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They Shouldn't Be Richer Than Me: How Visual Wealth Exposure on Social Media Increases Relative Deprivation

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Abstract

While some research suggests social media use increases individuals' relative deprivation, others do not observe a significant prediction effect. We proposed that specific activities on social media may account for the generation of relative deprivation. Given that, three studies were conducted to examine how visual wealth exposure, a common phenomenon on social media, increased individuals' relative deprivation, and the subsequent downstream consequences. By conducting an online survey, Study 1 found a significantly positive relationship between visual wealth exposure on social media and relative deprivation, and upward social comparison played a mediating role between them. By conducting an online experiment, Study 2 found that participants in the wealth image exposure condition perceived higher relative deprivation than participants in the natural scenery image exposure condition, and upward social comparison played a mediating role between exposure condition and relative deprivation. The following Study 3 found that visual wealth exposure increased participants' hostility toward the rich via the mediating role of relative deprivation. Moreover, hostility toward the rich further provoked aggressive behaviors. That is, visual wealth exposure increased participants' aggressive behaviors via the chain-mediating role of relative deprivation and hostility toward the rich. The present research deepens our understanding of how social media use increases individuals' relative deprivation and social class antagonism, and also carries implications for how authorities could alleviate the increasing conflicts between the poor and the rich in China-Mainland.

Keywords: social media; visual wealth exposure; income inequality; social comparison; relative deprivation; social stratification

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Introduction

Social media has become a necessary part of our daily lives. Prior literature suggests some controversies about whether social media use increases individuals' relative deprivation (Cho, 2014; Gkinopoulos et al., 2023; Lilly et al., 2023; H. J. Park & Park, 2024). For example, when examining the relationship between social networking service (SNS) use and loneliness via a questionnaire survey, H. J. Park and Park (2024) found that there was a

significantly positive correlation between SNS use and relative deprivation. However, in a five-year longitudinal research, Lilly et al. (2023) found that when adjusting for stable between-person differences, within-person changes in social media use can't significantly predict changes in personal deprivation over time. To solve this issue, we proposed that specific activities on social media may account for the generation of relative deprivation. Specifically, the present research firstly examined how visual wealth exposure on social media, a common phenomenon in daily life, would increase individuals' relative deprivation, and the mediating role of upward social comparison behind the phenomenon. Based on this, the research further examined the downstream consequences linked to relative deprivation—whether the relative deprivation induced by visual wealth would increase hostility and aggressive behaviors toward the rich. In theory, by investigating the relationship and mechanism between visual wealth exposure on social media and relative deprivation, the present research provided a novel insight into how social media use contributed to relative deprivation. In practice, with the widening gap between the poor and the rich in Chinese society, resentment toward the rich has become more salient in recent years (X. Wu & Lin, 2020; Zhou, 2009). In this social context, the present research attempted to examine how visual wealth exposure increased hostility toward the rich from the perspective of relative deprivation, which carried implications for how authorities alleviated the increasing conflicts between the poor and the rich in China-Mainland.

Social Media Use

Today, social media is prevalent across the world, especially those picture/video-based platforms, such as Facebook, Instagram, TikTok, and so on. Through social media, individuals can not only get the latest news of hot events but also can communicate with friends beyond the time-and-space restriction, thus readily perceiving social support and belongingness (Carr et al., 2016; Ellison et al., 2007; O'Keeffe & Clarke-Pearson, 2011). Meanwhile, researchers reveal various negative consequences linked to social media use (Amedie, 2015; Krause et al., 2019; O'Day & Heimberg, 2021). For example, excessive social media use leads to negative emotional experiences and self-evaluations, such as "Facebook Depression" (Steers, et al., 2014). By using beauty filters, some social media influencers display unrealistically ideal bodies, which imposes a threat to the body self-esteem of women (Robinson et al., 2017). To achieve the so-called ideal bodies, some women may experience eating disorders, invest in cosmetic surgery regardless of costs, or engage in excessive exercises oriented toward enhancing physical appearance (Wang et al., 2021; Yellowlees et al., 2019). In some cases, social media platforms provide an ideal environment for the copycat crime of adolescents (Amedie, 2015). Given a series of negative consequences linked to social media use, researchers show great interest in elucidating when and how social media use produces negative influences on individuals' mental health.

Visual Wealth Exposure on Social Media and Relative Deprivation

Compared to traditional media, user-based generation can be defined as a typical characteristic of social media—all users can create unique content and share it with others on the platform (Ellison & Boyd, 2013). In this sense, social media makes individuals compare with others more readily and frequently. According to social comparison theory, social comparison can be divided into upward social comparison (comparing the self with someone better-off) and downward social comparison (comparing the self with someone better-worse; Festinger, 1954). Prior literature suggests that, compared to downward social comparison, upward social comparison is more likely to induce individuals' negative emotions and self-evaluations, such as envy, lower well-being, depressive symptoms, and lower self-esteem (Charoensukmongkol, 2018; Feinstein et al., 2013; Schmuck et al., 2019).

Notably, due to the positive self-presentation on social media, social media users in most cases experience upward social comparison rather than downward social comparison (H. J. Park & Park, 2024). Specifically, self-presentation and self-disclosure processes are important aspects of relational development in offline settings (Taylor & Altman, 1987). According to Goffman's (1959) impression management theory, individuals may actively engage in strategic activities in social interactions to increase their attractiveness to a preferred target audience. As a consequence, most individuals tend to emphasize positive aspects of the self when engaging in self-disclosure behaviors in both

offline and online settings (Ellison et al., 2006; Gadgil et al., 2021). However, compared to offline settings, online settings allow individuals to present their “ideal self” in a more selective and controlled way (Ozimek & Förster, 2021). For example, when women share their selfies on social media, they often use beauty filters to enhance their appearance attractiveness (Chang et al., 2019). Even when they allege that they engage in fitness activities for a health purpose, they are still likely to deliberately select some so-called ideal body images and push them on social media (Raggatt et al., 2018).

In addition to selfies and fitness widely documented in previous research, it is common for individuals to share wealthy symbols on social media. Wealthy symbols refer to some items that can manifest an individual’s wealth or social status, such as villas, luxuries, mountains of cash, and so on (Luo & Yang, 2024). When such wealthy symbols are visually displayed on social media, we call them visual wealth. Surprisingly, despite the fact that exposure to visual wealth on social media is a common phenomenon in daily life, the existing research pays little attention to how this phenomenon affects individuals’ mental health. When exposed to visual wealth on social media, individuals may perceive that others on the platform are richer than themselves, thus experiencing upward social comparison. Moreover, those individuals actively interacting with each other on social media are often similar in several attribute or evaluation dimensions (e.g., age, hobby, disposition, or specialty; Rozzell et al., 2014). According to social comparison theory, in a given evaluation dimension, individuals tend to believe that they can do as well as those similar reference targets—the so-called assimilation effect (Festinger, 1954; Suls et al., 2002). So, when individuals perceive that those similar reference targets on social media are generally richer than themselves, they can experience relative deprivation—feelings of anger and resentment stemming from the perception that one or one’s group is deprived of a deserved outcome (Crosby, 1976). In simple words, upward social comparison and perceived unfairness are essential for generating relative deprivation (Smith et al., 2012). Additionally, empirical research also indicates that upward social comparison contributes to generating relative deprivation (Kim et al., 2017, 2018; H. J. Park & Park, 2024). For example, by asking participants to think of one individual with whom they usually compare themselves in terms of their financial circumstances, Kim et al. (2018) found that upward social comparison (perceiving a reference target as better off financially) was significantly associated with greater relative deprivation (Study 1). Based on the above reasoning, we proposed the following two hypotheses:

H1: Greater exposure to visual wealth on social media leads to greater relative deprivation.

H2: Upward social comparison fully explains the relationship between visual wealth exposure and relative deprivation.

Visual Wealth Exposure, Relative Deprivation, and Hostility Toward the Rich

Relative deprivation can lead to various negative consequences on the individual and societal levels, including lower self-esteem (Walker, 1999), lower subjective well-being (Ellaway et al., 2004), poorer physical health (Osborne et al., 2012), increased psychological distress (Osborne & Sibley, 2013), increased aggression and crime rates (Greitemeyer & Sagioglou, 2017), and lower prosociality (Callan et al., 2017). Beyond previous research, the present research first explored whether the relative deprivation induced by visual wealth exposure on social media would increase users’ hostility to the rich. According to the postulations of the stereotype content model, stereotype content can be clustered into two basic dimensions—warmth and competence. The warmth dimension refers to how benign and likable members of a given group are perceived, and reflects one’s evaluation of the intentions of the target person/group (Fiske et al., 2007; Pröbster & Marsden, 2023). The competence dimension reflects one’s evaluation of how effectively the person/group can pursue those intentions (Pröbster & Marsden, 2023). People often hold complementary stereotypes for members of a given group in both dimensions (Fiske et al., 2002). For instance, empirical research reveals that advantaged groups tend to be perceived as competent but cold while disadvantaged groups tend to be perceived as less competent but warm (Durante et al., 2013). These complementary stereotypes for advantaged groups partially explain why individuals in both Eastern and Western societies commonly display explicit resentment toward the rich (Horwitz & Dovidio, 2015; S. J. Wu et al., 2018).

Although resentment toward the rich is pervasive around the world (Firth et al., 2014; Piston, 2014; X. Wu & Lin, 2020), we proposed that acute exposure to visual wealth would make individuals strongly perceive their disadvantages relative to the rich, thus increasing their relative deprivation. So far, several studies have indicated the feasibility of this proposition (Chipp et al., 2011; Shrum et al., 2022; Zhang & Zhang, 2016). By adopting face-to-face interviews, Chipp et al. (2011) revealed that there was a significant correlation between relative deprivation and conspicuous consumption among South Africans. In another study conducted in China (Zhang & Zhang, 2016, Study 2), researchers found that exposing undergraduate students to pictures of luxurious goods, a specific form of visual wealth exposure, caused them to experience greater personal relative deprivation than those exposed to pictures of neutral scenes. In this case, individuals may identify the rich as the source of their relative deprivation, thus further elevating their hostility to the rich. In line with our proposition, H. J. Park and Park (2024) recently argued that when people felt deprived, they tended to attribute criticisms and responsibility to powerful or advantaged groups in society. Empirical research by Greitemeyer and Sagioglou (2017) provided stronger support for our hypothesis. Specifically, researchers manipulated participants' relative deprivation by the Comparative Discretionary Income (CDI) index program, then intentionally made partial participants know who had (not) calculated the CDI index. The results showed that, in the relative deprivation condition, participants displayed more hostility toward the target person when he was identified as the source of relative deprivation than when he was identified as irrelevant for relative deprivation. Following our reasoning, we can propose the third and fourth hypotheses:

H3: Visual wealth exposure increases individuals' hostility toward the rich.

H4: Relative deprivation fully explains the relationship between visual wealth exposure and individual's hostility toward the rich.

People often hold complex beliefs about the rich. For instance, they can give negative evaluations of the rich on the explicit level but show affiliation motivations toward the rich on the implicit level (Horwitz & Dovidio, 2015). Given that, we also examined whether hostility toward the rich drove individuals to display aggressive behaviors toward the rich in the present research. Considering that aggressive affect served as the proximal determinant and evoked aggressive behaviors in individuals (Greitemeyer & Sagioglou, 2017), we expected that hostility toward the rich would motivate individuals to display aggressive behaviors toward the rich. That is,

H5: Visual wealth exposure increases aggressive behaviors toward the rich via the chain-mediating role of relative deprivation and hostility to the rich.

The Present Research

Taken together, the present research aimed to investigate how visual wealth exposure on social media increased individuals' relative deprivation, and the downstream consequences linked to relative deprivation. To this end, we conducted three studies. In Study 1, we conducted a questionnaire survey to examine the relationship between visual wealth exposure and relative deprivation, and the underlying mechanism, which would provide correlational evidence for H1 and H2. In Study 2, we conducted an online experiment to conceptually replicate the findings of Study 1, which would provide causal evidence for H1 and H2. In Study 3, we conducted an online experiment to examine how visual wealth exposure increased participants' hostility toward the rich via the mediating role of relative deprivation, which would provide evidence for H3 and H4. In Study 3, we also examined whether visual wealth exposure increased aggressive behaviors toward the rich via the chain-mediating role of relative deprivation and hostility toward the rich, which would provide evidence for H5. Databases in the present research were uploaded on OSF (<https://osf.io/vyzpa>). All scales in the present research were uploaded on OSF (<https://osf.io/w8bcg>). Data exclusion was done prior to conducting any statistical analyses.

Study 1

Study 1 was an online questionnaire survey, whose primary goal was to provide preliminary evidence for H1 and H2.

Methods

Participants

We determined the sample size of Study 1 by using the G*power 3.1 (Faul et al., 2009). A presupposed regression equation with $\beta = .20$, 80% statistical power, and the .05 level significance required at least 150 participants. So, we finally used a convenient sampling method to recruit 160 participants via the Credamo platform (www.credamo.com). Those participants failing to pass the attention check were automatically dropped from the survey. Three participants were dropped from any analyses because they indicated the same answers for all items. As a result, 157 participants were included in the final data analysis (100 females, 57 males, $M_{\text{age}} = 30.41$ years old, $SD = 7.21$, ranging from 17.67 to 56.00 years old). Of them, 152 participants were Han nationality, and the others were national minorities (2 Hui, 2 Zhuang, and 1 Buyi).

Measures

Visual Wealth Exposure on Social Media. Following previous research (Yang et al., 2023), we presented seven types of social media activities for participants, which can be identified as visual wealth or wealth symbols. These activities include: 1) *showing a lot of money*, 2) *taking photos with a luxury car or yacht*, 3) *dining or staying at a luxury hotel/villa*, 4) *showing brand-name cosmetics*, 5) *showing designer clothes, shoes or bags*, 6) *showing valuable electronics or watches*, and 7) *sharing the experiences of traveling abroad*. For each activity, participants needed to report how often they were exposed to such activities on the 7-point scale (1 = *never*, 7 = *always*). The frequency of visual wealth exposure was assessed by summing the score on each item, with higher values indicating greater exposure frequency. The Cronbach's alpha coefficient of the scale was $\alpha = .90$.

Upward Social Comparison. Following previous research (Schmuck et al., 2019), the upward social comparison scale developed by Lee (2014) was used in the present research. The scale includes three items, which assess whether individuals engage in upward social comparison when using social media. An example item was *I often think that others have a happier life, when I read their news feed or see their photos*. For each item, participants needed to give their agreement on the 5-point scale (1 = *strongly disagree*, 5 = *strongly agree*). The score of upward social comparison was calculated by averaging the scores on all items, with higher scores indicating greater upward social comparison. The Cronbach's alpha coefficient of the scale was $\alpha = .70$.

Relative Deprivation. Participants' relative deprivation was assessed via the relative deprivation scale by Callan et al. (2011). The scale included 5 items (e.g., *I feel deprived when I think about what I have compared to what other people like me have*), and participants needed to indicate to what extent they agreed with each item on the 7-point scale (1 = *strongly disagree*, 7 = *strongly agree*). The score of relative deprivation was calculated by averaging the scores on all items, with higher scores indicating greater relative deprivation. The Cronbach's alpha coefficient of the scale was $\alpha = .73$.

Demographic Information. In addition to the above key variables, necessary demographic information was also collected, including age, nationality, monthly income, education background, and subjective socioeconomic status (SSES). Education background and monthly income were combined and averaged to represent the objective socioeconomic status of participants (OSES). SSES was assessed by asking participants to mark one of 10 rungs on a ladder to indicate their social class rank in society (Kraus et al., 2009).

Procedure

We recruited participants via the Credamo platform. When we posted a recruitment message, the platform would push the message to eligible users via WeChat. When participants clicked on the questionnaire link, a brief introduction for the purpose of the survey was presented to them. If they were willing to go on the survey, they needed to sign the electronic version of informed consent. Then, they successively completed each part of the questionnaire. When they completed the whole survey, they would receive 2 RMB (approximately 0.3 dollars).

Results

Descriptive Results

The questionnaire could be successfully submitted only if all items were completed. So, no missing value was generated in Study 1. Correlations among variables were presented in Table 1. As shown in the table, three key variables were significantly and positively correlated with each other, $ps < .05$. In addition, SSES was significantly and negatively correlated with relative deprivation, $ps < .05$, and SSES was significantly and positively correlated with OSES, $p < .01$.

Table 1. Means, Standard Deviations, and Correlations Among Variables in Study 1 ($n = 157$).

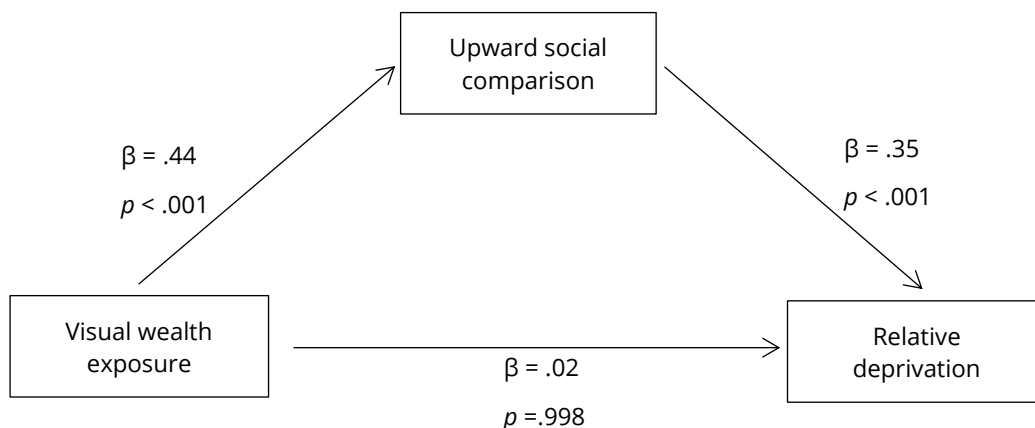
	<i>M</i>	<i>SD</i>	Visual wealth exposure	Upward social comparison	Relative deprivation	OSES	SSES	Age
Visual wealth exposure	35.83	8.37	—					
Upward social comparison	3.80	0.72	.38**	—				
Relative deprivation	3.96	1.12	.17*	.36**	—			
OSES	4.83	0.96	-.05	-.01	.09	—		
SSES	5.21	1.50	-.05	.03	-.28**	.38**	—	
Age	30.41	7.21	.04	-.21**	-.19*	.03	.17*	—

Note. * $p < .05$, ** $p < .01$. *M* = means, *SD* = standard deviations, OSES = objective socioeconomic status, SSES = subjective socioeconomic status.

The Relationship and Mechanism Between Visual Wealth Exposure and Relative Deprivation

To test H1, after controlling for age, gender (0 = female, 1 = male), SSES, and OSES, we conducted a linear regression equation in which standardized relative deprivation was regressed onto standardized visual wealth exposure. The overall regression model was significant, $F(5, 156) = 6.34$, $R^2 = .17$, $p < .001$. The results showed a significant prediction coefficient of visual wealth exposure on relative deprivation, $\beta = .16$, $p = .03$, thus supporting H1. Then, the Macro Process (model 4, bootstrapping 10000 times) developed by Hayes (2013) was used to examine the mediating role of upward social comparison between visual wealth exposure and relative deprivation. The results showed that the overall mediation model was significant, $F(6, 150) = 9.42$, $R^2 = .27$, $p < .001$, and 95% confidence interval of the indirect effect was significant did not contain zero, $f = .15$, 95% CI [.07, .25], thus supporting H2. When taking the indirect effect into account, the direct effect between visual wealth exposure and relative deprivation was not significant, $f = .02$, 95% CI [-.14, .19]. Specific coefficients were presented in Figure 1.

Figure 1. The Mediation of Upward Social Comparison Between Visual Wealth Exposure and Relative Deprivation in Study 1.



Note. For a clean presentation, control variables were not presented. Standardized coefficients were reported.

Discussion

In Study 1, we found that participants with frequent exposure to visual wealth on social media tended to report greater relative deprivation, and upward social comparison played a mediating role between visual wealth exposure and relative deprivation. Thus, Study 1 provided preliminary evidence for H1 and H2. However, considering that Study 1 in nature was a correlational design, we can't draw causal inferences among variables. Given that, we sought to conduct an online experiment to provide more convincing evidence for H1 and H2.

Study 2

Study 2 was an online experiment. Following previous research (Tiggemann & Zaccardo, 2015; Luo & Yang, 2024), we randomly assigned participants to the wealth-relevant image exposure condition (experimental condition) or the natural scenery image exposure condition (control condition). Then, participants reported their upward social comparison and relative deprivation. Our major concerns were whether any differences existed in relative deprivation between the two conditions, and whether upward social comparison played a mediating role between exposure condition and relative deprivation.

Methods

Participants

As in Study 1, we determined the sample size of Study 2 by using the G*power 3.1 (Faul et al., 2009). For an independent-samples *t*-test, a presupposed 0.5 effect size, 80% statistical power, and the .05 level significance approximately required 102 participants. Considering that we would conduct a mediation analysis in Study 2, we finally determined the same sample size as in Study 1 (150 participants). By using a convenient sampling method, we recruited such participants via the Credamo platform. No participant was dropped due to invalid responses. So, all 150 participants were included in the final data analysis (96 females, 54 males, $M_{age} = 31.80$ years old, $SD = 8.62$, ranging from 19.50 to 60.50 years old). Among them, 143 participants were Han nationality, and the others were national minority (2 Hui, 4 Man, and 1 Yi).

Stimuli and Measures

Exposure Condition Manipulation. Following previous research (Luo & Yang, 2024), we randomly assigned participants to the wealth-relevant image or the natural scenery image exposure condition. In the former, we presented 20 wealth-relevant images and 4 natural scenery images for participants. The four natural scenery images were presented in a pseudo-random order to avoid participants suspecting our research purpose. In the latter, we presented 24 natural scenery images for participants. The perceived quality of the images between two conditions were matched, and specific data analyses were provided in supplementary materials.

By using photo-editing software, each selected image was embedded in the framework of WeChat Moments (See Figure 2). So, we ostensibly presented some screenshots of WeChat Moments, which were declared to come from kindly anonymous users. To control for possible confounding factors, each screenshot was pixelated. Participants were asked to give their ratings for the composition and innovation of each image. All images were presented for participants in a random order. Example images can be found in Figure 2 and we uploaded all images on OSF (<https://osf.io/x57zf>).

Figure 2. Example Images in the Wealth Image Exposure Condition (Left) and the Natural Scenery Image Exposure Condition (Right) of Study 2.



Upward Social Comparison. Following Vogel et al. (2014), we measured participants' upward social comparison by explicitly asking *when comparing yourself to others on social media, to what extent do you focus on people who are better off than you*. Participants needed to give their answer on the 5-point scale (1 = *never*, 5 = *always*), with a higher value indicating greater upward social comparison.

Relative Deprivation. Following previous research (Zhang & Zhang, 2016), we assessed participants' relative deprivation by explicitly asking *to what extent do you agree that you have got what you deserve compared to others*. Participants needed to give their answers on the 6-point scale (0 = *strongly disagree*, 5 = *strongly agree*). The score of relative deprivation was calculated by subtracting the answer from 6, with higher scores indicating greater relative deprivation.

Demographic Information. In Study 2, we collected participants' age, nationality, monthly income, education background, and SSES. Education background and monthly income were combined and averaged to represent OSES.

Procedure

Study 2 was conducted on the Credamo platform. As in Study 1, participants assigned the informed consent prior to the formal task. Then, they completed a so-called image-rating task (exposure condition manipulation), in which they were asked to give their ratings for the composition and innovation of each image. They were explicitly told that all images were selected from the screenshots of volunteers' WeChat Moments. After the image-rating task, they successively reported the other parts of the questionnaire. After completing all tasks, participants were rewarded 3RMB (approximately 0.4 dollars) for their participation.

Results

Manipulation Effectiveness Check

Following the exposure condition manipulation, an item *to what extent you feel that the evaluated screenshots of WeChat Moments show off their wealth* was used to assess the effectiveness of exposure condition manipulation. An independent-samples *t*-test showed that participants in the wealth image exposure condition reported more feelings of exposure to flaunting wealth than participants in the natural scenery image exposure condition, $t(148) = 8.47, p < .001, d = 1.38$, indicating the effectiveness of wealth exposure manipulation.

Comparisons for Upward Social Comparison and Relative Deprivation Between Two Conditions

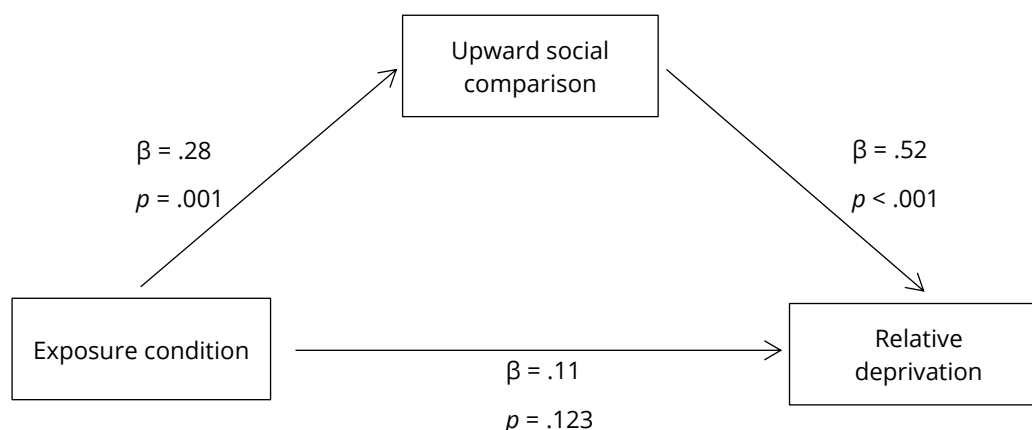
Preliminary analysis did not reveal any significant effects relevant to gender, so this variable was not included in the following analysis. An independent-samples *t*-test showed that participants perceived greater upward social comparison in the wealth image exposure condition than in the natural scenery image exposure condition, $t(148) = 3.32, p = .001, d = 0.54$. Another independent-samples *t*-test showed that participants in the wealth image

exposure condition perceived greater relative deprivation than those in the natural scenery image exposure condition, $t(148) = 3.12, p = .002, d = 0.51$, thus providing causal evidence for H1 that visual wealth exposure on social media increased participants' relative deprivation.

The Mediating Role of Upward Social Comparison

After exposure condition was coded as a dummy variable (*wealth image exposure* = 1, *natural scenery image exposure* = 0), the Macro Process (model 4, bootstrapping 10000 times) developed by Hayes (2013) was used to examine the mediating role of upward social comparison between exposure condition and relative deprivation. Consistent with Study 1, the overall mediation model was significant, $F(6, 143) = 11.28, R^2 = .32, p < .001$, and 95% confidence interval of the indirect effect of upward social comparison did not contain zero, $f = .15, 95\% \text{ CI } [.06, .26]$, thus providing causal evidence for H2. By contrast, the direct effect between exposure condition and relative deprivation was not significant, $f = .11, 95\% \text{ CI } [-.03, .26]$. Specific coefficients were provided in Figure 3.

Figure 3. *The Mediation of Upward Social Comparison Between Exposure Condition and Relative Deprivation in Study 2.*



Note. Exposure condition was a dummy variable (0 = *natural scenery image exposure*, 1 = *wealth image exposure*). For a clean presentation, control variables were not presented. Standardized coefficients were reported.

Discussion

By assigning participants to the wealth image or natural scenery image exposure condition, Study 2 found that participants in the former perceived higher relative deprivation than those in the latter. Moreover, further analysis showed that wealth image exposure increased participants' relative deprivation via the mediating role of upward social comparison. By conducting an online experiment, Study 2 provided more compelling evidence for H1 and H2. In the next Study 3, we would investigate whether the relative deprivation increased participants' hostility and aggressive behaviors toward the rich.

Study 3

Study 3 was an online experiment, in which participants were randomly assigned to the wealth image or natural scenery image condition. Then, participants reported relative deprivation and completed the measurements of hostility and aggressive behaviors toward the rich.

Methods

Participants

Consistent with Study 2, we in Study 3 used a convenient sampling method to recruit 150 participants (104 females, 46 males) via the Credamo platform. No participant was dropped from data analysis due to invalid responses. The average age of participants was 31.56 years old, $SD = 9.61$, with a fluctuation range of 18.50 ~ 62.17 years old. Of them, 145 participants were Han nationality, the others were national minority (1 Bai, 2 Hui, and 2 Man).

Stimuli and Measures

Exposure Condition Manipulation. Exposure condition manipulation was identical to that of Study 2.

Relative Deprivation. Consistent with Study 2, a single item *to what extent do you agree that you have got what you deserve compared to others* was used to assess participants' relative deprivation.

Hostility and Aggressive Behaviors Toward the Rich. We assessed participants' hostility and aggressive behaviors toward the rich by using a similar approach to previous research (Greitemeyer & Sagioglou, 2016, 2017). Specifically, we developed an imaginary scenario where a wealthy man/woman showed off his/her numerous wealth. Then, several items were used to measure participants' hostility and aggressive behaviors toward the rich. The developed vignette was presented in the following.

On a social media platform, a wealthy man/woman displays his/her large deposits. A netizen raises a question about the legitimacy of the wealth, this netizen thus starts an "online petition". The purpose of this petition is to drive authorities to perform a formal investigation toward the wealthy man/woman.

In China, there is virtually no officially sanctioned online petition. In this situation, for most individuals in Chinese society, the so-called "online petition" often means that some netizens spontaneously gather on a social media platform and express their opinions about a hot event on the platform. However, due to the widening income gap and rampant corruption in Chinese society (Tan et al., 2017; X. Wu & Lin, 2020; Zhou, 2009), when the hot event is about a rich man/woman showing off his/her wealth on social media, netizens may feel angry and post negative comments (perhaps rumors) about the person. For the sake of maintaining social stability, the authorities often have to carry out a formal investigation in the numerous wealth. Moreover, in most cases, the rich under pressure will apologize to the public or be punished by the law (if breaking the law). That's why we developed an imaged online petition to assess participants' aggressive behaviors toward the rich.

Following the vignette, three items were used to measure participants' hostility toward the rich: 1) *to what extent you are resentful about the wealth of the rich*, 2) *to what extent you feel that the rich are untrustworthy*, and 3) *to what extent you feel that the wealth of the rich is undeserved*. Another two items were used to measure participants' aggressive behaviors toward the rich: 1) *to what extent you support the online petition in the vignette*, and 2) *to what extent you are willing to participate in this petition*. For each item, participants needed to give their answer on the 7-point scale (1 = *not at all*, 7 = *strongly*), with a higher value indicating stronger agreement or participation willingness. The score of the hostility was calculated by averaging the scores on the three items. Similarly, the score of aggressive behaviors was calculated by averaging the scores on the two items.

Demographic Information. The collected demographic information included age, nationality, monthly income, education background, and SSES.

Procedure

The procedure was identical to that of Study 2, except that participants needed to complete the measurements of hostility and aggressive behaviors following the exposure condition manipulation. For their participation, participants would receive 3 RMB (approximately 0.4 dollars).

Results

Manipulation Effectiveness Check

An independent-samples *t*-test showed that participants in the wealth image exposure condition reported more feelings of exposure to flaunting wealth than participants in the natural scenery image exposure condition, $t(148) = 8.82, p < .001, d = 1.44$, indicating the effectiveness of wealth exposure manipulation.

Comparisons for Key Dependent Variables Between Two Conditions

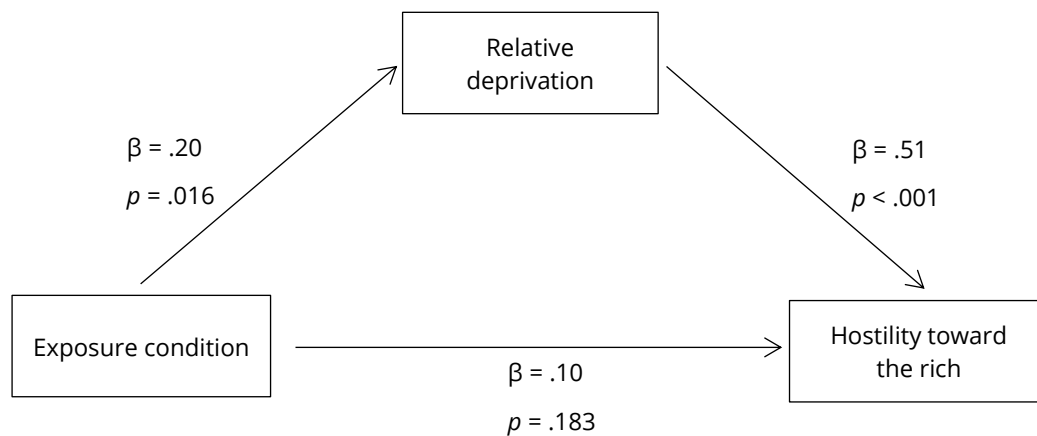
Preliminary analysis did not reveal any significant effects relevant to gender, so this variable was not further considered. Several independent-samples *t*-tests were conducted to examine whether between-groups differences existed in relative deprivation, hostility, and aggressive behaviors. Data analysis showed that

participants in the wealth image exposure condition perceived higher relative deprivation than participants in the natural scenery image exposure condition ($M_{\text{wealth}} = 3.44$, $SD = 0.83$, $M_{\text{scenery}} = 3.08$, $SD = 0.93$), $t(148) = 2.51$, $p = .01$, $d = 0.41$, thus replicating the finding of Study 2. In addition, participants in the wealth image exposure condition also reported greater hostility toward the rich than those in the natural scenery image exposure condition ($M_{\text{wealth}} = 4.18$, $SD = 1.38$, $M_{\text{scenery}} = 3.67$, $SD = 1.26$), $t(148) = 2.39$, $p = .02$, $d = 0.39$, thus providing evidence for H3. However, we can't observe significant between-group differences in aggressive behaviors ($M_{\text{wealth}} = 3.68$, $SD = 1.79$, $M_{\text{scenery}} = 3.49$, $SD = 1.68$), $t(148) = 0.68$, $p = .50$, $d = 0.11$.

The Mediating Role of Relative Deprivation

After exposure condition was coded as a dummy variable (1 = *wealth image exposure*, 0 = *natural scenery image exposure*), the Macro Process (model 4, bootstrapping 10000 times) by Hayes (2013) was used to test the mediating role of relative deprivation between exposure condition and hostilities toward the rich. The results showed that the overall mediation model was significant, $F(6, 142) = 10.68$, $R^2 = .31$, $p < .001$, and the indirect effect between exposure condition and hostilities toward the rich did not contain zero, $f = .10$, 95% CI [.02, .20]. However, when taking the indirect effect into account, the direct effect was not significant, $f = .10$, 95% CI [-.05, .24]. Specific coefficients among variables were presented in Figure 4. The results firstly provided evidence for H4.

Figure 4. The Mediation of Upward Social Comparison Between Exposure Condition and Hostility Toward the Rich in Study 3.



Note. Exposure condition was a dummy variable (0 = *natural scenery image exposure*, 1 = *wealth image exposure*). For a clean presentation, control variables were not presented. Standardized coefficients were reported.

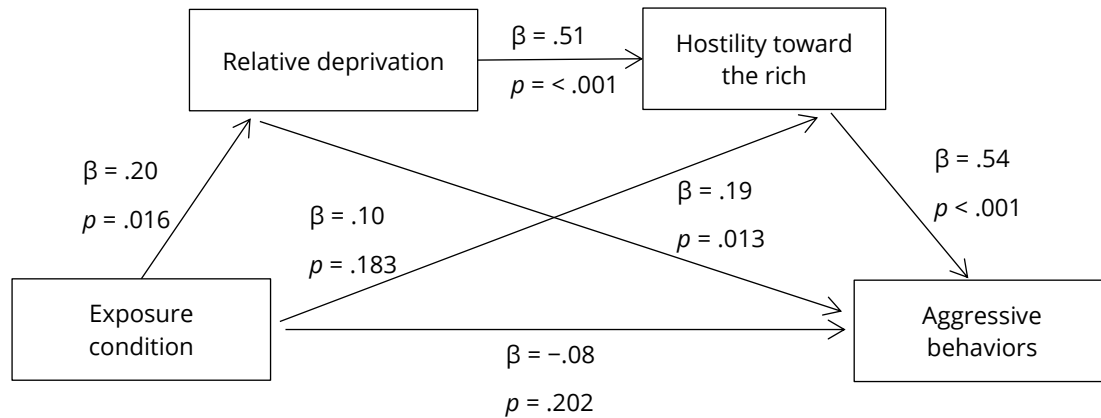
To test whether hostility toward the rich provoked further aggressive behaviors, the Macro Process (model 6, bootstrapping 10000 times) by Hayes (2013) was used to test the chain-mediating role of relative deprivation and hostility between exposure condition and aggressive behaviors. The results showed that the overall mediation model was significant, $F(1, 141) = 17.16$, $R^2 = .46$, $p < .001$. As shown in Table 2, the chain-mediating effect via relative deprivation and hostility was significant, $f = .06$, 95% CI [.01, .13], which provided evidence for H5. An unexpected finding was that the simple-mediating effect via relative deprivation was significant, $f = .04$, 95% CI [.004, .11]. The direct effect between exposure condition and aggressive behaviors was not significant, $f = -.08$, 95% CI [-.21, .04]. Specific coefficients among variables were presented in Figure 5.

Table 2. Direct and Indirect Effects Between Exposure Condition and Aggressive Behaviors Toward the Rich in Study 3.

	Effect	SE	LLCI	ULCI
Direct effect	-.08	.06	-.21	.04
Indirect effect				
Total	.15	.06	.04	.26
Exposure condition → Relative deprivation → Hostilities	.04	.02	.004	.11
Exposure condition → Relative deprivation → Hostilities → Aggressive behaviors	.06	.03	.01	.13
Exposure condition → Hostilities → Aggressive behaviors	.05	.04	-.03	.15

Note. SE = standard error, LLCI = lower limit of confidence interval, ULCI = upper limit of confidence interval.

Figure 5. The Chain-Mediation of Relative Deprivation and Hostilities Toward the Rich Between Exposure Condition and Aggressive Behaviors in Study 3.



Note. Exposure condition was a dummy variable (0 = natural scenery image exposure, 1 = wealth image exposure). For a clean presentation, control variables were not presented. Standardized coefficients were reported.

A Meta-Analysis for Overall Effects Across Three Studies

To estimate the effect reliability of visual wealth exposure on relative deprivation across the three studies, we conducted a meta-analysis in R language. We reported the results of the random effects models here. The results showed that the confidence interval of the effect size of visual wealth exposure on relative deprivation did not contain zero, $d = 0.21$, 95% CI [.11, .30]. By applying this criterion, we found that the effect size of visual wealth exposure on upward social comparison was reliable in the previous two studies, $d = 0.38$, 95% CI [.11, .65], and the effect size of upward social comparison on hostility toward the rich was also reliable, $d = 0.47$, 95% CI [.15, .79]. In sum, the meta-analysis results indicated that the direct and indirect effects of visual wealth exposure on relative deprivation were reliable.

Discussion

In Study 3, we randomly assigned participants to the wealth image or natural scenery image exposure condition, and then assessed participants' relative deprivation, hostility, and aggressive behaviors toward the rich. The results showed that compared to the participants in the natural scenery image exposure condition, participants in the wealth image exposure condition displayed more hostilities toward the rich, thus supporting H3. Importantly, relative deprivation played a mediating role between exposure condition and hostility toward the rich, thus supporting H4. Additional analysis showed that exposure condition did not directly affect participants' aggressive behaviors toward the rich, but visual wealth exposure increased participants' aggressive behaviors toward the rich via the chain-mediating role of relative deprivation and hostility, thus supporting H5. So far, all hypotheses in the present research received support.

In Study 3, we observed an unexpected finding that exposure condition exerted an influence on aggressive behaviors toward the rich via the simple mediation of relative deprivation. We proposed that two possible reasons may account for this finding. Firstly, Confucianism, a dominating philosophy in China since the Han Dynasty two thousand years ago, explicitly gives negative evaluations toward the rich on the morality dimension (Gerth, 2011; S. J. Wu et al., 2018). As an example, there is a well-known idiom—be rich and cruel (*wéi fù bù rén*). In this ideology, it is not surprising that participants directly took actions against the rich when they perceived their undeserved disadvantages relative to the rich. Secondly, since the Chinese government implemented the Reform and Opening Up Policy in 1978, the gap between the rich and the poor has been widening, and this issue has been particularly serious in recent years (Xie & Zhou, 2014). This social situation may also increase participants' probability of displaying aggressive behaviors toward the rich when they realize that the rich should be responsible for their disadvantages.

General Discussion

In the present research, three studies were conducted to examine the effect of visual wealth exposure on social media on relative deprivation and the linked downstream consequences. By conducting an online questionnaire survey, Study 1 found that there was a significantly positive correlation between visual wealth exposure and relative deprivation, and upward social comparison played a mediating role between them, thus providing correlational evidence for H1 and H2. By conducting an online experiment, Study 2 conceptually replicated the findings of Study 1, providing causal evidence for H1 and H2. By conducting an online experiment, Study 3 found that visual wealth exposure on social media increased individuals' hostility toward the rich, and relative deprivation played a mediating role between them. Further analysis showed that the increased hostility toward the rich motivated individuals to display more aggressive behaviors toward the rich. The present research carried theoretical and practical implications.

Theoretical Implications

Social media is popular across the world, which provides a great convenience for people to compare with each other in a broader network. Due to the positivity bias on social media, individuals with frequent social media use tend to mistakenly perceive their disadvantages relative to similar others, thus generating relative deprivation (Chou & Edge, 2012; Lilly et al., 2023). Notably, while a large body of research reveals the association between social media use and relative deprivation, some other research suggests the association between them may be flexible and vary with some individual and situational factors (Cho, 2014; Gkinopoulos et al., 2023; Lilly et al., 2023; H. J. Park & Park, 2024). For example, in a five-year longitudinal research, researchers found that those individuals with high social media use tended to report high personal relative deprivation, however, after adjusting for those stable between-person differences, within-person changes in social media use failed to predict changes in personal deprivation over time (Lilly et al., 2023). In another research, researcher found that communication with influential others was significantly and positively correlated with social capital, and social capital was helpful for reducing relative deprivation (Cho, 2014). Extending prior literature, the present research first demonstrated the flexibility of the relationship between social media use and relative deprivation by clarifying a specific activity on social media—exposure to visual wealth. According to our findings, exposure to visual wealth made individuals experience upward social comparison, which in turn led to greater relative deprivation (in comparison to natural scenery exposure). Importantly, greater relative deprivation induced by exposure to visual wealth further increased hostility of the poor toward the rich. In the following section, we will discuss this issue in a detailed way.

The present research found that visual wealth exposure on social media increased participants' hostility toward the rich via the mediating role of relative deprivation. And the increased hostilities further motivated participants to display aggressive behaviors toward the rich. Despite the fact that economic inequality has existed in human society for a long time, it is difficult for individuals to accurately assess their positions in the social hierarchy. And people seem to be overly optimistic about their future economic income (Batista et al., 2023; Willis et al., 2022). Moreover, some ideologies (e.g., social class stereotypes, system justification beliefs) also help maintain the rationality of the existing social hierarchy (Day & Fiske, 2017; Durante et al., 2013; Kay & Jost, 2003). For example, the stereotype content model reveals that advantaged groups are generally stereotyped as competent but cold, and disadvantaged groups are generally stereotyped as warm but incompetent (Fiske et al., 2002). As a result, individuals in most societies, including those in disadvantaged positions, tend to accept the existing social hierarchy, rather than take against it (Shariff et al., 2016). However, by a more direct social comparison, wealth exposure on social media will make most individuals' disadvantages more salient. Additionally, in most cases, individuals are willing to display their wealth on social media, but they are less willing to explain how they acquire the wealth. The lack of explanations for enormous wealth may threaten the legitimacy of the social hierarchy (Lammers et al., 2008; Magee & Galinsky, 2008), resulting in the perception that the rich's wealth is undeserved. Such two possible factors may both increase individuals' hostility and aggressive behaviors toward the rich.

The present research enriched the work on online positive self-presentation. Compared to offline settings, online settings are considered to be more "suitable" for self-presentation (Krämer & Winter, 2008), where individuals can present a positive self-image in a more effective way. For example, when engaging in online fitness activities, women tend to present ideal body images by using a variety of beauty filters (Raggatt et al., 2018). Notably, this online positive self-presentation is not exclusively limited to women. Studies including both male and female college students also demonstrate that college students tend to portray themselves as interesting on social media

by posting photos of extreme sports (Manago et al., 2008) or listing interests such as traveling and partying (Zhao et al., 2008). Even for adolescents who are developing a stable and consistent sense of self, also tend to maintain a positive presentation by sharing some success stories relevant to themselves on social media; in contrast, negative experiences or emotions are rarely shared by adolescents (de Lenne et al., 2018; Mendelson & Papacharissi, 2010). With respect to the present research, we found that the mean value of visual wealth exposure on social media was 35.83 in Study 1 ($SD = 8.37$), significantly higher than the median 28, $t(156) = 11.72$, $p < .001$, $d = 0.94$. That means, besides the above activities that were documented in previous literature, more and more people are willing to create a positive self-image by flaunting wealth on social media. From another perspective, this finding also indicates the prevalence of materialism in contemporary society, which is typically defined as one's positive attitude towards possessions and material things as well as the desire to constantly increase them (Dittmar, et al., 2014; Ozimek et al., 2024). Individuals with higher levels of materialism may be more sensitive to wealth-relevant symbols on social media, thus experiencing greater relative deprivation. Indeed, by conducting field and lab studies, Zhang and Zhang (2016) have found that materialistic cues increase personal relative deprivation. Given that, we needed to consider the possible moderation of materialism for the effect of visual wealth exposure on relative deprivation.

Noteworthy, when we investigated participants' hostility toward the rich, we did not explicitly ask participants to report their aggressive affect toward the protagonist in the vignette though the measurements of aggressive behaviors were explicitly oriented toward the protagonist. It indicates that relative deprivation on the individuals' level can evoke the hostility toward the rich on the group level, and this hostility on the group level may further guide judgments about specific group members. To some extent, our findings were consistent with the research by Greitemeyer and Sagioglou (2016), which found that relative deprivation had a significant and positive prediction on interpersonal aggression—including aggressive affect and behaviors. Moreover, participants displayed aggressive affect and behaviors even toward those neutral targets (not responsible for participants' relative deprivation; Greitemeyer & Sagioglou, 2016). However, inconsistent with our findings, Greitemeyer and Sagioglou (2017) found that relative deprivation motivated participants to display aggression only toward targets that were the source of participants' experience of disadvantage. This discrepancy between the present research and Greitemeyer and Sagioglou's (2017) research may be caused by the ambiguous situation in Study 3. Specifically, we in Study 3 deliberately developed an ambiguous situation (e.g., no detailed introduction about the protagonist) so that participants' cognition and behaviors could be guided by their preexisting beliefs. As a result, participants' hostility and aggressive behaviors toward the rich were not associated with specific targets. Another possible reason was the widening income gap and rampant corruption in Chinese society (Tan et al., 2017; X. Wu & Lin, 2020; Zhou, 2009). In this social context, it is not surprising that acute exposure to visual wealth provoked individuals' universal hostility toward the rich.

Practical Implications

In March 2023, a netizen named "Arctic Catfish" posted a message on social media, which contained immodest displays of numerous wealth, such as *I have a nine-figure deposit, and I can travel to any country if I want*. This message got a lot of attention from other netizens in a short time, and of course, they felt angry and resentful toward "Arctic Catfish". Finally, under the powerful public opinion pressures, the government launched a formal investigation into the legitimacy of the large wealth of "Arctic Catfish". In recent years, social media has been considered to play an important role in evoking social class antagonism (Y. J. Park et al., 2018), the Chinese government thus does not allow people to discuss some sensitive topics on social media that may provoke class antagonism. However, considering that flaunting wealth in general is a voluntary action of individuals, it is impossible to absolutely eliminate the phenomenon of flaunting wealth on social media. In this situation, social media platforms can introduce the positivity bias for users on the platform, so that they can learn about how visual wealth exposure produces a detrimental effect on their self-evaluation—the so-called media literacy (Paxton et al., 2022). In this way, the feelings of social media users' disadvantages may be alleviated. Supporting our reasoning, prior research found that, although exposure to ideal images on social media had negative effects on body image of women, they were less likely to internalize those images as beauty standards when they realized the so-called ideal bodies were digitally modified (Perloff, 2014; Vendemia & DeAndrea, 2018).

Limitations and Future Work

Several limitations exist in the current research. Firstly, the present research found that exposure to visual wealth on social media increased individuals' relative deprivation, but we did not differentiate whether participants actively browsed wealth-relevant content or were passively exposed to the content. Prior research suggests that active and passive social media use will produce completely opposite effects on individuals' mental health (Burnell et al., 2019; Frison & Eggermont, 2017; Pan et al., 2023; Quiroz & Mickelson, 2021). For example, Pan et al. (2023) found that passive TikTok use was negatively associated with body self-esteem, whereas active TikTok use was positively associated with body self-esteem. Given that, future work should investigate whether the effect of visual wealth exposure on relative deprivation will vary with users' motivation (active use vs. passive use). Additionally, social comparison orientation may also moderate the effect of visual wealth exposure on relative deprivation. Specifically, while social comparison is considered to be an instinctive inclination, previous research has demonstrated that individual differences exist in this inclination (Gibbons & Buunk, 1999). So, compared to individuals with weak social comparison tendency, individuals with strong social comparison tendency may experience more feelings of disadvantages when exposed to visual wealth. Thirdly, prior research found that greater income inequality was associated with greater hostility toward the rich in a society (X. Wu & Lin, 2020; Zhou, 2009). It means that the pattern of the results observed in the present research may vary with specific societies/countries, and further cross-cultural research is needed to thoroughly resolve this issue. Fourthly, in Study 3, we created a wealth-relevant scenario in which a rich man/woman showed off his/her wealth on social media. Then, we assessed participants' hostility toward the rich by creating an imaged online petition. By doing so, we assessed participants' online aggression tendency toward the rich. Although data analysis showed that visual wealth exposure led to aggressive behaviors toward the rich via the chain-mediating role of relative deprivation and hostility, we must keep in mind that aggression is a complicated and multi-faceted construct. More work should be done to assess the reliability of this results pattern in different contexts. Finally, in Study 2 and 3, we presented wealth-relevant images for participants in the wealth exposure condition and presented natural scenery images for participants in the control condition. Despite the manipulation check indicating the effectiveness of our manipulation, there was still a slim possibility that natural scenery images were interpreted as a representation of wealth (participants might think it was a post from their last vacation). Thus, we may need to create a "pure" control condition in future research to basically rule out this possibility.

Conclusions

By conducting an online questionnaire survey and two online experiments, the present research demonstrated that frequent exposure to visual wealth on social media would make individuals experience more upward social comparisons, which in turn resulted in greater relative deprivation. Additionally, via the mediating role of relative deprivation, exposure to visual wealth could increase individuals' hostility and aggressive behaviors toward the rich. The present research firstly clarifies how visual wealth exposure on social media increases individuals' relative deprivation, and uncovering the mediating role of relative deprivation between visual wealth exposure and hostility toward the rich carries implications for how authorities can alleviate increasingly serious class antagonism between the poor and the rich.

Conflict of Interest

The authors have no conflicts of interest to declare.

Use of AI Services

The authors declare they have not used any AI services to generate or edit any part of the manuscript or data.

Authors' Contribution

Xiumei Yan: writing—original draft, writing—review & editing. **Yu Fu:** formal analysis. **Feng Yang:** designing the research, writing—original draft, writing—review & editing. **Yang Han:** data collection, formal analysis.

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Ethics Statement

The studies involving human participants were reviewed and approved by the Ethics Committee of Taishan University. The participants provided their written informed consent to participate in this study.

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Data Availability Statement

Databases in the present research were uploaded on OSF <https://osf.io/vyzpa>.

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Appendix

Rating Analyses for Images of Study 2 and 3

In Study 2, the presented 20 wealth-relevant images were selected by two psychological postgraduates from an image pool consisting of 60 wealth-relevant images. All images were selected from available open resources on the internet. The selected wealth-relevant images can be classified into five categories—vehicles, cosmetics, jewelry, villas, and money. In an independent pretest ($n = 29$, 14 males, 15 females), we asked participants to report the extent to which each image can be regarded as a wealthy symbol on the 7-point scale (1 = *not at all*, 7 = *strongly*). The results showed that the mean was 5.52 ($SD = 1.24$), significantly higher than the median $t(28) = 6.57, p < .001$. In another pretest, we invited 33 undergraduates to rate perceived quality of images, and no significant difference was found between the two conditions ($M_{\text{wealth}} = 4.64, M_{\text{scenery}} = 4.67$), $t(32) = 0.6, p = .55$. The above results indicated that the selected images can be applied to the visual wealth exposure manipulation in Study 2.

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