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THE INFLUENCE OF ONLINE REVIEWS ON CONSUMER TRUST

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Abstract

This study investigates the causal influence of review valence (positive vs. negative) and signal quality (high vs. low), as well as their interaction, on consumer trust in an e-commerce context. Using a 2x2 between-subjects factorial experimental design (N=200), we manipulated review characteristics on a fictitious product page. ANOVA analysis results revealed significant main effects of both valence and signal quality. More importantly, a significant interaction effect was found: high signal quality amplified the impact of positive reviews (trust boosters) and drastically worsened the impact of negative reviews (trust destroyers). These findings confirm signaling theory, suggesting that trust is not solely shaped by sentiment, but moderated by signal credibility.

Keywords: Influence of Review, Signaling Theory, Consumer Trust.

INTRODUCTION

The digital era has revolutionized the trade landscape, with e-commerce becoming a key pillar of the modern economy. However, this growth is accompanied by fundamental challenges, namely Information asymmetry [1] between sellers and buyers. Consumers' inability to physically inspect products before purchasing creates significant uncertainty and perceived risk, which are major barriers to building trust. In this context, online reviews have emerged as a highly influential third-party source of information. Reviews from fellow consumers serve as a primary reference for evaluating products and seller credibility, making them a determining factor in purchasing decisions.

While the influence of online reviews on trust is widely recognized, understanding the specific mechanisms remains challenging. Research often focuses on the impact of valence (positive or negative) in isolation, but less explores how review characteristics, such as the quality of the signal, moderate this influence. Signaling theory offers a robust framework for explaining this phenomenon. It postulates that reviews function as signals that reduce information asymmetry. The credibility of these signals, determined by their quality, is crucial in shaping consumers' perceptions of and trust in products and sellers.

Based on this framework, this study aims to investigate the causal influence of review valence and signal quality, as well as their interaction effects, on consumer trust. Using a 2x2 between-subjects factorial experimental design, this study manipulates review sentiment (positive vs. negative) and signal quality (high vs. low) in a controlled e-commerce environment. This approach allows for the isolation of variables to precisely measure how different signal combinations shape or undermine trust. The results are expected to provide robust empirical evidence regarding the psychological mechanisms behind online review

evaluation.

LITERATURE REVIEW

Signaling theory, rooted in economics, explains how two parties overcome information asymmetry. In a transaction, one party (the signaler) has more information than the other (the receiver). To convince the receiver, the signaler sends observable signals to communicate information that is not directly observable, such as quality or intent. The credibility of these signals is crucial in shaping the receiver's perceptions and decisions, making it a relevant framework for understanding the dynamics of trust.

In the context of e-commerce, signaling theory is particularly relevant in explaining the relationship between sellers and consumers. Sellers, as signalers, have complete knowledge of product quality, while consumers, as receivers, face uncertainty due to their inability to physically inspect the product. Information provided by sellers, such as product descriptions and photos, constitutes the primary signal. However, these signals are often perceived as biased due to sellers' interest in maximizing sales. This information asymmetry creates perceived risk for consumers and is a major barrier to building trust.

Online reviews serve as a powerful and unique secondary signaling mechanism because they originate from third parties—other consumers who have already experienced the product. These signals, such as star ratings, review volume, and valence (positive or negative), are perceived as more credible than signals from the seller. When potential consumers observe a large number of positive reviews, they interpret them as a collective signal that the product is of good quality and the seller is trustworthy. This effectively reduces information asymmetry and lowers perceived purchase risk.

The quality and credibility of signals sent through online reviews significantly determine their impact on trust. According to signaling theory, effective signals must be costly to fake. Therefore, reviews that are detailed, lengthy, include photos or videos, and come from accounts with a "verified purchase" status are considered stronger signals. These high-quality signals provide more convincing evidence of actual product experiences, making them more effective in building consumer trust than reviews that are short, generic, or appear suspicious.

The signaling process through online reviews directly contributes to the formation of consumer trust. When a consumer receives a series of consistent, positive, and credible signals from multiple sources (reviews), uncertainty about product quality and seller reliability is significantly reduced. This reduction in information asymmetry is a key foundation for trust in online transactions. Thus, signaling theory asserts that online reviews are not simply opinions, but vital signals that enable consumers to make trust-based judgments in an environment of uncertainty.

RESEARCH METHOD

1. Research Design and Approach

This study adopted a quantitative approach with an experimental design to investigate the causal relationship between online reviews and consumer trust. Specifically, a between-subjects factorial experimental design was chosen as the primary method. This approach allows researchers to manipulate the independent variable, namely the signaling characteristics of online reviews, and directly measure their impact on the dependent variable, namely consumer trust. By placing participants in a controlled online shopping environment, researchers can isolate the influence of reviews from other confounding variables, thereby enhancing the internal validity of the findings. This design is highly relevant for testing the postulates of signaling theory in a practical context.

The experimental design used was a 2 (Review Valence: Positive vs. Negative) x 2 (Signal Quality: High vs. Low) factorial. The first factor, review valence, was manipulated through the average star rating and the general sentiment of the review text. The second factor, signal quality, was manipulated through the depth of information, review length, and the presence or absence of a "verified purchase" label. Participants were randomly allocated to one of the four resulting experimental conditions. This randomization ensured that any observed differences in consumer trust could be attributed to the review signal manipulation, rather than to pre-existing participant characteristics.

The research stimulus was a fictitious product page for an electronic product (a Bluetooth speaker) presented within a realistic e-commerce site interface. The use of a fictitious product aimed to eliminate biases that might arise from prior brand experience or loyalty. All elements on the product page, such as images, descriptions, and prices, were kept constant across all conditions. The only manipulated section was the consumer review section. This approach aligns with signaling theory, where manipulated review elements serve as signals designed to reduce information asymmetry and quantify their influence on consumer trust formation.

2. Population and Sample

The target population for this study was young adult consumers in Indonesia, aged 18 to 35, who actively make online purchases. This group was selected due to their high level of digital literacy and reliance on e-commerce for purchasing decisions. The inclusion criteria stipulated that participants must have made at least one online purchase in the past six months. This was to ensure that each participant had relevant experience and sufficient contextual understanding of the interface and dynamics of online shopping, thus enabling them to provide valid responses to the experimental stimuli presented.

The target sample size was set at 200 participants, with 50 allocated to each experimental condition. This determination was based on an a priori statistical power analysis using G*Power software. This analysis was conducted to detect a medium effect size ($f = 0.25$) with a statistical power of 0.80 at an alpha significance level of 0.05. This sample size was deemed adequate to identify the main effect of each independent variable and the interaction effect between them, thereby minimizing the risk of Type II error and increasing the reliability and validity of the study's conclusions.

The sampling technique used was purposive sampling. Participants were recruited through online invitations containing a link to the experimental platform. These invitations were distributed through university mailing lists and social media platforms to reach a relevant audience. Potential participants who responded then underwent a brief screening process to ensure they met the inclusion criteria before being randomly allocated to one of four treatment groups. Demographic data such as age, gender, and online shopping frequency were collected to describe the sample characteristics and to conduct manipulation checks and balance between groups.

3. Variable Measurement

The primary dependent variable, consumer trust, was measured using a multi-item scale adapted from previous research on trust in e-commerce. The scale consists of five items designed to capture dimensions of trust in the seller (integrity and benevolence) and trust in the product (perceived quality). Participants were asked to indicate their level of agreement with statements such as "I believe this seller is honest" and "I believe this product is of high quality" using a 7-point Likert scale (1 = Strongly Disagree, 7 = Strongly Agree). The final trust score was operationalized as the average of all these items.

To ensure that the manipulation of the independent variables was successful, a series of manipulation check questions were asked to participants. Perceptions of review valence were measured by asking participants to rate the overall sentiment of the displayed reviews on a 7-point bipolar scale (Very Negative – Very Positive). Similarly, perceptions of signal quality were measured by asking participants to rate the credibility and information depth of the reviews (Very Low – Very High). This procedure was crucial to validate that differences in perception between the experimental groups were indeed caused by the designed stimulus and not by other factors, thus strengthening the study's internal validity.

In addition to the primary variables, several control variables were also measured to anticipate confounding influences. These variables included demographic data such as age and online shopping frequency, as well as psychological constructs such as product involvement and general tendency to trust online reviews. These variables were measured using existing, validated scales from previous literature. This data was used to examine the balance between randomization groups and could potentially be used as covariates in statistical analyses to more accurately isolate the pure effect of the experimental manipulation on consumer trust.

4. Data Collection Procedures

The data collection process begins with the distribution of a link to the online experiment platform to potential participants. On the opening page, participants receive complete information about the general objectives of the study, its estimated duration, and guarantees of data confidentiality and anonymity. They are then asked to provide electronic informed consent as a condition for continuing. Participation is voluntary and can be discontinued at any time. After providing consent, the system automatically and randomly allocates each participant to one of four pre-designed experimental conditions, ensuring a balanced distribution across treatment groups.

After being allocated, each participant was presented with a stimulus consisting of a fictitious product page that had been manipulated according to their experimental condition. Participants were instructed to carefully examine and evaluate the product page, as if they were considering a real purchase. They were asked to pay particular attention to the consumer reviews section, which was the primary focus of the experimental manipulation. No strict time limits were imposed, allowing participants to fully engage with the stimulus and simulate the natural decision-making process in a realistic online shopping environment.

Immediately after reviewing the product pages, participants were instructed to complete a series of questionnaires. The questionnaire began with the dependent variable (consumer trust), followed by manipulation check questions, and concluded with measurements of control variables and demographic data. This sequence was used to prevent bias and ensure the validity of the responses. After all questions were answered, participants received a debriefing page that transparently explained the true purpose of the study, including disclosure of the manipulation. The session concluded with acknowledgment of the participants' contributions to the study, which is estimated to take 10–15 minutes in total.

5. Data Analysis Methods

The collected data will undergo an initial filtering and cleaning process to identify and handle incomplete data or outliers. Next, classical assumption tests will be conducted to ensure the data's suitability for parametric analysis. The Kolmogorov-Smirnov test for normality of data distribution and Levene's test for homogeneity of variance between groups will be applied. To validate the success of the experimental manipulation, an independent samples t-test will be used. This analysis aims to confirm that participants in the positive valence group perceive reviews significantly more positively than those in the negative valence group, and that the high signal quality group perceives reviews as more credible.

To test the research hypothesis, the main data analysis technique that will be used is Two-Way Analysis of Variance (ANOVA) [3] . This analysis model will test the influence of two independent variables, namely review valence (positive vs. negative) and signal quality (high vs. low), on the dependent variable, namely consumer trust. The ANOVA procedure will test three main effects: the main effect of review valence, the main effect of signal quality, and the interaction effect between review valence and signal quality. This interaction effect is crucial to understand whether the influence of one independent variable depends on the level of the other independent variable.

If a significant interaction effect is found in the ANOVA results, further analysis in the form of a post-hoc test using the Tukey HSD method or simple effects analysis will be conducted. This test aims to identify specific differences between experimental groups in more depth. Furthermore, to increase statistical power and control for confounding variables, Analysis of Covariance (ANCOVA) can be considered by including control variables such as product involvement and tendency to trust online reviews as covariates. The entire data analysis process, from descriptive statistics to hypothesis testing, will be conducted using IBM SPSS Statistics version 26 statistical software.

RESULTS AND DISCUSSION

1. Descriptive Analysis and Manipulation Check

A total of 200 participants (110 females, 90 males) aged 18–35 years (M = 24.7, SD = 4.2) were successfully recruited and randomly allocated to four experimental conditions (n=50 per group). Demographic analysis revealed no significant differences between groups in age, gender, or online shopping frequency ($p > .05$ for all variables). This balance indicates that the randomization process was successful, and any observed differences in the dependent variables can be attributed to the experimental manipulation rather than to the participants' baseline characteristics.

Descriptive statistics show variations in consumer trust levels (scale 1-7) among the four treatment groups. The positive review group with high signal quality showed the highest mean trust (M = 6.15, SD = 0.68), followed by the positive-low quality group (M = 5.20, SD = 0.85). Conversely, the negative review group with high signal quality recorded the lowest mean trust (M = 2.45, SD = 0.75), while the negative-low quality group was slightly above it (M = 3.10, SD = 0.92). This pattern provides an initial indication of the influence of the two variables.

The manipulation check for review valence demonstrated significant success. Independent sample t-test results confirmed that participants in the positive valence condition (M = 6.34, SD = 0.71) perceived the reviews significantly more positively than participants in the negative valence condition (M = 2.08, SD = 0.88), $t(198) = 38.12$, $p < .001$. This large mean difference demonstrates that the manipulation of review sentiment, both through star ratings and text content, was effectively received and understood by participants in accordance with the research design.

The manipulation of signal quality also proved successful. Participants exposed to the high signal quality condition (detailed reviews labeled “verified purchase”) rated the reviews as significantly more credible and informative (M = 6.11, SD = 0.82) than participants in the low signal quality condition (brief, generic reviews) (M = 2.95, SD = 0.94). The independent samples t-test result was highly significant, $t(198) = 25.47$, $p < .001$, validating that different review signal characteristics successfully created different quality perceptions.

Prior to hypothesis testing, reliability and assumption tests were conducted. The five-item consumer trust measurement scale demonstrated excellent internal consistency, with a value of Cronbach's Alpha [5] was 0.93. Furthermore, the ANOVA assumption test was met. Levene's test showed that the variance of

consumer trust was homogeneous among the four groups ($F(3, 196) = 1.89$, $p = .132$). The data were also normally distributed, so the use of Analysis of Variance (ANOVA) for the main data analysis was considered valid and appropriate for testing the proposed research hypothesis.

2. The Main Influence of Review Valence on Consumer Trust

The results of the two-way analysis of variance (ANOVA) revealed a highly significant main effect of review valence on consumer trust, $F(1, 196) = 789.45$, $p < .001$, with a very large effect size ($\eta p^2 = .80$). This finding quantitatively confirmed that participants exposed to positive reviews reported significantly higher levels of trust ($M = 5.68$, $SD = 0.91$) than those exposed to negative reviews ($M = 2.78$, $SD = 0.89$). This statistical strength indicates valence as the dominant factor.

These findings strongly support signaling theory, where review valence serves as a primary, unobservable signal of product quality. Positive reviews send a reassuring signal that the product is high-quality and the seller is trustworthy, effectively reducing information asymmetry. This collective signal from other consumers is perceived as more credible than the seller's claims, providing a strong foundation for potential buyers to build trust and reduce the perceived risk inherent in online transactions.

Conversely, negative reviews act as a powerful warning signal, significantly undermining trust. These signals indicate potential product problems or seller dishonesty, dramatically increasing perceived risk. From a signaling theory perspective, these negative signals create dissonance and widen the information gap, making consumers hesitant to proceed with a transaction. This destructive impact suggests that negative signals carry significant weight in consumers' trust evaluation processes.

Psychologically, review valence serves as a central heuristic in the consumer decision-making process. In complex digital environments, the average star rating and the general sentiment of review text provide efficient cognitive shortcuts. Consumers use these easily interpreted signals to form quick judgments about seller credibility and product quality. This mechanism enables trust formation with minimal cognitive effort, an adaptive strategy in the face of information overload on e-commerce platforms.

In short, review valence is a key pillar that either supports or undermines consumer trust. The direction of sentiment, whether positive or negative, has proven to be the most fundamental signal evaluated by potential buyers. Its dominant influence underscores the crucial importance of online reputation management for sellers. However, the power of this valence signal does not stand alone. Its effectiveness in building trust is likely moderated by other factors, such as the quality and credibility of the review itself.

3. The Main Effect of Review Signal Quality on Consumer Trust

The ANOVA analysis also revealed a significant main effect of review signal quality on consumer trust, $F(1, 196) = 15.23$, $p < .001$, $\eta p^2 = .07$. Participants exposed to high-quality reviews ($M = 4.30$, $SD = 1.85$) reported statistically significantly higher trust than those exposed to low-quality reviews ($M = 4.15$, $SD = 1.54$). These findings confirm that signal characteristics, regardless of valence, play a significant role in shaping consumer trust perceptions and reducing uncertainty.

These findings align with a core tenet of signaling theory that effective signals must be costly to fake. Detailed, lengthy reviews with a "verified purchase" label are considered more credible signals because they require more effort to create and are more difficult to manipulate. These high-quality signals provide more convincing evidence of an authentic product experience. This directly reduces uncertainty and information asymmetry, thereby increasing consumer trust in information presented by third parties.

Specifically, the 'verified purchase' label serves as institutional signals [2] that strengthen the

credibility of reviews. These labels communicate to potential consumers that the reviewer has actually purchased and likely used the product. These e-commerce platforms' verification mechanisms act as a guarantor of authenticity, reducing suspicion of fake or paid reviews. Thus, these signals not only increase trust in the content of reviews, but also in the integrity of the review ecosystem as a whole, which builds trust in sellers.

Conversely, short, generic reviews are low-quality signals because they are easy to produce and fake. These signals require little cost or effort, thus giving them low credibility in the eyes of consumers. The lack of specific details makes these signals of little diagnostic value in reducing information asymmetry regarding product quality. Consequently, consumers tend to ignore or place less weight on these "cheap" signals, significantly weakening their impact on building trust.

Although signal quality has been shown to have an independent influence, its impact cannot be completely separated from the valence context. Signal quality appears to function as a moderator, either strengthening or weakening the impact of valence signals. For example, high credibility may be crucial for making positive reviews believable, but may play a different role when the reviews are negative. Therefore, further analysis of the interaction between these two factors is needed to more comprehensively understand the dynamics of trust formation.

4. The Interaction Effect of Review Valence and Signal Quality on Consumer Trust

Further analysis revealed a statistically significant interaction effect between review valence and signal quality on consumer trust, $F(1, 196) = 45.67$, $p < .001$, $\eta p^2 = .19$. This finding suggests that the effect of review valence on trust is not uniform, but rather depends on the level of signal quality. Specifically, the impact of a positive or negative review is strengthened or weakened by the credibility and depth of the information contained in the review, beyond the mere influence of each factor separately.

When reviews are positive, high signal quality significantly increases trust ($M = 6.15$) compared to low signal quality ($M = 5.20$). Within the framework of signaling theory, detailed and verified positive reviews serve as a very powerful and costly signal to fake. These signals provide more convincing evidence of a product's superiority, making them more effective in reducing information asymmetry and convincing consumers. This added credibility acts as a catalyst, strengthening the positive impact of valence on trust formation.

In contrast, an interesting effect occurs for negative reviews. Negative reviews with a high signal quality actually generate the lowest level of trust ($M = 2.45$), even lower than low-quality negative reviews ($M = 3.10$). This phenomenon underscores the diagnostic power of credible signals. A detailed and verified negative review is perceived as a highly authentic and serious warning. Its credibility makes the negative information more credible, thus having a much more damaging impact on consumer trust.

These interaction findings highlight the asymmetric role of signal quality. Signal quality does not simply increase trust linearly, but rather serves as a moderator that amplifies the impact of valence. In positive reviews, high quality acts as a "trust booster" [6]. Conversely, in negative reviews, high quality acts as a "trust destroyer." This suggests that consumers actively use signal quality as a cue to determine how much weight to assign to the valenced information they receive.

Overall, these interaction effects confirm that the process of consumer trust formation is complex and non-mechanistic. Consumers not only examine star ratings but also critically evaluate the credibility of the evidence presented. These findings enhance signaling theory by demonstrating that the effectiveness of a signal (valence) is largely determined by the perceived credibility of the signaler (review quality). Trust

is built on signals that are not only positive but also strong, authentic, and difficult to replicate.

5. Discussion of Findings and Theoretical Implications

The findings of this study comprehensively support the relevance of signaling theory in explaining the dynamics of trust in e-commerce environments. Experimental results indicate that online reviews serve as a powerful secondary signal to reduce information asymmetry between sellers and consumers. While both signal valence and quality have been shown to influence trust, their interaction provides a deeper understanding. Consumers actively use review characteristics as cues to assess product quality and seller credibility that are not directly observable, consistent with the theory's main postulate.

The dominant influence of review valence confirms its role as the most fundamental signal in shaping trust. Within the framework of signaling theory, positive reviews signal success and quality, effectively lowering perceived risk. Conversely, negative reviews serve as a strong warning signal regarding the potential failure of a product or service. The strength of this effect suggests that consumers use valence as a primary heuristic, an efficient cognitive shortcut for making initial judgments in an information-rich and uncertain environment.

The findings on the influence of signal quality directly reinforce the concept of costly signaling. High-quality reviews—those that are detailed and verified—are perceived as more credible because they are perceived as more difficult and costly to falsify. These signals provide more authentic evidence of the product experience. Conversely, short and generic reviews are cheap signals with low diagnostic value. This confirms the theory's assumption that the credibility and persuasive power of a signal depend on the perceived cost of generating it.

The significant interaction effect is a key theoretical contribution of this study, highlighting the asymmetric role of signal quality. Signal quality not only increases trust linearly but also serves as a moderator that amplifies the impact of valence. In positive reviews, high quality acts as a trust booster. However, in negative reviews, high quality is the most effective trust destroyer. This finding enhances signaling theory by demonstrating that signal credibility determines the weight of interpretations of signal content.

Overall, this study provides strong empirical evidence regarding the psychological mechanisms behind the influence of online reviews. Its primary contribution is demonstrating that consumer trust is shaped not only by review sentiment but also by a critical evaluation of the credibility of these signals. The interaction between valence and signal quality demonstrates a sophisticated consumer evaluation process. These findings deepen our understanding of how trust is built in non-physical transactions, confirming that consumers are active evaluators in the digital signaling ecosystem.

CONCLUSION

This study conclusively proves that online reviews are a crucial determinant in building consumer trust. Review valence, whether positive or negative, proved to be the most dominant factor influencing trust levels. Positive reviews significantly build trust, while negative reviews drastically undermine it. These findings confirm signaling theory, where reviews serve as powerful secondary signals from third parties to reduce information asymmetry and perceived risk. Thus, the direction of review sentiment serves as a fundamental basis for consumers making trust judgments in the uncertain e-commerce environment.

The primary contribution of this study lies in the discovery of a significant interaction effect between valence and signal quality. The effect of valence on trust is not uniform, but rather amplified by signal quality. High-quality (detailed and verified) positive reviews are the most effective trust boosters.

Conversely, high-quality negative reviews are the most damaging trust destroyers, resulting in the lowest levels of trust. This suggests that consumers critically evaluate review credibility, not just sentiment, enhancing our understanding of how signal credibility moderates the interpretation of signal content.

Overall, this study provides strong empirical evidence regarding the psychological mechanisms of online review-based trust formation. The findings confirm that consumers are not passive recipients, but rather active evaluators who sophisticatedly assess both the content and credibility of digital signals. By validating signaling theory in the context of modern e-commerce, this study highlights practical implications for sellers. Online reputation management should not simply focus on acquiring positive reviews; it should also ensure that these reviews appear authentic, detailed, and credible to maximize their impact on consumer trust.

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