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Illegally beautiful? The role of trust and persuasion knowledge in online image manipulation disclosure effects

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ABSTRACT

The accessibility of powerful photo editing tools has caused image retouching and manipulation to become widespread among sponsored social media content. Images in sponsored posts featuring influencers are often edited to reflect unrealistic body proportions, potentially harming consumers if they compare themselves to unattainable beauty standards. In response to this trend, regulators in different countries have moved to consider or adopt disclosure policies; however, disclosure practices and their effects have not been extensively studied. An online experimental study ($N = 480$) identified that low- and high-detail disclosures of image manipulation lowered consumer trust. Decreased trust led consumers to use their persuasion knowledge, resulting in less favorable attitudes toward both the brand and influencer, reduced interest in seeking more information about the brand, and diminished body comparison. Finally, implications for various stakeholders, including content creators, brands, and policy-makers, are discussed.

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sponsored content; image manipulation; disclosure; trust; persuasion knowledge

Introduction

Image retouching, or manipulation, has become a ubiquitous tool in advertising, social media content, or magazines. While earlier practices of image retouching comprised techniques of airbrushing with the goal of reducing the appearance of skin imperfections (Crosson 2014), the advancements in picture editing software have led to more extensive image manipulation practices (Knoll 2020), often altering a model's appearance to conform to unrealistic beauty standards (Hancock and Toma 2009). In the United States and many other countries, the practice of image retouching is common but does not usually require any disclosure (e.g. US Congress 2014; UK

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Parliament 2022). Thus, consumers may be exposed to images that deceptively convey an unattainable body image (Crosson 2014; Knoll 2020).

The exposure to such retouched images has been linked to the development of distorted beauty standards that negatively affect one's body image (Grabe, Ward, and Hyde 2008; Couture Bue and Harrison 2020; Naderer, Peter, and Karsay 2022) and may bolster health conditions such as eating disorders and depression (Smolak 2004; Dittmar 2009). In response to the retouching practices, public interest organizations and policymakers have advocated for transparency and clear guidelines in image retouching practices (e.g. Krawitz 2014; Lubitz 2015; Naderer, Peter, and Karsay 2022). However, resulting disclosures may not adequately inform consumers about the nature and extent of image retouching, as regulations and guidelines differ across countries and often remain vague as to how retouching should be disclosed.

Despite the prevalence of image retouching in advertising, the effects of disclosures attempting to mitigate potentially serious consequences of image retouching have drawn relatively little attention from scholars. While several studies have examined the effects of the presence of image retouching disclosures in advertising (Schirmer et al. 2018), research on the effects of the type and extent of information included in such disclosures remains limited, particularly in a social media context.

This study aims to address the dearth of research on image retouching disclosures by examining the effects of: (1) specificity of image retouching disclosure (a general and vague disclosure that indicates the photo has been retouched, a more specific disclosure that indicates what region or body part has been retouched, a highly specific disclosure indicating exactly how the image has been retouched, and the absence of a disclosure as a control) and (2) the role of cue-based trust and persuasion knowledge as potential mechanisms driving consumers' attitudinal and behavioral brand-related responses as well as body comparison. This study is guided by the signaling theory, trust, and persuasion knowledge literature, which is reviewed in the following literature review section.

Literature review

Digitally altered messages

With the advancement of computer technology over the last several decades, advertisers have regularly manipulated aspects of ads to make them more appealing to consumers (Campbell et al. 2022). Ad manipulation describes any technique used to alter an ad during the pre-production, production, or post-production stages (Rust and Oliver 1994). Especially post-production alterations, such as image re-touching and manipulation, have become a popular tool for advertising and other persuasive messaging through social media, magazines, commercials, or websites (Ahn 2019). In the past, retouching was done primarily using analog airbrushing techniques to make skin appear smoother or unblemished (Crosson 2014; Campbell et al. 2022). Today, much of the retouching and manipulation are conducted using software such as in-app filters (Campbell et al. 2022) or Adobe Photoshop (Knoll 2020), which can digitally alter the appearance of a subject, often to inhuman and unrealistic proportions (Crosson 2014). This practice has been linked to the development of unrealistic

body standards and self-body image disturbances (Thompson et al. 1999; Abraham 2011; (Tiggemann et al., 2017); Ahn 2019; Knoll 2020), as well as reinforcing health conditions like eating disorders and depression (Smolak 2004; Dittmar 2009).

Content creators as influencers

Social media influencers, content creators who have amassed a following on various social media platforms (Evans et al. 2017) and post content for compensation (Campbell and Farrell 2020), play a significant role in disseminating digitally altered messages, particularly when collaborating with brands. By carefully curating and editing content, influencers aim to present an idealized image of themselves and the products they endorse, leveraging their trusted status among social media users. As influencers are seen as a trusted source by other social media users (Campbell and Grimm 2019), influencers' messages can boost brand awareness (Lou and Yuan 2019) and influence consumer knowledge, attitudes, and behavior (Enke and Borchers 2019; Hudders, De Jans, and De Veirman 2021), such as their judgments about brands and purchases through successful use of three broad clusters such as influencer characteristics (e.g. influencer-brand congruence), message features (e.g. storytelling), and media (Lou and Jin 2024).

Influencer content often involves the proliferation of digitally altered imagery and, thus, contributes to unrealistic beauty standards and idealized body portrayals, which have been linked to decreased body satisfaction (Panjrath and Tiwari 2021). Social comparison (Festinger 1954), the process of individuals evaluating themselves in relation to others, has been identified as a mechanism for social media image exposure on body image (Tiggemann and Zaccardo 2015; Brown and Tiggemann 2016, 2020; Dignard and Jarry 2021; Panjrath and Tiwari 2021). Social comparison theory (Festinger 1954) posits that individuals possess an innate motivation to compare themselves to others and make inferences about themselves, their abilities, and their opinions, especially in the absence of objective information. Social comparison is particularly relevant on social media, as these platforms offer ample opportunity to make comparisons with peers (Tiggemann 2022). When individuals compare themselves with the biased or edited portrayals of influencers and fall short, they experience dissatisfaction with their own bodies (Prichard, Taylor, and Tiggemann 2023). As influencers, unlike celebrities, aim to represent consumers and exude authenticity and trustworthiness, the impact of their digitally altered imagery on consumer perceptions and behaviors is further amplified (Chae 2018, Jin, Muqaddam, and Ryu 2019; Schouten, Janssen, and Verspaget 2020).

Disclosures and their policies

Because of the potential risks to young adults and other consumers related to photo manipulated commercial imagery, countries including France, Israel, and Norway have implemented laws and policies mandating a disclosure to identify when digital manipulation has been used (Krawitz 2014; Lubitz 2015; Stortinget 2021). The United States (US Congress 2014) and the United Kingdom (UK Parliament 2022) do not yet require such disclosures but have proposed similar regulation to address potentially negative

consequences of deceptive image editing practices (US Congress 2014; UK Parliament 2022). The purpose of image manipulation disclosures would be to inform consumers that an image they are viewing has been edited and would, therefore, not be an appropriate frame of reference for relative comparison and evaluation of oneself. While the effectiveness of such disclosures has not been extensively studied, the theoretical construct of trust may hold implications for understanding disclosure effects.

The role of trust in consumer responses

The concept of trust has been widely studied and primarily understood as an important factor in developing interpersonal relationships, particularly in risky or uncertain situations (McKnight, Choudhury, and Kacmar 2002; Pfeuffer and Huh 2021). Trust formation is often understood as being shaped by collective interactions and relationships of prior experiences. In this study, trust formation and influencing factors are understood based on individuals forming quick initial judgments and impressions when encountering advertisements with image retouching disclosures, which may serve as heuristic cues for trust (Pfeuffer and Huh 2020; Wang 2001). Trust cues can be used for trust formation in the absence of significant previous experiences (Pfeuffer and Huh 2020). Wang (2001) defines such cue-based trust as an individuals' assurance in a trusted party provided from indications offered by or related to the trusted party.

In the context of disclosure specificity of digitally altered messages, consumers may use such disclosures to inform their trust formation in the influencer and brand and subsequent responses (e.g. Pfeuffer and Huh 2020). The development of cue-based trust may be explained by Signaling Theory (Spence 1973).

Signaling theory and disclosure specificity

Signaling Theory refers to the uncertainty or vulnerability between buyers and sellers in an interactional relationship (Spence 1973). In such situations, sellers often hold more information than buyers; however, sellers may choose to intentionally make information that may otherwise be limited or hidden to buyers to mitigate uncertainty (Kirmani and Rao 2000). Signals purposefully made available by sellers *via* content features and product characteristics (e.g. sponsorship disclosures) have been found to affect consumer evaluations of the sellers and products (Huh and Shin 2014; Pfeuffer and Huh 2020; Pfeuffer and Phua 2022).

It is important to note, however, that signaling does not invariably lead to more favorable outcomes. Although the majority of signaling literature has focused on intentional and positive signaling (Connelly et al. 2011), some initial insights exist regarding the effects of unintentional and negative signals. When sellers send signals that are unintentional or negative, such signals could interfere with intentional signals or communicate unfavorable information (Mavlanova et al. 2015). Research on the effectiveness of positive and negative signals in the context of online shopping, for example, has shown that negative signals can significantly interfere with positive signals; consumers infer a website to be of higher quality when positive signals are present and negative

signals are absent. Additionally, consumers weigh signals differently, with costlier, that is to say more resource-intensive signals, exerting a stronger effect (Mavlanova et al. 2015).

Given that brands and content creators would have little influence over whether an image manipulation disclosure would be placed if policy required them, these disclosures hold the potential to convey information that interferes with the intended favorable message of the content or communicate information that would lead consumers to make negative inferences about a content creator or brand. Research drawing on signaling theory in the sponsorship disclosure context has found that disclosures of sponsorship, whether they specifically inform about the terms of sponsorship or not, reduce consumer cue-based trust (Pfeuffer and Huh 2020).

By applying the underlying assumptions of signaling theory and cue-based trust literature, the presence of an image retouching disclosure and specific detail revealed in the disclosure would function as an initial signal to consumers to make inferences about the branded message, which would influence consumers' trust and, subsequently, attitudinal and behavioral responses. A more specific disclosure detailing exactly what has been altered would provide information to consumers about image manipulation practices used in the sponsored content, leading consumers to make a negative inference about the ethical practices and intentions of the content creator and sponsoring brand. Greater levels of specificity would affect perceptions of integrity and benevolence toward the consumer, thereby reducing consumer trust in the content creator and brand (Mayer, Davis, and Schoorman 1995). Thus, we would expect increasing disclosure specificity to serve as gradually clearer negative signals about the intentions of the content creator and brand, leading to incrementally lower trust in the content creator and brand.

H1: More specific disclosures will result in decreased trust in the content creator and brand when compared to (a) the absence of disclosures and (b) less specific disclosures.

Negative signals provided by the presence and specificity of image manipulation disclosures would also be likely to shape attitudinal responses toward the entities involved in the content, leading to less favorable attitudes toward the content creator and brand. Additionally, negative signals would affect consumers' behavioral responses, reducing their likelihood to search for additional information on the brand or comparing themselves to the influencer depicted in the content. Finally, more specific disclosures would indicate more explicitly that the images of individuals they are seeing do not constitute an appropriate point of social comparison, diminishing consumers' inclination to compare their bodies to those portrayed in the post:

H2: More specific disclosures will lead to (a) less favorable attitudes toward the content creator and brand, (b) decreased search intention, and (c) lower body comparison when compared to less specific disclosures.

Disclosure messages may also alert consumers to the persuasive nature of the social media content, and resulting consumer responses may be explained by the Persuasion Knowledge Model.

The role persuasion knowledge in consumer responses

The Persuasion Knowledge Model (PKM) describes and predicts the interplay between the parties involved in a persuasion episode, the persuasion agent and the persuasion

target (Friestad and Wright 1994). During a persuasion episode, each party can rely on knowledge they possess about the topic of the persuasion, the other party, and persuasion itself to inform coping behaviors. Particularly the latter, persuasion knowledge (PK), has been the focus of scholarly inquiry. Research in the advertising context has shown that when PK is activated, a change of meaning can occur that leads to critical processing of information and frequently results in less favorable evaluations of an advertised product (e.g. Boerman, Van Reijmersdal, and Neijens 2012; Boerman, Willemsen, and Van Der Aa 2017).

The PKM distinguishes between conceptual persuasion knowledge (i.e. advertising recognition) and attitudinal persuasion knowledge (i.e. evaluative judgments about the persuasion, such as perceived appropriateness of effectiveness), all of which may influence consumer responses to a persuasive message (Friestad and Wright 1994; Boerman, Willemsen, and Van Der Aa 2017). Disclosures have been shown to increase consumers' conceptual persuasion knowledge, increasing their understanding of persuasive intent (e.g. Boerman, Willemsen, and Van Der Aa 2017; Evans et al. 2017; Pfeuffer et al. 2020). Additionally, disclosures have been shown to affect attitudinal aspects of PK, such as perceived effectiveness and appropriateness, which also shape consumers' PK and subsequent attitudes and behaviors (Pfeuffer et al. 2020; Lim, Evans, and Primovic 2021; Evans et al. 2022; van Reijmersdal et al. 2023).

The relationship between trust and persuasion knowledge

Much of the persuasion knowledge literature posits that persuasion knowledge influences trust formation (e.g. Boerman et al. 2018), conceptualizing trust as experiential trust, which is based on cumulative experience with another party (Wang 2001). The present study, however, conceptualizes trust as a cue-based construct that aids consumers in building an initial level of trust based on content attributes that act as heuristic cues for trust. This cue-based trust is necessary for consumers to build an initial level of trust for them to engage with the content in the first place (Wang 2001; Pfeuffer and Huh 2020; Pfeuffer and Phua 2022). Consequently, the effects of disclosures on cue-based trust would precede consumers' persuasion knowledge activation. Currently, research on the relationship between cue-based trust and persuasion knowledge remains limited (Pfeuffer and Phua 2022). However, the link between initial trust formation and subsequent persuasion knowledge activation is supported by journalism research focusing on the role of initial trust in media outlets in consumers' news message processing. This research identified that lower trust levels led to increased persuasion knowledge (e.g. Chen and Cheng 2020; von Sikorski 2022). In the context of Facebook, for example, trust in the platform as a news source affected consumers' persuasion knowledge of a fake news article, increasing their perceived manipulative intent of the content (Chen and Cheng 2020). In a study on the effects of visual cues and media trust on evaluation of political candidates, von Sikorski (2022) argued that lower media trust led to an activation of persuasion knowledge, making consumers more skeptical of mediated information about political candidates and leading to more favorable evaluations of these candidates.

When these study insights are applied to the context of this study, we predict that consumers' perceptions of integrity, benevolence, and ability, that is to say, the

subdimensions of trust, resulting from exposure to disclosures of varying specificities would allow them to engage with the content and shape their perceptions of the influencer's intent, as well as their perceptions of the appropriateness and effectiveness of the persuasive message. Thus, lower levels of trust would lead to a less favorable application of persuasion knowledge, with less favorable perceptions of the influencer's intent, and lower perceived appropriateness and effectiveness:

> **H3:** Lower consumer trust would lead to less favorable activation of consumers' persuasion knowledge. Specifically, lower consumer trust would be associated with less favorable perceptions of the influencer's intent and lower perceived appropriateness and effectiveness.

Serial mediation via trust and persuasion knowledge

If image manipulation disclosures, as suggested by signaling theory and disclosure effects literature, serve as a negative signal to consumers, leading to reduced trust in a content creator and brand, persuasion knowledge subdimensions would conceivably be affected by lower trust as follows: First, the perception of the influencer's intent would be influenced. Specifically, the perception that the influencer is acting in the consumer's interest would be reduced as the influencer would likely be perceived as acting in their own interest. Additionally, lower trust may result in reduced perceptions of appropriateness of the content as well as effectiveness of the message. The use of this persuasion knowledge would likely lead to less favorable attitudinal and behavioral outcomes and alert consumers that an influencer in the content they are viewing would not constitute a reliable frame of reference for comparison of one's own body. Thus, we predict the following:

> **H4:** The indirect effect of disclosure specificity will be serially mediated by trust and persuasion knowledge such that more specific disclosures will lead to decreased trust and, subsequently, decreased favorable aspects of persuasion knowledge, thus resulting in (a) less favorable attitudinal responses, (b) decreased search intention, as well as (c) lower body comparison.

Method

To address the study's hypotheses, an online experiment was conducted ($N = 480$ U.S. adults). The study followed a 4-condition (3 levels of disclosure specificity [general, low-detail, high-detail] plus a control condition), between-group design.

Sample characteristics

Participants' ages ranged from 18 to 82 years ($M = 37.30$, $SD = 14.15$). Approximately half the participants ($n = 239$, 49.8%) identified as male, 230 participants (47.9%) as female, and 9 (1.9%) as non-binary; 2 participants (.4%) preferred not to disclose their gender. The majority of participants ($n = 382$, 79.6%) self-identified as White, while 37 (7.7%) identified as Black or African American, 39 (8.1%) as Asian, 3 (.6%) as American

Indian or Alaskan Native, and 1 (.2%) as Native Hawaiian or other Pacific Islander. Additionally, 13 participants (2.8%) identified as "Other" and 5 (1.0%) preferred not to disclose their race. Most participants had completed at least some college ($n = 407$, 84.8%) and earned annual family household income of less than $100,000 before tax ($n = 374$, 77.9%).

Stimuli design

For the experiment, 8 fictitious sponsored Instagram posts were created manipulating the image retouching disclosure specificity (see Figure 1). To examine potential confounding effects of perceived similarity between the influencer and consumer, the influencer's gender was manipulated as well; eight posts featured an apparently female influencer while the other eight included an apparently male influencer. Stock images were purchased to keep images featured in all conditions' posts as consistent as possible (e.g. the same image background, similar pose, and similarly colored clothing), only differing in image retouching disclosure specificity following the experimental design. The posts, furthermore, indicated to have been sponsored by a fictitious skin care brand, dermatologie. This was done to improve ecological validity as existing regulation requiring image manipulation disclosures specifically pertain to sponsored content. The product category of skin care was selected because it constitutes an experience good (Pfeuffer and Huh 2021), a product that is difficult to evaluate prior

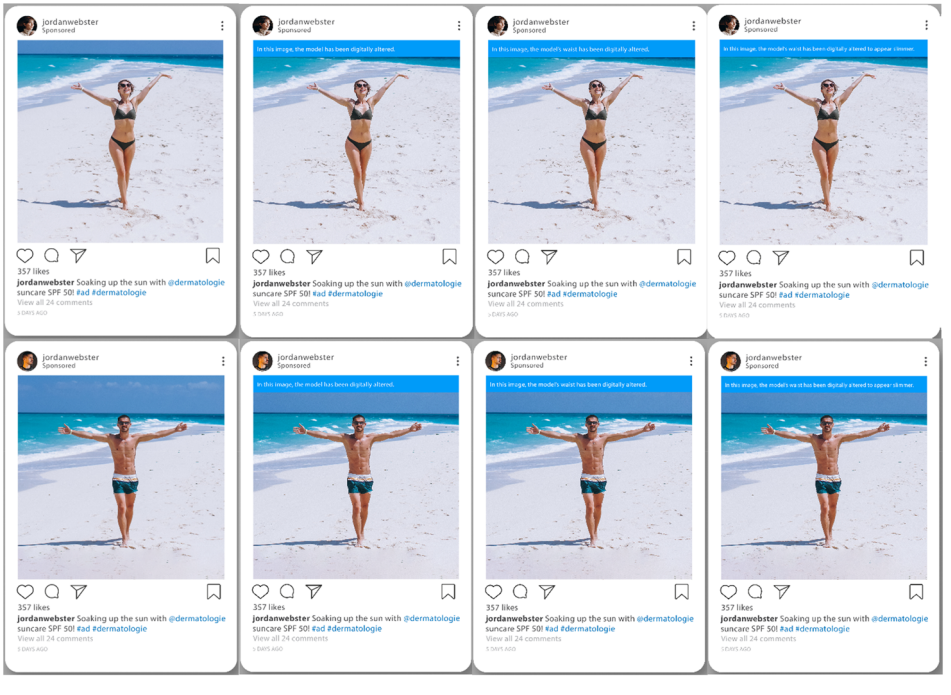

Figure 1. Experimental stimuli by disclosure specificity condition.
Note: The stimuli above are for the control, general, low-detail, and high-detail conditions (from left to right). Participants were randomly assigned to one of the conditions and models.

to trial (Nelson 1970), because consumers rely more on electronic word-of-mouth (eWOM) for such goods (Park and Lee 2009).

Procedure

Participants were recruited using the Prolific sample service. After providing consent, participants were asked to fill out a questionnaire asking about demographics and potential control variables. Then, participants were exposed to the stimulus corresponding to their randomly assigned condition, after which participants answered a questionnaire assessing their trust, conceptual and attitudinal persuasion knowledge, attitudes toward the reviewer and brand, engagement in eWOM, and body satisfaction.

Measures

Trust in the brand and content creator was measured in terms of its subdimensions of perceived integrity, benevolence, and expertise. *Perceived Integrity* of the brand (Cronbach's α = .95) and content creator (Cronbach's α = .90) was measured using a four-item Likert scale measure adapted from Moorman et al.'s (2012) Leader Integrity Scale.

Perceived Benevolence of the brand (Cronbach's α = .95) and the content creator (Cronbach's α = .92) was measured using a five-item Likert scale measure (Colquitt and Rodell 2011). *Perceived Expertise* of the brand (Cronbach's α = .97) and the content creator (Cronbach's α = .92) was assessed using six Likert scales modified from Mayer and Davis (1999).

Persuasion Knowledge was measured by assessing its subdimensions of perception of the influencer's intent (i.e. conceptual persuasion knowledge) and perceived appropriateness and effectiveness (i.e. attitudinal persuasion knowledge). *Perception of the Influencer's Intent* was measured using a five-item Likert scale measure (Cronbach's α = .95) evaluating perceived consumer orientation (Jeong and Lee 2013). Lower consumer orientation would thereby express a content creator's genuine intent to help consumers rather than simply persuading them for a sale, indicating less favorable perceived intent. *Perceived Appropriateness* was assessed based on Campbell's (1995) five-item Manipulative Intent Scale (Cronbach's α = .93). *Perceived Effectiveness* was measured using a four-item Likert scale measure based on Celsi and Gilly (2010) (Cronbach's α = .93).

Attitude toward the content creator was measured using a set of four semantic differential scales (Cronbach's α = .95), while *attitude toward the brand* was measured on six semantic differential scales that were adapted from MacKenzie, Lutz, and Belch (1986) (Cronbach's α = .97).

Behavioral outcomes measured include the intent to search for the product online. *Search Intent* was evaluated based on Kim et al. (2017) four-item Likert scale measurement (Cronbach's α = .92).

Finally, *Body comparison* was assessed using a three-item semantic differential measure modified from Tiggemann and McGill (2004) State Appearance Comparison

Scale (Cronbach's α = .96). All measurement items used either 7-point Likert scales or differential scales. Scale items are listed in Tables 1 and 2.

The study also assessed a variety of demographic and potential confounding factors. *Demographics* were recorded with participant age, biological sex, race and ethnicity, education level, and household income. As *potential confounding factors*, product involvement, skepticism of online consumer product reviews, product involvement, and trust propensity were examined.

Measurement models

Two measurement models were assessed differing in the trust and attitudinal variables that were included. The first model correlated consumers' attitudes toward the content creator, trust in the content creator, persuasion knowledge, search intent, and body comparison. The second model correlated attitudes toward the brand, trust in the brand, persuasion knowledge, search intent, and body comparison.

IBM AMOS 29 was used to assess the fit of two proposed measurement models of image manipulation disclosure effects with a full information maximum likelihood estimation. There was no missing data, and bootstrapping with 1000 replicates was used to account for any nonnormality of the data. To assess measurement model fit, comparative fit indices (CFIs), root mean square errors of approximation (RMSEAs), and standardized root mean square residuals (SRMRs) were used.

Model assessing the role of trust in the content creator

Fit indices of the initial confirmatory factor analysis (CFA) were not satisfactory for the trust in the content creator, $\chi 2$ (743) = 2766.80, $p < .001$; CFI = .92; RMSEA = .07, 90% confidence interval [CI] [.07, .07], p-close < .001, SRMR = .05.

As factor loadings of all latent variables in the model were acceptable (see Table 1), modification indices were considered to improve upon the proposed model. The addition of error covariances for correlated scale items within the same constructs resulted in improved model fit, $\chi 2$ (740) = 1898.75, $p < .001$; CFI = .95; RMSEA = .05, 90% confidence interval [CI] [.04, .05], p-close = .25, SRMR = .05.

Model assessing the role of trust in the brand

Indices for the initial CFA of the model assessing the role of trust in the brand already show a reasonably well-fitting model, $\chi 2$ (824) = 2367.72, $p < .001$; CFI = .95; RMSEA = .06, 90% confidence interval [CI] [.05, .06], p-close = .001, SRMR = .04. As latent variables' factor loadings (see Table 2) were examined and deemed acceptable, modification indices were consulted, and appropriate error covariances within two latent constructs were correlated to improve the model, $\chi 2$ (822) = 1749.70, $p < .001$; CFI = .97; RMSEA = .04, 90% confidence interval [CI] [.04, <.05], p-close = 1, SRMR = .04.

Convergent and discriminant validity

Convergent validity of the models was assessed based on the Fornell-Larcker criterion (Fornell and Larcker 1981). As both the AVE and CR scores of all latent variables in the two models were above .70 (see Tables 1 and 2), the models were considered to

Table 1. Trust in brand model.

Factors and Items	Factor Loadings	CR	AVE
Perceived Benevolence Brand		.95	.78
The brand …			
- … is very concerned about the viewers' welfare.	.89		
- … cares about the viewers' needs and desires.	.88		
- … would not knowingly do anything to hurt the viewers.	.84		
- … really looks out for what is important to the viewers.	.93		
- … will go out of its way to help the viewers.	.87		
Perceived Integrity Brand		.95	.83
The brand is …			
- … guided by a clear moral compass	.87		
- … respectful to others.	.92		
- … fair.	.96		
- … honest.	.88		
Perceived Expertise Brand		.97	.83
The brand …			
- … is very capable of creating a high-quality product.	.90		
- … is successful at creating a high-quality product.	.91		
- … has much knowledge within the product category.	.90		
- … is skilled in creating a high-quality product.	.93		
- … has specialized capabilities that make it apt at producing a high-quality product.	.91		
- … is well qualified to produce a high-quality product.	.93		
Perceived Appropriateness		.93	.68
- The way this post informs people seems acceptable to me.	.76		
- The content creator tried to manipulate the audience in ways that I don't like.[1]	.72		
- I was annoyed by this post because the content creator seemed to be trying to inappropriately manage or control the viewer.[1]	.70		
- I didn't mind this post; the content creator was not manipulative.	.82		
- This post was fair in what was said and shown.	.94		
- I think that this post is fair.	.96		
Perceived Effectiveness		.93	.76
- This post will increase sales of the featured product.	.87		
- The post will be well-liked by viewers.	.87		
- The post effectively raises visibility of the product.	.84		
- The post is effective at positively influencing viewers' opinions about the product.	.90		
Perceived Persuasive Intent		.95	.78
The content creator tries to …			
- … help viewers buy better products.	.85		
- … address the needs of viewers.	.90		
- … offer the most helpful information to viewers.	.92		
- … keep the best interest of viewers in mind.	.90		
- … make navigating many product choices easier.	.84		
Attitude toward Brand		.97	.86
The Dermatologie brand is …			
- Bad:Good	.93		
- Dislikable:Likable	.94		
- Unfavorable:Favorable	.96		
- Unpleasant:Pleasant	.93		
- Negative:Positive	.93		
- Poor quality:High quality	.87		
Search Intent		.91	.72
How tempted are you to do any of the following?			
- Tell a friend about this post[2]	.70		
- Make an effort to seek out more information	.95		
- Tell a friend about the brand[2]	.81		
- Go on the brand's website	.92		
Body Comparison		.96	.88
When viewing the social media post' to what extent did you…			
- … think about your own appearance?	.91		
- … compare your overall appearance to that of the person in the post?	.98		
- … compare your specific body parts to those of the person in the post?	.92		

Note: Items with the same superscript number were correlated.

Table 2. Trust in content creator model.

Factors and Items	Factor Loadings	CR	AVE
Perceived Benevolence Content Creator		.93	.72
The content creator …			
- … is very concerned about the viewers' welfare.	.86		
- … cares about the viewers' needs and desires.	.87		
- … would not knowingly do anything to hurt the viewers.	.68		
- … really looks out for what is important to the viewers.	.91		
- … will go out of their way to help the viewers.	.90		
Perceived Integrity Content Creator		.91	.71
The brand is …			
- … guided by a clear moral compass	.76		
- … respectful to others.	.89		
- … fair.	.92		
- … honest.	.78		
Perceived Expertise Content Creator		.92	.65
The brand …			
- … is very capable of presenting the product.[1]	.71		
- … is successful at presenting the product.[1]	.80		
- … has much knowledge about the product.	.79		
- … is skilled at presenting the product.	.89		
- … has specialized capabilities that make them apt at presenting the product.	.80		
- … is well qualified to present the product.	.84		
Perceived Appropriateness		.93	.68
- The way this post informs people seems acceptable to me.	.76		
- The content creator tried to manipulate the audience in ways that I don't like.[2]	.72		
- I was annoyed by this post because the content creator seemed to be trying to inappropriately manage or control the viewer.[2]	.70		
- I didn't mind this post; the content creator was not manipulative.	.82		
- This post was fair in what was said and shown.	.94		
- I think that this post is fair.	.96		
Perceived Effectiveness		.93	.76
- This post will increase sales of the featured product.	.87		
- The post will be well-liked by viewers.	.86		
- The post effectively raises visibility of the product.	.85		
- The post is effective at positively influencing viewers' opinions about the product.	.90		
Perceived Persuasive Intent		.95	.78
The content creator tries to …			
- … help viewers buy better products.	.85		
- … address the needs of viewers.	.90		
- … offer the most helpful information to viewers.	.92		
- … keep the best interest of viewers in mind.	.90		
- … make navigating many product choices easier.	.84		
Attitude toward Content Creator		.95	.83
The content creator is …			
- Not a nice person:A nice person	.86		
- Very unfavorable:Very favorable	.92		
- Very unpleasant:Very pleasant	.93		
- Very dislikable:Very likable	.93		
Search Intent		.91	.72
How tempted are you to do any of the following?			
- Tell a friend about this post[3]	.70		
- Make an effort to seek out more information	.95		
- Tell a friend about the brand[3]	.81		
- Go on the brand's website	.92		
Body Comparison		.96	.88
When viewing the social media post' to what extent did you…			
- … think about your own appearance?	.91		
- … compare your overall appearance to that of the person in the post?	.98		
- … compare your specific body parts to those of the person in the post?	.92		

Note: Items with the same superscript number were correlated.

have good convergent validity per the Fornell-Larcker criterion.To establish discriminant validity, heterotrait-monotrait ratios (HTMT) of correlation values were employed as suggested by Henseler, Ringle, and Sarstedt (2016). All of the HTMT values in each model were below the recommended threshold of .90 (Henseler, Ringle, and Sarstedt 2016), thus establishing good discriminant validity of the constructs in both models. Overall, the two models' constructs showed good convergent and discriminant validity.

Results

Randomization check

Randomization checks did not show statistically significant differences in the participants' age (F (3, 475) = 1.45, p = .23), gender ($\chi 2$ (12, 480) = 8.15; p = .77), race ($\chi 2$ (21, 480) = 15.17; p = .81); ethnicity ($\chi 2$ (3, 480) = 1.51; p = .68); or education ($\chi 2$ (18, 480) = 22.34; p = .22). However, a significant difference between conditions was identified for household income ($\chi 2$ (12, 470) = 22.22; p = .04). Thus, randomization was considered largely successful in terms of participant demographics with the exception of household income, which was controlled during hypothesis testing. Randomization checks were also conducted on potential confounding variables. No significant differences were found across the experimental conditions in terms of product involvement (F (3, 476) = 1.95, p = .12) and skepticism of online consumer product reviews (F (3, 476) = .35, p = .79), product involvement (F (3, 476) = 1.95, p = .12), and trust propensity (F (3, 476) = 2.53, p = .06).

Potential confounding effect of influencer gender

To ascertain that influencer gender did not exert a confounding effect of perceived similarity between the influencer and consumer, the influencer's gender was also manipulated in the study. No differential effects were found of influencer gender on the study outcomes of trust in the content creator (F (1, 478) = 2.29, p = .13) and brand (F (1, 478) = .73, p = .40), persuasion knowledge (F (1, 478) = 1.12, p = .29), attitude toward the content creator (F (1, 478) = 1.83, p = .18) and brand (F (1, 478) = 1.12, p = .29), and body comparison (F (1, 478) = 1.26, p = .26).

Path models

To test the study's hypotheses, a structural equation modelling approach was used. To assess the role of trust in the content creator as well as in the brand in image manipulation disclosure effects on consumer responses, two separate models were created. Path model 1 assessed effects of disclosure specificity on attitudes toward the content creator, search intent, and body comparison *via* trust in the content creator and persuasion knowledge (see Figure 2). This model exhibited reasonable fit, $\chi 2$ (917) = 2428.60, $p < .001$; CFI = .94; RMSEA = .05, 90% confidence interval [CI] [.05, .06], p-close = .06, SRMR = .06.

Path model 2, on the other hand, tested effects of disclosure specificity on attitude toward the brand, search intent, and body comparison *via* trust in the brand and persuasion knowledge (see Figure 3). Path Model 2 was a well-fitting model, $\chi 2$ (1007)

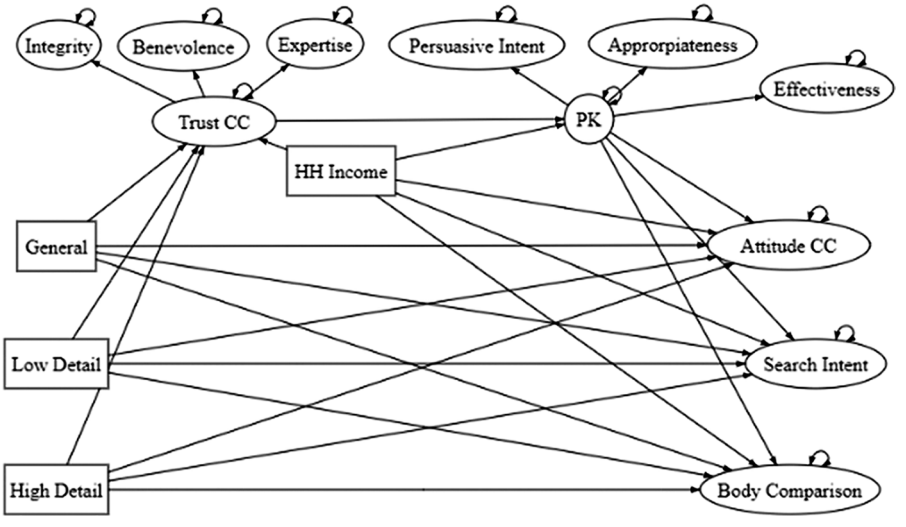

Figure 2. Path model 1.
Note: Path model 1 assesses disclosure specificity effects on consumer attitudes toward the content creator, search intent, and body comparison via trust in the content creator and persuasion knowledge.

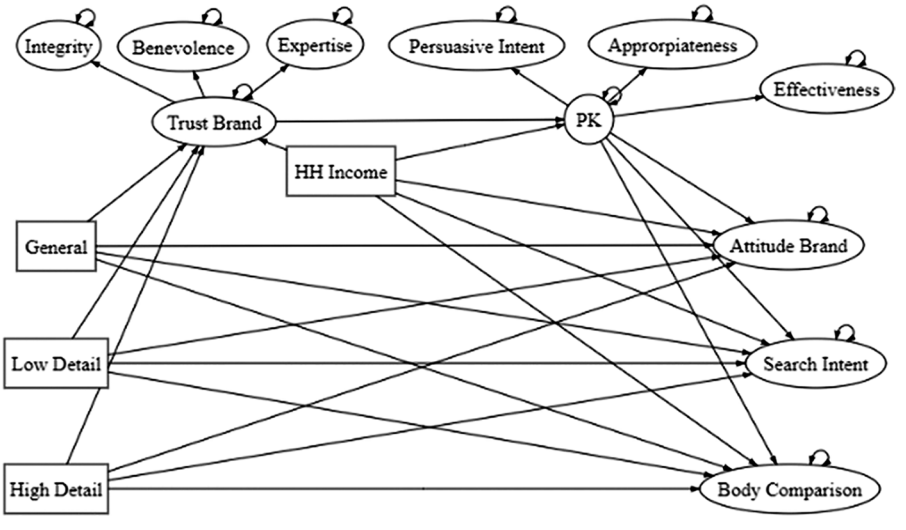

Figure 3. Path model 2.
Note: Path model 2 assesses disclosure specificity effects on consumer attitudes toward the brand, search intent, and body comparison via trust in the brand and persuasion knowledge.

= 2183.69, $p < .001$; CFI = .96; RMSEA = .04, 90% confidence interval [CI] [.04, <.05], p-close = 1, SRMR = .06.

Hypotheses testing

H1 & H2: Disclosure specificity effects on consumer responses

The model showed that more specific disclosures affected trust. Specifically, low-detail disclosures ($b = -0.35$, $p < .001$), but not high-detail disclosures ($b = -0.20$, $p = .05$) or general disclosures ($b = -0.05$, $p = .66$), significantly decreased trust in the content

creator. Additionally, low-detail disclosures ($b = -0.44$, $p < .001$) and high-detail disclosures ($b = -0.32$, $p = .02$), but not general disclosures ($b = -0.16$, $p = .23$), significantly decreased trust in the brand. However, disclosure specificities did not significantly differ from each other in their effects on consumer trust on the content creator and brand (all $p > .05$). H1a was, therefore, supported, while H1b was not supported.

General, low-detail, and high-detail disclosure messages, however, did not significantly influence consumers' brand attitude ($b = .03$, $p = .70$; $b = .06$, $p = .46$; $b = -0.09$, $p = .27$), search intent ($b = .16$, $p = .10$; $b = .00$, $p < 1$; $b = .09$, $p = .33$), or body comparison ($b = .26$, $p = .18$; $b = .13$, $p = .51$; $b = .24$, $p = .21$). Thus, H2 was not supported.

H3: The relationship between trust and persuasion knowledge. Trust in the content creator and the brand, on the other hand, both significantly affected consumers' persuasion knowledge ($b = .85$, $p < .001$; $b = .59$, $p < .001$). H3 was, therefore, supported.

H4: Serial mediation analysis. As the model shows no significant main effects of disclosure specificity on consumer responses of attitude toward the content creator and brand, search intent, and body comparison, mediation analyses did not find full mediation. However, indirect disclosure effects were identified.

As outlined in previous hypotheses testing, different disclosure specificities exhibited decreased consumer trust (H1), while lower trust was associated with less favorable activation of persuasion knowledge (H3). In testing for H4a, b, and c, respectively, persuasion knowledge was shown to influence consumer attitudes toward the influencer ($b = .93$, $p < .001$) and brand ($b = 1.19$, $p < .001$), search intent ($b = .88$, $p < .001$), and body comparison ($b = .58$, $p < .001$).

Both low- and high-detail disclosures, but not general disclosures, led to less favorable attitude toward the content creator (general: $b = -0.04$, $p = .63$; low-detail: $b = -0.28$, $p < .01$; high-detail: $b = -0.16$, $p = .04$) and search intent (general: $b = -0.04$, $p = .62$; low-detail: $b = -0.25$, $p < .01$; high-detail: $b = -0.15$, $p = .04$), but also lower body comparison (general: $b = -0.02$, $p = .60$; low-detail: $b = -0.17$, $p < .01$; high-detail: $b = -0.10$, $p = .02$), *via* consumers' trust in the content creator and, subsequently, their persuasion knowledge.

Additionally, low- and high-detail disclosures, but not general disclosures, effected less favorable attitude toward the brand (general: $b = -0.11$, $p = .24$; low-detail: $b = -0.31$, $p < .01$; high-detail: $b = -0.23$, $p < .01$), as well as lower search intent (general: $b = -0.08$, $p = .24$; low-detail: $b = -0.23$, $p < .01$; high-detail: $b = -0.17$, $p < .01$) and body comparison (general: $b = -0.06$, $p = 24$; low-detail: $b = -0.15$, $p < .01$; high-detail: $b = -0.11$, $p < .01$), *via* consumers' trust in the brand and persuasion knowledge. The effects of low- and high-detail disclosures on trust in the content creator and brand were not significantly different from each other ($p > .05$). Overall, results found support for H4.

Discussion

The present study examined the effects of image retouching disclosure specificity on various consumer responses, including cue-based trust formation, persuasion knowledge, attitudes and behavior, and body comparison, with effects on consumer attitudes, behavior, and body comparison taking place *via* mechanisms of trust and,

subsequently, persuasion knowledge. To explore these relationships, an online experiment was conducted.

Discussion of findings

Initially, the study's findings of disclosure effects appear consistent with existing research on image manipulation disclosure effects (Schirmer et al. 2018) in its finding that disclosures do not exert direct effects on consumers' attitudinal and behavioral responses. However, indirect disclosure effects identified in this study provide additional insight and context into how image manipulation disclosures may affect consumers and the psychological mechanisms of such effects. Specifically, the present study showed that particularly low- and high-detail disclosures, i.e. disclosures that provide additional detail about how content was manipulated, serve as cues that reduce consumers' trust levels in the brand, while high-detail disclosures did not significantly reduce trust in the brand. While the direct effect of high-detail disclosures on trust were not significant, mediation analysis still identified a significant indirect effect of low- and high-detail disclosures on consumers attitudes toward the content creator and brand, search intent, and body comparison. Specifically, the reduction of trust leads consumers to use their persuasion knowledge when processing the content and, in turn, effects less favorable consumer attitudes toward the brand and content creator, a decreased likelihood to search for more information about a featured brand, and reduced body comparison with the influencer depicted in the content. These findings hold both theoretical as well as practical implications for various stakeholders.

Theoretical implications

The potentially harmful effects of exposure to idealized depictions of bodies (e.g. Tiggemann and Zaccardo 2015; Brown and Tiggemann 2016, 2020; Dignard and Jarry 2021; Panjrath and Tiwari 2021; Prichard, Taylor, and Tiggemann 2023) highlight the importance of research examining strategies to mitigate such effects. The present study's insights shed light on the workings and effectiveness of image retouching disclosures, building understanding of such disclosures as tools to mitigate unfavorable effects of image manipulation. Consistent with previous research on image manipulation disclosures (e.g. Schirmer et al. 2018; Naderer, Peter, and Karsay 2022), no direct effects of disclosure presence and specificity were identified. However, this research found indirect effects of low- and high-detail disclosures on consumer responses that illustrate the importance of understanding the mechanisms of disclosure effects. The indirect effects of disclosure specificity on consumers attitudinal, behavioral, and body comparison responses *via* consumer trust and persuasion knowledge suggest that image manipulation disclosure messages exert some effect on consumer responses. This insight may prompt researchers to explore other disclosure message designs to understand the potential of disclosure messages. This understanding is imperative in the context of informing consumers of image manipulation and mitigating potentially harmful effects of image manipulation as well as helping brands navigate a future in

which image manipulation in sponsored content may be regulated by policy requiring disclosures of any image manipulation.

The study, furthermore, contributes to our understanding of Signaling Theory (Spence 1973), as it applies this theory in an eWOM context rather than a traditional buyer-seller relationship and in the context of cue-based trust. The findings that signals may also be of a negative valence and may interfere with positive message contributes to the body of literature on signaling theory that has primarily focused on positive signals (Connelly et al. 2011) and supports a more expansive conceptualization of signals and contributes. Signaling, thus, is not only a tool for sellers to reduce information asymmetry and improve the buyer-seller relationship, but also a challenge to them, as negative signals may interfere with an intentional positive signal.

The study builds on our conceptual understanding of trust by examining it as a cue-based construct rather than an experiential one based on cumulative experiences. While trust is frequently defined as an experiential construct (Wang 2001), many contexts, particularly online (Pfeuffer and Huh 2020), do not allow for this type of trust formation, in which circumstance consumers would likely rely on visual cues, like disclosures, for their initial trust formation and engagement with the content. The present study relies on this conceptualization of trust for its research design, showing that cumulative experiences are not required to build trust. Rather, in the absence of opportunity to rely on cumulative experience, consumers may rely on observed signals to build cue-based trust.

Finally, the study contributes to PKM literature by examining various PK subdimensions in a single study and discussing their relationship with trust. While research that conceptualized trust as experiential (e.g. Boerman et al. 2018) usually contends that the activation of PK influences trust, the present study's findings support that an initial level of trust, at least based on cues, is necessary for consumers to even engage with the content. Consistent with previous literature employing an operationalization of an initial level of trust (e.g. Chen and Cheng 2020; von Sikorski 2022), this study showed that this initial trust level consequently determines consumers' application of persuasion knowledge to process the message and derive their attitudinal and behavioral responses.

Practical implications

The findings of our study would be of value to regulators, social media platforms, brands, and content creators. The insights may provide guidance to regulators and social media platforms in developing guidelines on how image retouching disclosure should take place. Practically, there are two main reasons why the disclosure of image retouching is important: consumer protection and brand protection. Our findings can shed light on protecting both consumers and brands in the realm of social media influencer advertising using digitally altered images.

First, the disclosure may help reduce potentially harmful effects of unrealistic beauty standards on mental health of consumers and society. In turn, the practice can protect the media platforms by preventing them from potential legal challenges germinated from making revenues from ads featuring deceitful images. As introduced previously, countries such as Norway and France have passed laws to

control manipulated images to protect consumers, especially young people. However, the amended Marketing Control Act in Norway, for example, does not cover all possible alterations of images. Norway's label requirements are limited to advertisements that include images of people whose body size, body shape, or skin have been altered. Therefore, changing hair or retouching a bruise, for instance, may not be regulated by the current regulation (Chiu 2021). Our findings that low- and high-detail disclosures have significant indirect effects through consumer trust and persuasion knowledge suggest that regulations can be effective when requiring more detailed disclosures. On the other hand, there is a study demonstrating that a vague label (e.g. the general disclosure in the present study) can cause people to engage more with the altered image because it can increase the attention to the image (Engeln 2018). Our study did not find any support for such a claim.

Second, image manipulation disclosures will help brands and influencers be perceived as more trustworthy. From the Signaling Theory perspective, an influencer can be a useful source to signal the benefits and quality of a brand when consumers are uncertain about the brand. As this asymmetrical information structure of the market is typical in most marketing situations, firms are advised to ensure that their use of influencers is credible. Our study provides evidence that the presence of an image retouching disclosure and its specificity in the influencer post can be critical factors to suitably signal the quality of a brand credibly in terms of integrity and benevolence, which then positively affects the subsequent consumer outcomes. Brands and content creators may use these insights to adapt image retouching and disclosure practices to mitigate potential negative effects on consumers and brand image.

Limitations and future research

The most notable study limitation includes issues of external and ecological validity. Participants were randomly assigned to an influencer advertising a skin care product. This random assignment did not mimic how social media users are targeted and exposed to social media posts. Thus, participants may have been shown an influencer or product that is not highly relevant to them. The study aimed to account for potential effects of perceived similarity to the influencer shown in the post by including both a male and a female influencer; however, the perception of similarity is more intricate than can be accounted for by a binary manipulation of the apparent gender of an influencer and would likely include many factors.

Furthermore, the present study aimed to control for preconceived notions of brands and content creators by including fictitious brands and influencers. While this approach aids in manipulation of relevant study concepts and consumer responses, it is unable to account for the role of established relationships and trust with existing brands and content creators that may also shape consumer responses.

As a result of these limitations, care should be taken when applying study findings to different social media contexts. To address these limitations, future research may aim to examine image retouching disclosure effects using different contexts and multi-method research. Researchers are also encouraged to explore various disclosure message designs

and the role of perceived similarity between influencers and consumers in image retouching disclosure effects, such as other genders or race and ethnicity.

Disclosure statement

No potential conflict of interest was reported by the authors.

This study was approved by the University of Georgia's Institutional Review Board (approval no. 5478).

Data availability statement

Data available on request from the authors.

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