losses than gains. Next, diminishing sensitivity states that as an individual's consumption increases, utility, happiness, or perceived value decreases. Finally, probability weighting refers to decision-making based on under-weighting or over-weighting probabilities. Collectively, these conditions aid in explaining the process in which people make decisions in frequent risky situations like investing in the stock market or choosing an insurance plan.

2.1 Gain and Loss Framing

Framing is a common psychological tool that is used to manipulate cognitive processes. To promote a belief or problem, framing selectively takes information and highlights it in communication (Entman, 1993). The function of framing can either define problems, diagnose causes, make moral judgments, or suggest remedies by guiding an individual's thinking through omitting and including certain details (Entman, 1993). A common example is the framing of identical ground beef as either

"75% lean" or "25% fat" (Levin & Gaeth, 1988). The results indicated that consumers determined the "75% lean" beef as more favorable. Although each statement conveys identical information, the framing in terms of "lean" instead of "fat" affected the way consumers perceived the value of the same beef. This is the process of gain and loss framing. Gain-framed messages typically describe a desirable or positive outcome and loss-framed messages describe an undesirable or negative outcome (Toll et al., 2007). Besides categorizing beef, gain-loss framing is commonly used in prevention behavior within the healthcare industry. In a study of the effectiveness of gain-loss-framed messages in smoking cessation, participants were presented with either a gain-framed or loss-framed message. An example of a gain-framed message was "If no one smoked, 430,000 lives would be saved in the United States each year." The loss-framed version of this message was "Because people smoke, 430,000 lives are lost in the United States each year." This experiment found that gain-framed messages may be more persuasive than loss-framed messages in the context of prevention behavior (Toll et al., 2007). However, despite the assumed positive reaction towards gain-framed messages, loss-framing has been equally effective in influencing behavior. When applied to environmental decisions, gain frames were found to increase attitudes about recycling (Loroz, 2007), but loss frames were more successful in encouraging individuals to change recycling behavior (Poortinga and Whitaker, 2018). Overall, individuals participating in a separate environmental consequence experiment found loss framing to be more effective in determining behavioral change (Ropret Homar & Knežević Cvelbar, 2021).

The significance of gain and loss framing is additionally impacted by the potential risk and overall conditions of the following decision. In Kahneman and Tversky's "Asian disease" problem, participants were presented with two programs

that could be potentially adopted to combat a disease predicted to kill 600 people (1979). If the first program is chosen, 200 people will be saved, and if the second is chosen, there is a 1/3 probability that 600 people will be saved and a 2/3 probability that no one will be saved. In this experiment, subjects preferred the certain option that 200 people would be saved (Kahneman & Tversky, 1979). Furthermore, the programs were switched to be viewed through a loss-frame. Instead of lives saved, Kahneman and Tversky framed the programs through the certainty and probability of deaths. In this situation, the risky option was preferred (Kahneman & Tversky, 1979). The loss frame created cognitive conflict which decreased decision certainty (Schneider, 1992). Depending on the context of the gains and losses, either option is effective in promoting specific behavioral outcomes.

2.2 Loss Aversion and Reflection Effect

The intuition behind gain and loss framing is predominantly dependent on risk preferences and personal relevance. As opposed to wealth or welfare, individuals frequently perceive outcomes in terms of gains and losses relevant to a neutral reference point (Kahneman & Tversky, 1979). This reference point usually relates to an individual's current asset position. The perception of outcomes in gains and losses is where loss aversion is more likely demonstrated and observed (McGraw et al., 2010). First introduced by Kahneman and Tversky, loss aversion refers to the human behavior of preferring the avoidance of losses rather than acquiring gains. Loss aversion is directly connected to the psychological phenomenon that "losses loom larger than gains" and has been used to explain behavior like The Endowment Effect and Status Quo Bias (Kahneman & Tversky, 1979). The fundamental theory behind loss aversion helps explain how gain and loss frames can manipulate behavior. When individuals are presented with risky choices, frames are used to elicit feelings of gain

or loss which can change an individual's desire to be risk-seeking or risk-averse (Hamellers, 2021).

Within the prospect theory, the reflection theory explains the reversal in risk preference in gain and loss framing. Gain framing commonly motivates decision-makers to avoid risks and protect the status quo (Kahneman & Tversky, 1979). On the other hand, loss framing evokes motivational mechanisms that push people to become more risk-seeking to prevent loss (Kahneman & Tversky, 1979).

An example is shown below from Kahneman & Tversky (1979) to demonstrate the reflection effect:

Problem 3 (Gain Frame): Choose between

A: $4,000 with a probability of .80, 0 with a probability of .20

B: $3,000

Problem 3' (Loss Frame): Choose between

A: - $4,000 with probability of .80, 0 with probability of .20

B: - $3,000

In Problem 3 (Gain Frame), respondents showed an overwhelming 80% preference for choice B, a guaranteed $3,000, as compared to a 20% preference for choice A. In Problem 3' (Loss Frame) 92% of respondents chose choice A probability instead of a guaranteed loss of - $3,000 which only 8% of respondents chose. In Problem 3 (Gain Frame), most participants chose the risk-averse choice or the sure thing, whereas participants in the loss frame behaved more risk-seeking. The reflection effect illustrates this change in decision-making. Since the emotions felt from loss are larger than emotions from gains, people are likely to take more unusual

chances to recover from losses. This pattern of the switch between risk aversion and risk-seeking is observed in many risk choice situations like political policies, financials, and health.

2.3 Gain and Loss and its Affect on Confidence

Figure 1

Proposed Mechanism

Loss → Sadness Like Emotions → Lower Confidence → Risk-Seeking

Note. This figure is a pathway model describing the cognitive process when an individual experiences loss.

The purpose of gain and loss framing is to influence an individual's perception and attitudes, and this is often accomplished by eliciting emotions like hope, anticipation, fear, and anxiety through gain and loss-specific messaging. Experienced emotions are largely impactful in an individual's confidence during decision-making. When people experience loss, they endure emotions related to sadness. When individuals were asked to interpret emotions of sadness, typically these feelings were felt as if "something (rewarding) is missing" (Raghunathan & Pham, 1999). Loss framing is used to emphasize moments of potential losses. This leverages emotions of sadness and loss aversion to influence people's decision-making and risk preferences. In a study testing the effect of sadness on risky choice decision-making, participants in sad moods tended to prefer the higher risk - higher payoff gamble (Raghunathan & Pham, 1999). When comparing the confidence levels when an individual experiences sadness (loss) or happiness (gain), sadness is often associated with less confidence. As a result of less confidence, people are more likely to extend more effort to reduce uncertainty (Tiedens & Linton, 2001).

2.4 Confirmatory Information Search, Selective Exposure, and Cognitive Dissonance

When individuals are searching for new information, they often seek and agree with pieces of information that are consistent with prior decisions or feelings, known as confirmatory information search (Festinger, 1957). Confirmatory information search is a type of selective exposure. Selective exposure is the broader phenomenon of the cognitive process of preferring information that is favorable to predispositions and disregarding what is believed to be contradictory (Sears & Freedman, 1967). The conflict that individuals face when presented with opposing information comes from Leon Festinger's theory of cognitive dissonance (1957). Dissonance refers to an absence of consistency, like the clash of beliefs or attitudes, and can create psychological friction. This psychological uncomfortableness motivates individuals to avoid dissonance and selectively expose themselves to agreeing information (Harmon-Jones & Mills, 2019). A common example is the knowledge that smoking is bad for your health (Festinger, 1957). A smoker can reduce the dissonance by changing their behavior and stopping smoking or changing their cognition about the negative effects of smoking (Festinger, 1957). Moreover, the selectivity of information typically exists with matters of opinion. Generally, there is a commonality between a person's opinions and information intake that supports their opinion (Sears & Freedman, 1967).

Confirmatory information search is not only dependent on selective exposure and cognitive dissonance, but additionally reliant on motivational factors, such as threat and accuracy motivation. Threats are exposed to individuals daily and range anywhere from personal illness, death, and failure to huge societal and environmental issues (Fischer et al., 2011). These threats impact an individual's decision-making and

vulnerability to confirmatory information search because of its relationship with loss. Accuracy motivation in combination with threats are both drivers of decision-making quality, which refers to the quality of the decision made by the decision-maker (Raghunathan, 1999). Accuracy motivation is an incentive for a correct decision that might cause people to increase the attention given to a task (Thompson et al., 1994). Without accuracy motivation, individuals are more likely to exhibit traits of heuristic decision-making and settle on the most accessible interpretation of information (Thompson et al., 1994). In a study conducting an experiment on decision vs. information focus in information search, it was found that there is a trade-off between the desire to make a correct decision and the desire to minimize effort (Jonas et al., 2008). The results of the experiment confirmed that participants showed increased effort when motivated by making the correct decision as compared to monetary incentives that reduced the overall amount of information search (Jonas et al., 2008).

Although confirmatory information search is not intrinsically dangerous, it does have implications that can adversely affect society on a small and large scale. In the 2008 Financial Crisis that led to one of the most severe economic downturns in American history, investors and other major players chose to ignore the concern of the housing bubble and selectively exposed themselves to information about the promise of future success and prosperity (Fischer, et al., 2011). Occasions such as the 2008 Financial Crisis and the Great Depression are examples of threat and nonthreat conditions. Threat conditions refer to when participants are exposed to potentially harmful and dangerous situations. Nonthreat conditions refer to situations where it is perceived as safe and neutral. In a study testing for confirmatory information search in threat and nonthreat conditions, the results concluded that participants in threat

conditions exhibited lower levels of confirmatory information search than participants who were not in threat conditions (Fischer, et al., 2011). When individuals are in threat conditions, they become more accuracy-motivated and balanced when information searching (Fischer, et al., 2011). Particularly with groupthink, confirmatory search biases tend to increase when a group is faced with threat conditions (Janis, 1982). The impacts of confirmatory search can also be experienced at a personal level. When considering client-advisor relationships, a study found that when presenting information to their clients, mock travel agents gave more information supporting their recommendation than contradicting it (Jonas & Frey, 2003). In this context, although there is the added element of a client-advisor relationship, it continues to support the theory of confirmatory information search and its interdependence on cognitive and motivational conditions.

2.5 Prospect Theory and Confirmatory Information Search

How does gain and loss framing affect an individual's susceptibility to post-confirmatory information search? In studies testing whether gain-framed decisions lead to greater selectivity in information search, participants were asked to make a risky choice in a stock investment scenario. Participants were shown a decision paradigm with probability-based and fixed-outcome investment alternatives. The study results suggested that loss-framed decision problems are accompanied by systematically lower confirmation bias in information search, as shown in **Figure 2** (Fischer et al., 2008). Additionally, these experiments highlighted that participants exposed to gain decision frames exhibited less effort and thus displayed more decision certainty and confirmatory information search as compared to participants disclosed to lose decision framing (Fischer et al., 2008). Participants with higher decision

certainty had higher tendencies of selective exposure and confirmatory information search, as shown in **Figure 3**.

Figure 2

Proposed Mechanism

Loss Frame → Risk-Averse → Lower Decision Certainty, Higher Effort → Decreased Confirmatory Information Search

Note. This figure is a pathway model describing the cognitive process when an individual is exposed to loss-framed messaging.

Figure 3

Proposed Mechanism

Gain Frame → Risk Averse → Higher Decision Certainty, Lower Effort → Increased Confirmatory Information Search

Note. This figure is a pathway model describing the cognitive process when an individual is exposed to gain-framed messaging.

In this experiment of testing the effect of gain and loss framing's impact on post-confirmatory information search, I hypothesize participants who are exposed to gain-framed decisions will exhibit higher levels of confirmatory information search. Gain-framed messaging will elucidate increased decision certainty. Participants will be more receptive to confirmatory information search and indicate more heuristic decision-making characteristics. In comparison to loss-framed decisions, I hypothesize participants will be less susceptible to confirmatory information search. Participants will become more comprehensive decision-makers and be less sensitive

to confirmatory information search.

3. Theory and Methodology

This study tests whether participants exposed to gain or loss-framed product descriptions leads to confirmatory information search, through observing behaviors of initial and post-perceived product value and selection of positive or negative customer reviews.

3.1 Methods

3.1.1 Participants and Design

This study includes 129 participants (65 female, 61 male, 3 non-binary, and between 18-54 years of age and an average age of 32.) from Prolific. Prolific participants are from most OECD countries, except for Turkey, Lithuania, Colombia, and Costa Rica where Prolific is not available. This study went live on Prolific on January 5th, 2024, and ended on January 6th, 2024.

3.1.2 Materials and Procedure

This study was based on the impact of a gain or loss-framed product description of Amazon's Bestseller 4-piece bed sheet set on the selection of positive and negative customer reviews. Participants were asked to evaluate the initial and post-product value before and after being exposed to real and anonymous positive and negative reviews from the Amazon website.

Participants were randomly assigned to either the gain or loss-framed product description. After being shown the gain or loss-framed product description, participants were asked to evaluate their perceived initial product value by answering 3 Simple Multi-Attribute Rating Test (SMART) questions. The SMART questions allowed participants to rate on a scale of *1= (very unlikely or very poor)* to *5 = (very likely or very high)* the product's overall quality and recommendation ability. After participants rated the initial product value, they were randomly assigned to see either

6 positive or 6 negative customer reviews first. Participants were instructed to read each product review carefully and select the reviews they were interested in seeing more of. Participants were told that they could choose as many or as few reviews as they would like. The participants were able to select reviews by clicking a box below each review that stated: “Click this box if you are interested in seeing more reviews like this.” These product reviews all presented opinions on the original product attributes. The positive reviews were rated 4 or 5 stars out of 5, and the negative reviews were rated 1 to 3 stars out of 5. The order of reviews was counterbalanced. Half of the participants saw all the positive reviews first, and the other half saw all the negative reviews first. The order of the reviews was fully crossed with the gain and loss framing. After, participants were shown the positive and negative reviews, they were asked again to determine the product values by answering the SMART questions asked previously.

Figure 4

Product Description

4-piece bed sheet set: 2 pillowcases and a flat sheet and fitted sheet. Flat sheet (102” x 90”) Fitted Sheet (80”x60”) 2 Pillowcases (20”x30”)

General Product Information

Size: Queen

Price: $29.99

Material: Microfiber

Color: 01 - White

Pattern: Solid

Number of Pieces: 4

Included Components: 2 Pillowcases, Fitted Sheet, Flat Sheet

Thread Count: 200

Package Dimensions: 11.89 x 9.84 x 3.27 inches

Machine Washable: Yes

Special Feature: Wrinkle-Free, Deep Pocket

Best Seller's Rank: #1 in Sheet & Pillowcase Sets

Gain Frame Product Description: If you're looking to get a few more hours of sleep, these bed sheets are your best bet! This 4-piece bed sheet guarantees you will be sleeping in **breathable**, **cool**, and **high-quality** microfiber sheets. With these premium sheets, falling asleep will not only be **easier** and **faster**, but your body temperature regulation will be improved, making your sleeping environment more inviting than ever. For an affordable price, **seize the opportunity** to experience ultimate comfort and softness.

Loss Frame Product Description: If you're losing sleep at night tossing and turning, it might be because of your current bed sheets! This 4-piece bed sheet guarantees that you won't be sleeping in your usual **unbreathable**, **hot**, and **low-quality** microfiber sheets. Without these high-quality sheets, your sleeping environment will remain less than ideal, making falling asleep and effective body temperature regulation more **challenging**. For an affordable price, **don't miss out** on the experience of ultimate comfort and softness.

Note. This figure is what participants were shown in the survey. Participants were randomly assigned to either the gain or loss-framed product description. The bolded words or phrases in the product description demonstrate the positive or negative

reflected language in the gain and loss product descriptions. The words or phrases were bolded for participants.

4. Results and Analysis

To measure confirmatory information search, the count of selections of positive and negative customer reviews were averaged for each participant. The positive review selection average and the negative review selection average were used independently as the dependent variables. The independent variables were gain and loss, coded as 1 for gain and 0 for loss, and the averaged SMART question scores prior to seeing the positive and negative reviews. An interaction term was created by multiplying the values for the gain and loss variable and the SMART score variable to determine whether the relationship between confirmatory information search and the gain and loss variable changed depending on the value of the other averaged SMART scores.

4.1 SMART Average

The participants were asked 3 SMART questions about the product's quality and functionality prior to seeing the positive and negative reviews. Each SMART question was scored from 1 to 5. The 3 SMART question scores were averaged for each participant. This average became one of the independent variables. If the average for the SMART score was 5, then the participant scored each question a 5, and if the average for the SMART score was a 1, then the participant scored each question a 1. The SMART average had 129 observations with a maximum average score of 5 and a minimum average score of 1.333. The mean of the scores was 3.490956 signifying participants typically chose a score between 3 and 4. The standard deviation was 0.08015583 meaning the data points are relatively close to the mean.

4.2 Positive Review Selection Average

The positive review selection average had 129 observations with a minimum of 0 and a maximum of 1. If the average for positive review selection was 1, this means

that the participant chose all the positive reviews to see more of. If the average was 0, this means that the participant chose none of the positive reviews to see more of. The mean of the positive review selection average variable was 0.45 meaning the participants typically chose a little less than half of the positive reviews to see more of. The standard deviation of the data was .31, meaning the data points are clustered close to the mean.

4.3 Negative Review Selection Average

The negative review selection average had 129 observations with a minimum of 0 and a maximum of 1. If the average for negative review selection was 1, then the participant chose all the negative reviews to see more of. If the average was 0, then the participant chose none of the negative reviews to see more of. The mean of the negative review selection average was 0.505168 meaning that participants commonly chose half of the negative reviews to see more of. As compared to the positive review selection average, participants were more likely to choose more negative reviews to see more of than positive reviews. The standard deviation of the data was .32, meaning the data points are clustered close to the mean. In the entirety of positive and negative reviews, a 3 out of 5 star review (negative) was chosen the most with 81 clicks, and a 5 out of 5 star review (positive) was chosen the least with 45 clicks.

4.4 Gain and Loss

Participants were randomly assigned to either the gain-framed product description or the loss-framed product description at the survey's beginning. Gain-framed participants were coded as a 1, and loss-framed participants were coded as a 0. 65 participants were assigned to the gain-framed product description, and 64 participants were assigned to the loss-framed product description. Gain and loss was used as the second independent variable.

4.5 Interaction Term

An interaction term was included as the final independent variable. This interaction term was created by multiplying the values of the SMART Average variable and the gain and loss variable. This interaction term was constructed to determine whether the relationship between confirmatory information search and gain and loss framing was moderated by how a participant perceived the overall quality and functionality of the product, or the SMART Average variable.

My analysis method was a linear regression with an interaction term examining the impact of gain and loss and the SMART score averages on positive and negative review selection averages to determine confirmatory information search. Four regressions were completed. For Models 1 and 3, the dependent variable (y_1) was the positive review selection average. For Models 2 and 4, the dependent variable (y_2) was the negative review selection average. Models 1 and 2 included the independent variables gain and loss (GL and the SMART Average). Models 3 and 4 included the original variables with the addition of the interaction term.

$$y_1 = \beta_0 + \beta_1(GL) + \beta_2(SMARTAVG) \quad \text{Model 1}$$

$$y_2 = \beta_0 + \beta_1(GL) + \beta_2(SMARTAVG) \quad \text{Model 2}$$

$$y_3 = \beta_0 + \beta_1(GL) + \beta_2(SMARTAVG) + \beta_3(GL * SMARTAVG) \quad \text{Model 3}$$

$$y_4 = \beta_0 + \beta_1(GL) + \beta_2(SMARTAVG) + \beta_3(GL * SMARTAVG) \quad \text{Model 4}$$

Figure 5

Regression Table

Confirmatory Information Search				
Variable	Model 1 β y_1: Positive Review Selection Average	Model 2 β y_2: Negative Review Selection Average	Model 3 β y_3: Positive Review Selection Average	Model 4 β y_4: Negative Review Selection Average
GL (Gain and Loss)	-0.087	-0.03	-0.010	-0.01
SMART Average	0.069	0.093*	0.080	0.096
Interaction Term (GL*SMART AVERAGE)			-0.22	-.006
$\boldsymbol{R^2}$	0.046	0.056	0.046	0.056
F	0.053	0.027*	0.115	0.065

Note. $p<0.05$

Models 1, 3, and 4 did not show statistically significant results. For Model 1, there was no relationship between selecting positive reviews and whether a participant was assigned to gain or loss or their SMART score average. For Models 3 and 4, since the results were not statistically significant there was no need for the inclusion of the interaction term. There was no relationship between GL or SMART score average and the selection of positive reviews with or without the interaction term. Model 2 showed statistically significant results for the SMART Average. This can be interpreted as what participants scored for the SMART Average affected the average selection of negative reviews. For every 1-unit increase in the SMART Average, there will be a 0.1 increase in the average selection of negative reviews. In addition to these regressions, another two linear regressions were run with 3-way interaction terms.

These regressions included a new variable, whether a participant was exposed to positive reviews or negative reviews first. Although I anticipated there would be a limited likelihood of significant results from this regression analysis, I proceeded with the analysis to thoroughly explore potential relationships within the data. As predicted, the analysis yielded nonsignificant results, suggesting a participant's exposure to the positive reviews or negative reviews first had no significant impact on the joint relationship between the gain and loss variable and the SMART Average variable.

5. Discussion

Overall, the findings of this study are inconsistent with my hypothesis. The goal of this study was to determine whether gain or loss framing of a product description impacted an individual's sensitivity to confirmatory information search. I hypothesized that participants who were exposed to the gain-framed product description would exhibit higher levels of confirmatory search as measured through a higher selection of positive customer reviews compared to negative customer reviews. I hypothesized that the gain-framed product description would emphasize the benefits and positive aspects of the product, leading to a higher perception of product quality, and resulting in a motivation to seek out affirming positive customer reviews. Additionally, I hypothesized that participants who were exposed to the loss-framed product description to be less susceptible to confirmatory information search. I assumed the loss-framed product description would highlight drawbacks and negative qualities of the product, resulting in a lower perception of product quality, and consequently building a desire to select both positive and negative customer reviews.

The results showed that whether participants were exposed to the gain or loss framed product description, there was no statistically significant impact on the selection of positive reviews which was the measurement of confirmatory information search. This contradicts my hypothesis about the impact of gain and loss on the selection of positive reviews. The results from Model 2 show a similar conclusion for the selection of negative reviews, the other measurement of confirmatory information search. Gain and loss framing did not have a notable influence on a participant's selection of negative reviews either. However, Model 2 did display a statistically significant relationship between the SMART scores and the selection of negative reviews. If a participant scored the initial value of the product higher, then there

would be an increase in the selection of negative reviews. This conclusion further counters my initial assumptions of a higher product quality evaluation score leading to a greater selection of positive reviews.

This study has potential limitations. First, the sample of the study could have been impacted by sampling bias. In this study's sample size of 129 participants, certain groups within the population could have been overrepresented or underrepresented, skewing the results of the study to not accurately reflect the broader population. The inability to establish causation could furthermore be a result of an insufficient survey. This survey only presented one example of a gain and loss framed product description. When creating the gain and loss framed product descriptions, there were difficulties with accurately representing and reflecting the product's features, benefits, and drawbacks between the gain and loss framed language. Balancing positive and negative wording while assuring the participant was cognizant of the gain or loss language posed itself to be another challenge. This obstacle was mitigated by bolding the specific phrasing in the product description that was exclusive to either gain or loss. To further avoid this limitation, future research could include more cases of gain and loss framing in scenarios where it is more obvious to participants. Moreover, the initial study included an additional variable that would record the time in between when a participant would click on the page on the positive and negative customer review portion of the survey. As a result of human error, the timing data was only captured for the positive review page and not the negative review page, and the data was unusable. Future research employing a timing-based process tracing method could provide a more precise and detailed understanding of cognitive processing during this study.

If, in fact, the null results of this study are due to limitations and gain-loss framing does impact confirmatory information search, there are a multitude of practical implications that materialize. Firstly, this relationship highlights insights that marketers can use for messaging strategies. Understanding how gain and loss framing affects confirmatory information search allows marketers to align their messaging with their consumer's previous beliefs and preferences. Gain and loss framing can be leveraged to further reinforce confirmatory information search and their consumer's loyalty to their product or service. This reinforcement can help inform various marketing campaigns across channels and platforms by tailoring communication to specific audiences, getting a better grasp of consumer decision making processes, increasing consumer engagement, and generally boosting the ability to persuade consumer's purchasing decisions. Besides marketing messaging, the recognition of gain-loss framing's influence on confirmatory information is useful for various contexts where the intention is to sway decision-making processes. In political campaigns, a candidate can employ gain framing messaging to accentuate positive components of their policies and loss framing phrasing for their opponent. Subsequently, voters who are receptive to the candidate's initiatives and framing will be more likely to seek out information that confirms their beliefs. This perpetuates a reaffirming cycle of support and loyalty for the candidate. Moreover, this approach can be observed in healthcare communication and investment decisions. In conclusion, the understanding of the inter-play between gain-loss framing and confirmatory information search sheds light on consumer decision-making processes and the importance of how messaging strategies influence cognitive biases to achieve a desired outcome.

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7. Appendices

Positive Customer Product Reviews						
Reviewer	**Savannah Douglas**	**Jeffrey King**	**Raheem Sanford**	**Dean Castro**	**Rebekah McConnell**	**Chloe Ferguson**
Star Rating	5/5 Stars	5/5 Stars	5/5 Stars	5/5 Stars	4/5 Stars	4/5 Stars
Review	Buying a Queen bed sheet has certainly brought about some challenges. The primary one has been finding quality sheets that are comfortable, affordable, and don't make me too hot at night. These sheets are great. Extremely comfortable, great color, and doesn't make me too hot overnight. All at a reasonable	I was hesitant about getting these sheets because you can't feel them when you buy online and have to rely on the description and reviews. I have bought sheets in the past that claim to keep you cool but I felt like I was in plastic wrap. All that being said I must admit I am highly impressed with the quality and softness of these	I bought these for our vacation house. My guests love them and asked where we got our sheets so they could order them too. They fit great and feel great. They feel high end was the compliment and they do! I am going to order some more for our other house! I want them in every bedroom. You can not beat the quality and	This sheet set was so inexpensive, half the price of normally inexpensive queen sized sheet sets. That concerned me but the reviews were good so I took a chance, and am I glad I did! The fit is amazing! I have a pillow top mattress, thick to begin with, with a 2" memory foam topper and a thick mattress pad, I assumed it	I washed these sheets immediately and they came out of the dryer soft and wrinkle-free. They are a bit on the thinner side, but are cool and comfortable. Despite the lightweight fabric, they appear to be sewn well and I am hopeful that they hold up well. I was originally skeptical of the microfiber fabric, but these feel closer to a cotton blend than other microfiber sheets I have purchased- without the wrinkles. I do miss the crispness of freshly laundered cotton, but again, these	Right out of the package these sheets were so soft and luxurious feeling. Deep pockets - I have a 4 inch topper on my mattress and these sheets fit good. Have washed a few times - once immediately upon receiving - they have held up well to washing. Are you like me and get confused/overwhelmed with thread count, Egyption cotton, yada yada? I read the reviews on these sheets, crossed my fingers, closed my eyes and ordered. I am so glad that I did!!!! Soft, comfortable and

	price. I'll likely be buying more in different colors.	sheets and the cool these sheets provide. These sheets keep me cool through the night. For whatever reason my body temperature heats up at night and sometimes I wake up sweating but these seem to help regulate the temperature as I sleep and allow the heat to escape. So I stay cozy and warm yet cool at the same time. Since I have put these sheets on I have slept through the night. And	the price is so reasonable.	would be a struggle to make the bed and that the fitted sheet would not really fit. But it fits beautifully, covering the whole mattress with ease. A nice touch is that the top and bottom are marked so you don't have to guess which way the fitted sheet goes. So far it has not slipped off any corners, a very typical problem with all of my other sheets - I haven't had to pull it back down over a corner yet! But the best part is how silky smooth they are,	are so soft that it makes up for it. The color coordinates perfectly with my quilt. Overall, I am happy with these sheets and they seem to be a good value.	durable. Having such a large color selection was just a bonus.

		normally I am up once or twice.		so soft and comfy against your skin. I've only waited them once so far, on heavy duty cycle, and they came out like new. I never saw a thread count but these feel like it's pretty high. They feel like they're going to hold up well. I hope so because I love them so far and plan to buy another set.		

Negative Customer Product Reviews						
Reviewer	**Paige Pierce**	**Noah Lang**	**Brandon Newman**	**Chloe Keith**	**Phillipa Collins**	**Millie Rice**
Star Rating	**5/5 Stars**	**3/5 Stars**	**2/5 Stars**	**2/5 Stars**	**1/5 Stars**	**1/5 Stars**
Review	I needed a new set of sheets. The quality appears to be there with the construction of the sheets. The only thing I noticed is the material is a little thinner than other sheets. Time will tell how long they hold up. They appear to be a value for the price paid for them. They fit perfectly for a thicker queen size bed.	These sheets don't feel like typical microfiber. They're very soft and don't feel hot. They are a little big but not overly so. They just fit loosely. The biggest downside is they're incredibly thin. You can see through the fitted sheet. The overall construction isn't horrible, but it's obvious why they're priced so low. I've washed them twice, and the pillowcases seem as though the hem is	The sheets are thin and flimsy. Every time I make my bed or slip the pillowcase on my pillow, I am worried they will rip. The sheets are advertised to have a cooling effect, but I found the opposite to be true. They have started to pill and the corners on the fitted sheet have lost elasticity after only 3 months of use. I have bought big box store brand sheets that I like MUCH better than these.	These sheets are NOT cooling sheets they are so hot! 3 hours after I woke I went to lay my toddler down to nap and it was still warm as if I had just gotten out of bed. I couldn’t even use my comforter I was hot throughout the night. I wish I could return these but we desperately needed new sheets because our old ones ripped in the wash and these sheets came the same day I ordered it. But I will never get these again. I’m so sad I was	The sheets have a horrible texture to them. When you hold it in your hands it feels soft, but when you actually put it on your bed and lay it in, the sheets pull on you, and on your clothes when you try to move. I try to turn over in bed, but it clings to my shirt and shorts, and my blanket, restricting me from moving. Even without the blanket, there is a lot of friction stopping me from moving my arms and legs	Received these on Oct 12. Washed them Oct 13 and put them in the linen closet. Put them on the bed for the first time on Oct 29. Within 3 or 4 nights of normal use (6-7 hours of sleep/night), the sheets started pilling. Pilling happens when a sheet starts generating tiny flecks of fuzz that get drawn out of the sheets (see image). It happens in very old or very poor quality sheets. If the sheets were old, I'd use a lint roller and/or razor to remove the pilling (because pilling happens to good sheets after long use). But these sheets are brand new, and I will not spend that sort effort

		coming loose. All in all, they're a good product for the price.		hoping I would love these. Only reason I am giving 2 stars instead of one is because I love the color and the color didn’t bleed or fade after I washed it.	smoothly. Couldn’t sleep at all, and had to take the sheets off in the middle of the night to be comfortable.	after just one week of use. So annoyed I have to buy new sheets again. Never buying this brand again. End of review.