The Effects of Non-central Information Cues in Social Media Posts An Eye-Tracking Experiment with High- and Low-Involvement Product Posts

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Abstract

Social media posts typically allow for evaluations of other users. Likes are displayed in non-central areas of a post. In response to criticism for inducing herding effects and social pressure Instagram started to offer feed versions with hidden Like numbers. Drawing on information and social influence theory, we use a 2(Likes: displayed vs. hidden) x 2(Involvement: high vs. low) mixed factorial design to analyze the effects of Like-number-display for high- vs. low-Involvement product posts. Results of the eye-tracking study (N=95) differed between involvement groups: in contrast to high-involvement posts, low-involvement product posts showed longer fixation times in total – and particularly for the non-central Like-area – when Like numbers were displayed than when not. Mixed-ANOVA-results further show marginally significant interaction effects on purchase and eWoM-sharing intention. Implications address differences in eWoM marketing for high- vs. low-involvement products.

Keywords: Elaboration Likelihood Model, Social Influence, Eye Tracking

Track: Digital Marketing & Social Media

1. Introduction

In response to severe criticism, Instagram has first tested and now offers feed versions that do no longer display the number of "Likes" of a post. Instagram's heart-shaped Like icon sends a positive signal to other users, inducing further eWoM-engagement and acting as a reward to the sender of the post (Sherman, Greenfield, Hernandez and Dapretto, 2018). The accumulated number of Likes for photo-posts may exert explicit or implicit social influence on users and may amount to herding effects that motivate individuals to align their preferences and behaviors to the visible behaviors or evaluations of others due to social influence. Prior herding research has primarily focused on one product or market, e.g., for bidder choices in online auctions (Chen & Wang, 2010), and inconclusive herding results have been reported for high- vs. low-involvement products (Ali, Amir and Shamsi, 2021). We aim at contributing to existing research by answering the following research questions:

RQ_1: How do Likes affect attention on high- and low-involvement social media product posts

RQ_2: Do herding effects through Likes differ between high- and low-Involvement products?

To answer these research questions, we employ a 2(Likes: displayed vs. hidden) x 2(Involvement: high vs. low) mixed factorial design with the following dependent variables: (eye) fixation duration on an Instagram product post, as well as eWoM sharing and buying intention. Specifically, we monitor differences in total fixation and Like-area fixation of high- and low-involvement product posts when numbers of Likes are displayed vs. when not displayed. We contribute to SMN management by providing insights into the effects of displaying Like numbers for high- and low-involvement products. We first draw on the herding concept that is grounded in social influence and informational theories before specifying the experimental design, reporting results and deriving implications.

2. Conceptional Background and Hypotheses

Herding denotes a socially compliant behavior (Banerjee, 1992) that depends on the uncertainty about the product involved and the observation of sequential actions of others (Ding and Li, 2019). As such, herding can be categorized as a form of informational social influence and can be viewed in the framework of social influence theory and the Elaboration-Likelihood Model (ELM) of information processing.

2.1. Social influence theory

Social influence denotes the perceived impact of others on a person's perceptions and

behaviors by messages and signals (Venkatesh & Brown, 2001, p. 75). On Instagram, and thus in our study, the effect of observable actions of others is represented by displaying (or hiding) "Like" numbers. With the bulk of photos and videos posted daily, we assume that clicking on "Like" is not the exclusive result of individual preferences but is often socially motivated, e.g., induced by compliance, identification, and/or internalization. We follow Sherman et al. (2018) and Huang et al. (2019) in assuming that Instagram users are more likely to engage when pre-existing Like numbers are displayed than when Like numbers are hidden. We test this assumption with respect to the attention paid to a post, operationalized by total fixation duration and fixation duration of the Like-area; as well as eWoM sharing (i.e., Like and sharing probability) and buying intention. Thus,

H*$_1$: Users are more likely to a) focus their attention on a product post (total and Like-area fixation), b) share eWoM, and c) buy posted products when pre-existing Like numbers are displayed than when Like-numbers are hidden.*

2.2. Elaboration likelihood model (ELM)

The ELM proposes different degrees of information processing depth used by individuals, and suggests two routes of information processing (Petty & Cacioppo, 1986): A central route processing information in a thorough and diligent way leading to a deliberate evaluation of arguments and a peripheral route processing superficial or non-central cues leading to a heuristic evaluation (Li, 2013). The two routes represent the poles of a continuum and which one is taken is determined primarily by two factors: motivation and ability for thorough information processing (Petty & Cacioppo, 1986). Whereas motivation is driven by involvement, personal responsibility and need for cognition, the drivers of ability include the degree of distraction and repetition.

In our study, we focus on the effect of product involvement, i.e., the degree of relevance a person attributes to a product which impacts the motivation to search and process information (Zaichkowsky, 1985). Product uncertainty and therewith the need for risk avoidance should increase with relevance, thus leading to more in-depth, central route processing for high than for low involvement products. Accordingly, we assume that for low involvement products, the peripheral Like-area draws more attention than the central product area and vice versa for high involvement products. We therefore formulate:

H$_2$***:*** *Low-involvement product posts cause a higher degree of peripheral route processing and thus longer fixation of the Like-area of the post, than high-involvement product posts.*

Herding combines social and informational influence. Furthermore, existing research reports

inconsistent results for high- and low-involvement products (Ali et al., 2021). We therefore infer an interaction effect between the number of the Likes-displayed condition and the high- vs. low-involvement condition. Herding theory would suggest a stronger herding effect for high-involvement products due to the higher degree of uncertainty resulting in a higher pressure for conformity (Eisingerich, Chun, Liu, Jia, and Bell, 2015) und reduced effort or attention as opposed to low-involvement products. In contrast, the information processing literature would suggest that the influence of displaying pre-existing Like-numbers (vs. not displaying them) is stronger for low-involvement products due to a stronger focus on the peripheral route, i.e., the Like-area of the post. We therefore assume that high- vs. low-involvement products will be affected differently from the Likes-displayed condition and formulate the following, partially competing hypotheses:

$H_{3.1)/2)}$: *Displaying the number of Likes (vs. hiding them) has a stronger effect on 1) high- (2)low) involvement products regarding (a) 1) reduced (2)increased) attention on the Like-area (peripheral cues) and on increased b) eWoM sharing intention (increased imitation behavior) and c) purchase intention.*

3. Method

3.1. Pre-study

The product photo posts used in the present study were determined by a pre-study in which 76 participants (M_{age} = 24.5 years, SD_{age} = 6.923 years, 45 % male) rated randomized photo-posts (five high-, five low involvement and three filler photo-posts) according to their attractiveness and involvement of the product category on 5-point Likert scales (adapted from Jain & Srinivasan, 1990). Two product pairs of similar attractiveness (M_{low} = 3.833, M_{high} = 3.765, p = .195) but with high discriminating scores on the involvement dimensions (M_{low} = 1.713, M_{high} = 3.647, p < .001) were selected for the present study: (1) high involvement products: sustainable backpack and headphones, (2) low involvement products: woolen socks and sustainable household detergents. One of the three filler posts with similar attractiveness scores to the chosen high and low involvement products photo-posts was selected for the main study ($M_{low+high}$ = 3.798, M_{filler} = 3.96, p = .100). Participants of the pre-study did not take part in the main study.

3.2. Main Study: Participants, design, and stimuli

The study was conducted in Germany where the main Instagram user group is younger than 44 years (NapoleonCat, 2024). Participants (N= 101) were recruited through the university

(students, cooperation partners, alumni, faculty members), active Instagram users (selected with screening questions), and between 18 and 44 years. Six participants were excluded from the analysis due to technical issues resulting in a final data set of 95 participants (M_{age} = 25.74 years, SD_{age} = 7.326 years, 55.8 % male). Eye movements were recorded using Pupil Labs' Invisible eye tracker. Participants were randomly assigned to one of the two conditions (Like numbers displayed vs. not displayed, the between subjects factor) and viewed two high- and low-involvement product posts (the within subjects factor) as well as a filler post. Across these photo-posts, the standard Instagram features, e-WoM-buttons (Like, comment, share) and picture layout were kept constant. In the Likes-not-displayed condition, the Like-area below the photo-posts displayed instead of the Like numbers: "Liked by about_yvi and others". To avoid bias from comments or product descriptions, the photo-posts were only shown up to the Like-area. After viewing the posts, participants filled in a short survey operated via Qualtrics.

3.3. Data preparation

For the analysis, we divided the posts in two areas of interest: a) the "product area" showing the product and b) the "Like area" beneath (see appendix). Fixation durations on each area were extracted with Pupil Labs' reference image mapper. As a proxy for attention, we calculated the percentage of time in which the product vs. the like area of a post was viewed.

4. Results

Separate mixed-factor ANOVAS did not yield a significant main effect of Like-display for any of the dependent variables (total fixation, fixation of Like-area, eWoM sharing or buying intention) and resulted in the rejection of H_1. The pure herding effect across involvement groups was therefore not supported. ELM-based H_2 was supported as the relative fixation durations of product and like area varied significantly by product involvement: For low involvement products, the Like-area was viewed relatively longer than the product area and vice versa for high-involvement products ($Fix\_like\text{-}area_{low\text{-}inv.}$=24.4%; $Fix\_like\text{-}area_{high\text{-}inv.}$=19.8%; p=.042). H_3 tested the interaction effects with the question of whether the effect of Likes-displayed (vs. not-displayed) is stronger for high- than for low-involvement products. $H_{3.1a)}$ was supported, the overall fixation duration of the post was considerably reduced for high-involvement products ($total\_fix_{Hi\_inv.Like\text{-}displ.}$= 3700 ms vs. $total\_fix_{Hi\_inv.Like\text{-}not\text{-}displ.}$= 2700 ms) but increased for low-involvement products when the number of Likes was displayed ($total\_fix_{low\_inv.Like\text{-}displ.}$= 2600 ms vs. $total\_fix_{low\_inv.Like\text{-}not\text{-}displ.}$= 2900 ms).

Figure 1 visualizes this interaction effect (p=.004).

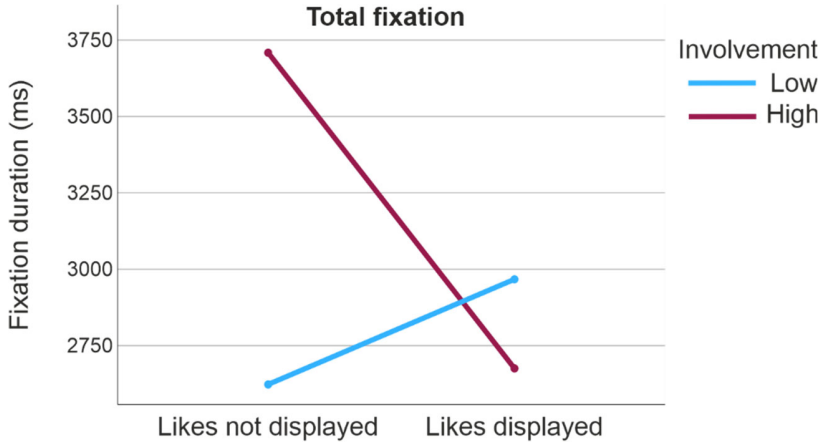

Figure 1: Interaction effect of total fixation time

Additionally, the pairwise comparison showed that in the Likes-not-displayed condition, the difference between high- and low-involvement products is significant (p=.002), whereas in the Likes-displayed condition, we find no significant difference in the total fixation duration between high- and low-involvement products (p=.370). At the same time, we find support for $H_{3.2a)}$. Figure 2 shows the relative as well as the absolute fixation durations of the Like-area (peripheral cues) which is higher for low involvement products when Likes are displayed vs. not-displayed (Like-area _$fix_{low_inv.Like\text{-}displ.}$= 26.6% (856 ms) vs. Like-area $fix_{low\_inv.Like\text{-}not\text{-}displ.}$= 22.2% (675 ms).

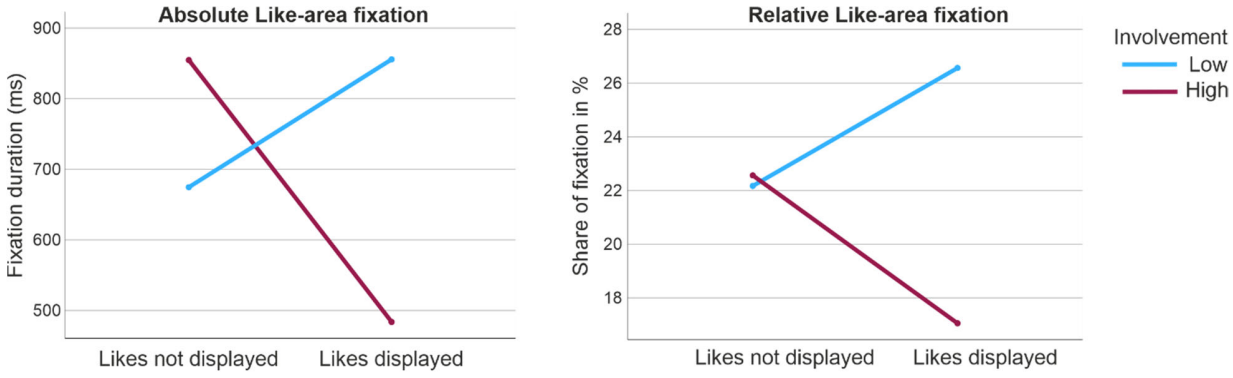

Figure 2: Relative and absolute fixation of the Like-area (peripheral cues)

In contrast, high-involvement product posts show a lower Like-area fixation in the Like-display condition than in the Likes-not-displayed condition (Like-area_$fix_{Hi_inv.Like\text{-}displ.}$= 17.1% (484 ms) vs. Like-area $fix_{Hi\_inv.Like\text{-}not\text{-}displ.}$= 22.6% (855 ms)). The analysis of the relative fixation as well as the absolute fixation times, both show significant interaction effects p=.027 (ms p=.009). As relative fixations of like- and product-area sum up to 100%, the analysis of the relative fixation of

the Product-area yields the reverse picture of Fig. 2, e.g., product-area_fix $_{Hi\_inv.Like\text{-}displ.}$= 82.9%.

The analysis of eWoM-sharing intention (competing hypotheses 3.1b vs. 3.2b) supported $H_{3.2b}$ and therefore the ELM-based, i.e. not the herding-based, assumption that displaying the number of Likes increases eWoM-sharing intention for low-involvement, but not for high-involvement product posts. eWoM-sharing intention for high-involvement products ($M_{high\text{-}inv.}$= 1.8) is generally higher in our sample than for low-involvement products ($M_{low\text{-}inv.}$= 1.6), rendering the main effect of involvement, despite rather small absolute differences, highly significant (p<.001). In the condition with Like numbers displayed, eWoM-sharing intention for high-involvement product posts ($M_{low\_inv.Like\text{-}displ}$ = 1.7) is lower than in the condition without Like numbers displayed ($M_{Hi\_inv.Like\text{-}not\text{-}displ}$ = 1.8). Figure 3 shows the opposite result for low-involvement products where eWoM-sharing intention is higher in the condition with Like numbers displayed ($M_{low\_inv.Like\text{-}displ}$ = 1.6) than in the condition without Like number displayed ($M_{low\_inv.Like\text{-}not\text{-}displ}$ = 1.5). However, the interaction effect is only marginally significant (p<.100). Within the condition Likes not displayed, we find significant differences between high- and low-involvement product posts ($M_{low\_inv.Like\text{-}not\text{-}displ}$ = 1.5; $M_{Hi\_inv.Like\text{-}not\text{-}displ}$ = 1.8, p<.001).

The results of purchase intention neither support herding-based $H_{3.1c)}$ nor ELM-based $H_{3.2c)}$. The interaction effect is significant (p=.029). However, differences in the Like-display condition are only significant within the high-involvement product category, but in contrast to herding theory, purchase intention is higher when Likes are not displayed ($M_{Hi\_inv.Like\text{-}not\text{-}displ}$ = 2.2) than when Likes are displayed ($M_{Hi\_inv.Like\text{-}displayed}$ = 1.9, p=.050). Figure 4 shows that purchase intention for low-involvement products is higher in the Likes-displayed condition ($M_{low\_inv.Like\text{-}displayed}$ = 2.0) than in the Likes-not-displayed condition ($M_{low\_inv.Like\text{-}not\text{-}displayed}$= 1.9), however, the difference is small and nonsignificant (p=.880).

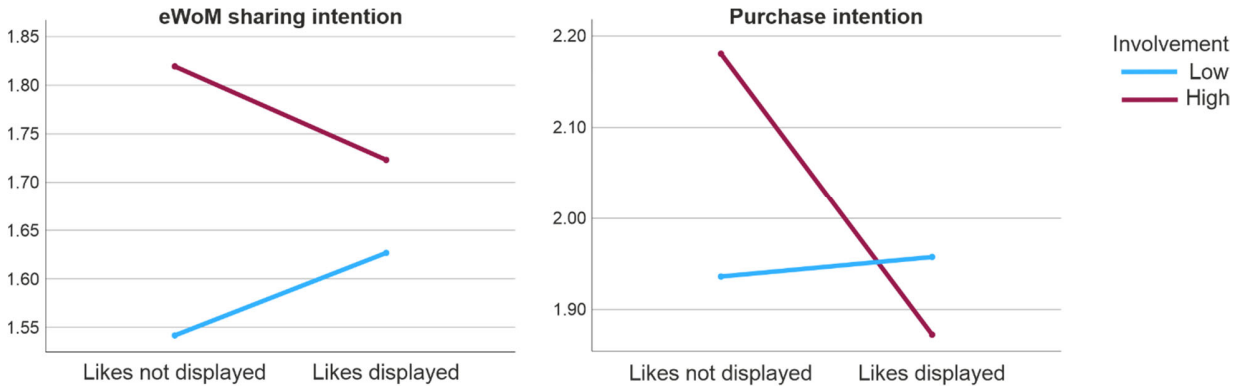

Fig. 4: Interaction effect for eWoM-sharing intention and purchase intention

5. Discussion

Our pivotal result shows significant (or at least marginally significant) interaction effects between the Like-display and the involvement condition with opposing Like-display effects between high- and low-involvement products posts across the dependent variables. The different directions of the social influence effect between the product involvement groups may account for the non-significant main effect of Like-display and the rejection of H_1. This result contributes to explaining incongruent results in prior herding research across involvement groups. We also contribute to ELM research by supporting H_2. The relative fixation of the Like-area is higher for low- than for high-involvement products whereas the relative fixation of the product-area is higher for high- than for low-involvement products. Overall, we were able to connect social influence as well as ELM with eye-movement. In line with herding theory that e.g., posits that effort is reduced when signals of others are visible, high-involvement products received less attention (lower fixation duration) when Likes were displayed vs. not-displayed. We find no corresponding effect for low-involvement products where uncertainty (herding pre-condition) is lower.

Our research supports the approach of connecting social influence theory with information processing theories. For the fixation of the Like-area, eWoM-sharing, and purchase intention, our results favor the ELM-based (in contrast to the herding-based) hypotheses. Higher Like-area fixation when Likes are displayed, were found only for low-involvement product posts, whereas high-involvement product posts show significantly lower results in the Likes-display-condition indicating a stronger focus on the product-area. This would not suggest indicating reduced effort as herding posits. However, a reduced fixation of the Like-area could also be a result of the Like-not-display version ("Liked by about_yvi and others") which may take longer to process than a certain number of Likes. However, we don't see the corresponding effect for low-involvement products.

Herding theory would further suggest that eWoM-sharing and purchase intention for high-involvement products is higher when Likes are displayed than not-displayed, but we found this tendency only for low-involvement products whereas high-involvement product posts show the opposite effect for purchase intention and a tendency for reduced eWoM-sharing intention.

6. Implications and Limitations

Our results have different implications for marketing high- vs. low-involvement products on

social media. Displaying the number of Likes in social media posts seems favorable especially for low-involvement products as relative and absolute attention for the Like-area increases here. For marketing high-involvement products on social media, we cannot recommend displaying Like-numbers based on our research results. High-involvement product posts seem to receive higher attention with qualitative (name, expert) than quantitative (Like number) recommendations. For low-involvement product posts, displaying mere Like-numbers may help, but not suffice to induce eWoM sharing and buying intention as our only marginal significant results suggest. Rather those peripheral cues should be complemented by additional, e.g., sustainability cues.

Our survey concluded with questions about knowledge and usage of hiding Like-numbers that Instagram grants its users. Most participants (>62%) know this function, but only 30% seem to use it. Platform managers may want to implement the option for companies to target social media users differently depending on their Instagram settings, especially depending on the setting of the Like numbers (displayed or not).

The lab conditions of our study did not allow for a larger sample size; however, a larger sample may have led to more precise, i.e., significant instead of marginally significant results. Moreover, we have tested a number of covariates from the social influence theory (tendencies for identification, compliance, and internalization) in an attempt to bring the social-influence theory and ELM into alignment. Future research may succeed here by integrating additional constructs. Eventually, the lab-controlled eye-tracking conditions do not perfectly resemble the natural conditions under which consumers use Instagram even though we used a mobile eye-tracker.

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Appendix