It Looks Like "Theirs": When and Why Human Presence in the Photo Lowers Viewers' Liking and Preference for an Experience Venue

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ABSTRACT

Consumers and marketers often post photos of experiential consumption online. While prior research has studied how human presence in social media images impacts viewers' responses, the findings are mixed. The present research advances the current understanding by incorporating viewers' need for self-identity into their response model. Six studies, including an analysis of field data (14,725 Instagram photos by a top travel influencer) and five controlled experiments, find that the presence (vs. absence) of another human in the photo of an identity-relevant experience (e.g., a vacation, a wedding) can lower viewers' liking and preference for the venue (i.e., the vacation destination, the wedding venue) in the photo. This effect is mediated by viewers' feelings of others' ownership of the venue and moderated by the relevance of the experience to the viewer's self-identity as well as the distinctiveness of the human in the photo. This research is the first to investigate the impact of human presence in shared photos through the lens of psychological ownership and the identity-signaling function of ownership. The findings offer practical insights into when marketers should avoid human presence in advertisements and how to mitigate the negative impact of human presence in online photos.

Keywords: Experiential consumption, Field data, Image analysis, Psychological ownership, Self-identity

Consumers and marketers often post photos of experiential consumption online. Examining photos of national parks of the U.S. on TripAdvisor reveals that about 10% of the posted photos include humans (by June 22, 2022). Similarly, more than half of the cover photos of wedding venues at The WeddingWire, a public company that connects consumers with local wedding professionals, include a wedding couple (by April 5, 2022). The prevalence of human presence in these photos raises an interesting and managerially important question: How does human presence in photos of experiential consumption (e.g., a vacation, a wedding) impact photo viewers' liking or preference for the venues in the photos (i.e., the vacation destination, the wedding venue)?

While recent research has studied how human presence (vs. absence) in online photos impacts viewers' perceptions or responses, the findings are somewhat mixed. For instance, Poor, Duhachek, and Krishnan (2013) found that the human presence in photos of unhealthy foods *increased* viewers' food taste perception during the subsequent consumption of the food. Bakhshi, Shamma, and Gilbert (2014) showed that human presence in Instagram photos of random content *increased* viewers' engagement (i.e., likes and comments) with the photos, yet Li and Xie (2020) found that human presence in Instagram photos of airline companies had *no impact* on viewers' engagement with the photos. More recently, Hartmann et al. (2021) found that the presence of a familiar human's face in Twitter or Instagram photos of branded products (e.g., candy, cereal, ice cream) *increased* viewers' engagement with the photos but *decreased* their purchase intention for the products in the photos.

The present research investigates an important factor that was overlooked in prior research: photo viewers' need to construct and communicate their self-identity (Belk 1988; Berger and Heath 2007; Grewal, Stephen, and Coleman 2019; Kleine, Kleine, and Allen 1995).

Considering the identity-signaling function of ownership (see Pierce and Peck 2018 for a review) and human-object associations as the antecedent of psychological ownership (Beggan and Brown 1994; Brown, Lawrence, and Robinson 2005; Ehrsson, Spence, and Passingham 2004; Kirk, Peck, and Swain 2018), we propose a previously overlooked path for human presence in online photos to affect photo viewers' responses: through photo viewers' feelings of others' ownership of the product in the photo.

Six studies, including analyses of 14,725 Instagram photos by a top travel influencer and five controlled experiments, consistently find that the presence (vs. absence) of a human in the photo of an experiential consumption venue can lower the photo viewer's liking and preference for the venue in the photo. This effect is mediated by viewers' feelings of others' ownership of the venue and moderated by the relevance of the experience to the viewer's self-identity, as well as the distinctiveness of the human in the photo.

The present research makes several important theoretical contributions. First, our work adds to the nascent body of research on the impact of human presence in digital or social media marketing (see table 1 for an overview). Specifically, prior research has mostly demonstrated the *positive* effects of human presence, such as increasing viewers' trust of a website or engagement with the posted content. Our findings complement the prior research that shows the potential *negative* effect of human presence on viewers' purchase intention (Hartmann et al. 2021; Naylor, Lamberton, and West 2012). In particular, we not only show when and why human presence in online or social media photos would produce a negative effect, but also demonstrate boundary conditions of this effect.

TABLE 1

RESEARCH ON THE IMPACT OF HUMAN PRESENCE IN DIGITAL OR SOCIAL MEDIA MARKETING

Category I. Independent variable: the presence (vs. absence) of a human(s) in the photo					
Research	Type of photos	Type of human	Moderator(s)	Dependent variable(s)	Effect
Bakhshi et al. (2014)	Instagram photos of random content	Not specified	N/A	Viewers' engagement with the photos	Positive
Hartmann et al. (2021)	Twitter or Instagram photos of products	Not specified	N/A	Viewers' engagement with the photos	Positive
				Viewers' purchase intention for the products in the photos	Mixed
Herhausen et al. (2020)	Photos on a service website	Employee	Customer orientation, accessibility of the employee	Viewers' service quality perception of the website	Positive
Li and Xie (2020)	Twitter photos of SUVs	Not specified	N/A	Viewers' engagement with the photos	Positive
	Instagram photos of airlines				Null effect
Poor et al. (2013)	Photos of unhealthy foods	Other consumer	Healthiness of the food	Viewers' food taste perception during the subsequent consumption of the food	Positive
Category II. Independent variable: the presence (vs. absence) of a photo(s) with a human(s)					
Research	Type of photos	Type of human	Moderator(s)	Dependent variable(s)	Effect
Cyr et al. (2007)	Photos on website	Musicians	N/A	Viewers' perceived usefulness, trust and enjoyment of the website	Positive
Cyr et al. (2009)	Photos on website	Not specified	N/A	Viewers' trust of the website	Positive
Darke et al. (2016)	Photos on website	Business owner	Distribution channel	Viewers' trust of the website	Positive
Hassanein and Head (2007)	Photos on website	Other consumer	N/A	Viewers' perceived usefulness, ease of use, trust, enjoyment of the website	Positive
Naylor et al. (2012)	Photos on a brand's social media page	Other consumer	Similarity, heterogeneity, evaluation mode	Viewer's liking of the brand	Mixed

Second, our work adds to the existing literature on identity-based consumption (e.g., Atasoy and Morewedge 2018; Belk 2013; Berger and Heath 2007; Carter and Gilovich 2012; Grewal et al. 2019; Reed 2004; Van Boven and Gilovich 2003; Weiss and Johar 2016). For example, recent research by Grewal et al. (2019) has empirically demonstrated that consumers use virtual associations between themselves and a product (e.g., posting about a product on social media) as an alternative way of actually owning the product to signal their self-identity. Our work corroborates the previous research and further demonstrates that virtual associations between a consumer and a product (e.g., the presence of a consumer in the photo of a venue) can lead other consumers to infer the prior consumer's ownership of the product.

Lastly, our work contributes to the existing research on word-of-mouth (WOM) by showing when and why the content of shared photos can impact viewers' preference for a product. Specifically, while existing research provides a good understanding of how transmitters' needs or motives impact the content they share (e.g., Chen 2017; Dubois, Bonezzi, and De Angelis 2016; for a review of earlier research, see Berger 2014), less research examines how receivers' needs impact their responses to the shared content (Poor et al. 2013; Wang, Zhu, and Shiv 2012). Our findings that human presence (vs. absence) in shared photos can hurt viewers' preference for a product corroborate the preexisting view that most online WOM is self-serving (i.e., driven by the transmitters' need, not the receiver's need; Berger 2014) and the finding that early adopters may share content about a new product in a way that prevents others from owning it (Moldovan, Steinhart, and Ofen 2015).

Practically, the present findings have important implications. First, research shows that consumers are increasingly likely to share photos of their personal experiences on social media (Carter and Gilovich 2012; Diehl, Zauberman, and Barasch 2016; Hu, Manikonda, and

Kambhampati 2014; Kumar and Gilovich 2015; Valsesia and Diehl 2022). Meanwhile, marketers tend to encourage consumers to share their consumption experiences with others (Chae et al. 2017; Godes and Mayzlin 2009; Harmeling et al. 2017). While most of the existing research emphasizes the *positive* impact of sharing experiences, such as increasing the sharer's happiness and perceived value of those experiences (Beike, Brandon, and Cole 2016; Lambert et al. 2013; Langston 1994; Reis et al. 2010), little research examines the negative impact of sharing experiences with others (Barasch, Zauberman, and Diehl 2017). Our work is the first to show that, when sharing photos of personal experiences with others, some content in shared photos (specifically, human presence) can *hurt* the viewer's liking and preference for the venues in the photos, when the venue is for an identity-relevant experience. The findings suggest that, if marketers encourage consumers to share their personal experiences (e.g., a vacation, a wedding) with others, they should not encourage consumers to include themselves in the photos (i.e., selfies).

Second, our work not only cautions marketers that human presence in shared photos can have a negative impact on viewers' liking and preference for the venue in the photo, but also reveals when the effect would occur and how to mitigate the effect. Specifically, we show that human presence in photos of less identity-relevant experiences would not produce a negative effect on photo viewers' liking or preferences. Additionally, the negative effect would be attenuated if the human in the photo has a distinctive identity, such as the employee or the owner of the venue.

Finally, customer engagement (e.g., number of likes or comments) has been one of the most important metrics that marketers use to assess the success of an ad campaign (Bakhshi et al. 2014; Hartmann et al. 2021; Li and Xie 2020). While all prior research demonstrates that human

presence in social media images can *increase* viewers' engagement (Bakhshi et al. 2014; Hartmann et al. 2021; Herhausen et al. 2020; Li and Xie 2020), the present research is the first to show that human presence in social media images can *decrease* viewers' engagement.

We next build our theoretical model (see figure 1) using the antecedents and the identity-signaling function of psychological ownership as the bases of our arguments. We then describe the field study and five controlled experiments that directly test our hypotheses (see table 2 for a summary). Finally, we discuss the theoretical and managerial implications of our findings.

THEORETICAL FRAMEWORK

Person-Object Associations and Feelings of Others' Ownership

Psychological ownership, also termed "the feeling of possessiveness," "the feeling that something is MINE" or "feelings of ownership" (Pierce, Kostova, and Dirks 2001; 2003) is a growing area in marketing (see Hulland, Thompson, and Smith 2015; Lamberton and Goldsmith 2020; Morewedge et al. 2021; Peck and Luangrath 2023 for a review). Like legal ownership, psychological ownership enhances people's evaluation of a product (see Morewedge and Giblin 2015 for a review). Unlike legal ownership, psychological ownership can be felt for targets not legally owned such as public parks, lakes, and hiking trails (Mullenbach et al. 2019; Peck et al. 2021) and can be infringed when people feel another individual is signaling ownership of the same target (Kirk et al. 2018).

Person-object associations are the antecedent of psychological ownership (Atasoy and Morewedge 2018; Belk 1988; Ehrsson et al. 2004; Pierce et al. 2003). People use person-object associations to infer a person's ownership of the object (Beggan and Brown 1994; Cleroux, Peck, and Friedman 2022; Friedman 2008; Friedman and Neary 2008; Isaacs 1933; Kim 2017; Kirk et al. 2018; Pierce et al. 2003). For example, when dividing assets during a divorce, people feel that the person pictured with an object has a stronger claim of ownership over the object than the other person who was not pictured with the object (Beggan and Brown 1994). When feelings of personal ownership of an object is threatened, consumers post selfies with the object on social media as a way of communicating their ownership of the object (Kirk et al. 2018). These findings suggest that, seeing an object associated with another individual would result in the viewer's feeling that the object is others' or feelings of others' ownership of the object. Therefore, we predict that the presence of another human in the photo of an experience venue would lead photo viewers to feel that the venue is "theirs" (not "mine").

Prior research on territorial responses has demonstrated that, once people infer others' ownership of an object or area, they would anticipate less personal ownership of that object (Kirk et al. 2018) and be hesitant to venture into that area (Brown et al. 2005). As anticipated ownership predicts individuals' evaluation of and preference for products (e.g., Ariely and Simonson 2003; Ericson and Fuster 2011; Heyman, Orhun, and Ariely 2004; Peck and Shu 2009; Sevilla, Zhang, and Kahn 2016; Shu and Peck 2011; Weiss and Johar 2013), we predict that, when people feel that a venue is *someone else's*, they would like the venue less and prefer other alternative venues over the venue in question.

To summarize, based on prior research on the antecedent of feelings of ownership and people's response to the feeling of others' ownership, we predict that, the presence of another

human in the photo of an experience venue would associate the human in the photo with the venue in the photo and lead photo viewers to infer that someone else has had personal ownership of the venue in the photo. Consequently, photo viewers will like the venue in the photo less and prefer other alternative venues. Hereby, we propose our primary hypothesis and the underlying process:

H1: The presence (vs. absence) of another human in the photo of an experience venue will lower the photo viewer's liking and preference for the venue in the photo.

H2: The effect in H1 occurs because the presence of another human in the photo leads to the photo viewer's feelings of others' ownership of the venue in the photo.

Relevance to Viewers' Self-identity as a Moderator

Psychological ownership is rooted in people's need for self-identity (i.e., the sense of "who I am"; Pierce et al. 2001; 2003). Identity-relevance has been demonstrated as an antecedent of psychological ownership (Atasoy and Morewedge 2018). People are motivated to feel ownership of something if it can define and communicate their self-identity (Belk 1988; Berger and Heath 2007; Escalas 2013; Kleine et al. 1995; Pierce et al. 2001). If a product is not self-defining or not identity-relevant, consumers would not be sensitive to the product's capacity to garner psychological ownership (Atasoy and Morewedge 2018) or to other people's infringement of psychological ownership of the product (Berger and Heath 2007). Therefore, we predict that, if photo viewers are looking for a venue for a less identity-relevant experience, they would be

less motivated to feel personal ownership of the venue and thus would be less sensitive to the cue of others' ownership of the venue. As a result, the presence of another human in the photo would not lead to photo viewers' feelings of others' ownership of the venue or lower their preference for the venue in the photo. Hereby, we propose the following moderator of our primary hypothesis:

H3: The negative effect of human presence in H1 is attenuated when the photo viewer is considering the venue for a less identity-relevant experience.

Distinctiveness of the Human in the Photo as a Moderator

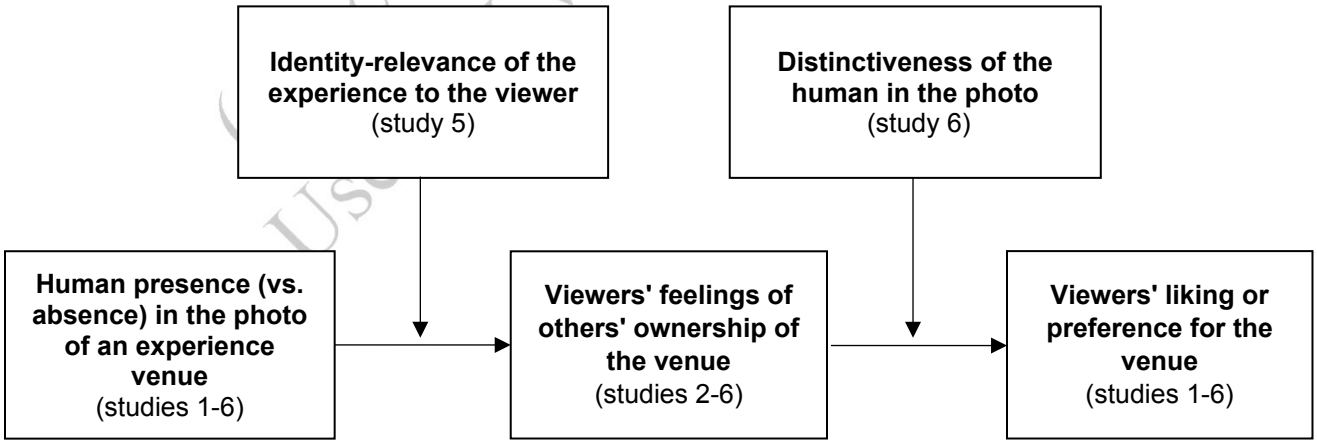
People have a universal need for a distinct self-identity (Belk 1988; Maslow 1968; Ratner, Kahn, and Kahneman 1999). Because people see personal ownership of an object, experience or space as an important way to distinguish themselves from others, they avoid options that others have had ownership of when they feel similar to others (Fromkin 1968; 1970). This suggests that while a similar other in a photo may be viewed as competing for ownership and could displace the viewer, this is not always the case. Specifically, photo viewers may be less averse to going to the same venue as the human in the photo if the human in the photo has a distinctive identity and thus does not compete with photo viewers for the identity that photo viewers expect from the ownership of the venue. We further hypothesize that, if the human in the photo is not competing with photo viewers for the same identity, the presence of this human in the photo would not lessen the identity-signaling potential of the venue for photo viewers. An example of such scenario is when the human in the photo is the employee or owner of the venue,

whose presence may be expected as part of the experience. We predict that although in the photo of an identity-relevant venue, the presence of the employee or owner of the venue will induce photo viewers' feelings of others' ownership of that venue, it will not pose a threat to the identity-signaling potential of the venue for photo viewers, because photo viewers see the employee or owner as distinctive and not competing with them for the feeling of ownership of the venue as a customer. Therefore, the presence of the employee or owner of the venue in the photo will not lower the viewer's preference for the venue. More formally, we propose the following:

H4: The negative effect of human presence in H1 is attenuated when the human in the photo has a distinctive identity (e.g., owner of the venue).

FIGURE 1

CONCEPTUAL FRAMEWORK



OVERVIEW OF STUDIES

We present six studies in the main manuscript. Study 1 is based on the field data of 14,725 Instagram photos scraped from a top influencer's public account. The results lend initial support to our primary hypothesis (H1) by showing a negative relationship between the presence of a human in the photo and the number of likes or comments the photo received, after controlling for possible confounding variables. Studies 2-6 are controlled experiments. Study 2 further supports the primary hypothesis (H1) and demonstrates the mediating role of the feeling of others' ownership of the venue (H2). Study 3 manipulates the pose of the humans in the photos. The results further support the main hypothesis and its process (H1, H2). Study 4 replicates the main findings of previous studies with an incentive-compatible design. Study 5 demonstrates a theory-based moderator of the main hypothesis: identity-relevance of the experience (H3). Study 6 demonstrates another theory-based moderator of the main hypothesis: the distinctiveness of the human in the photo (H4). See table 2 for an overview of the studies.

In a post-study, we recruited 201 participants from Prolific (49% female, M_{age} = 43; one participant did not provide demographic information) for a nominal payment, and asked them whether the experiences in studies 2, 3, 4 and 6 were identity-relevant (1 = Extremely irrelevant, 7 = Extremely relevant). The results indicated that the experiences in studies 2, 3, 4 and 6 were all identity-relevant. See web appendix A for details.

In all studies, we predetermined a sample size of at least 100 per cell. We report all details about sample size determination and exclusions in web appendix B. All data and the web appendix are available in the Open Science Framework (OSF): https://osf.io/z5yq4/?view_only=3dae035857194250ac71ab5da3e1af99.

TABLE 2

OVERVIEW OF MAIN STUDIES AND FINDINGS

Study	Context	Design	Dependent variables	Alternative explanations (ruled out)	Main findings
1	Travel destinations	Field data (14,725 photos on Instagram)	Numbers of likes and comments		The presence (vs. absence) of a human in the photo of a travel destination lowered photo viewers' liking for the photo.
2	Hiking trails	3-condition (no hiker vs. a hiker facing away from the viewer vs. a hiker facing the viewer)	Preference for the focal trail, feelings of others' ownership	Crowdedness of the trail, appearance of the hiker	Regardless of whether the human faces the viewers or not, the presence of a human in the photo of a hiking trail led to photo viewers' feelings of others' ownership of the trail and lowered photo viewers' preference for the trail.
3	Wedding venues	3-condition (no couple vs. a couple with a neutral pose vs. a couple with a happy pose)	Preference for the focal venue, feelings of others' ownership	Pose of the couple	Regardless of the pose of a wedding couple, the presence of a couple in the photo of a wedding venue led to photo viewers' feelings of others' ownership of the venue and lowered their preference for the venue as their wedding venue.
4	Performance centers	2-condition (no visitor vs. a visitor), incentive compatible	Preference for the focal center, feelings of others' ownership	Crowdedness of the center, realism of the photo	The presence of a human in the photo of a performance center led to photo viewers' feelings of others' ownership of the performance center and lowered photo viewers' preference for the performance center.
5	Wedding venues	2 (identity-relevant vs. less identity-relevant) x 2 (no couple vs. a couple)	Preference for the focal venue, feelings of others' ownership	Ease of self-imagery, relative attractiveness of person/venue	The presence of a wedding couple in the photo of a wedding venue increased photo viewers' feelings of others' ownership of the venue and lowered their preference for the venue for an identity-relevant wedding, but not for a less identity-relevant wedding.
6	Dining restaurants	3-condition (no person vs. a prior customer vs. the restaurant owner)	Preference for the focal restaurant, feelings of others' ownership	Ease of self-imagery, perceived scarcity, perceived uniqueness	The presence of a human in the photo of a dining restaurant increased photo viewers' feelings of others' ownership of the restaurant and lowered their preference for the restaurant if the human in the photo had an indistinctive identity (a prior customer), but not if the human in the photo had a distinctive identity (the restaurant owner).

STUDY 1. FIELD DATA OF INSTAGRAM PHOTOS OF TRAVEL DESTINATIONS

Study 1 tests our main hypothesis (H1) that human presence (vs. absence) in the photo of an experience venue hurts photo viewers' liking for the venue. We examine all the photos that were posted by the top travel influencer on Instagram, which allows us to control for the photo transmitter's reach, impact, and posting frequency. We use photos of travel destinations because consumers perceive travel as a highly identity-relevant experience (Bhattacharjee and Mogilner 2014; Keinan and Kivetz 2011; Zauberman, Ratner, and Kim 2009).

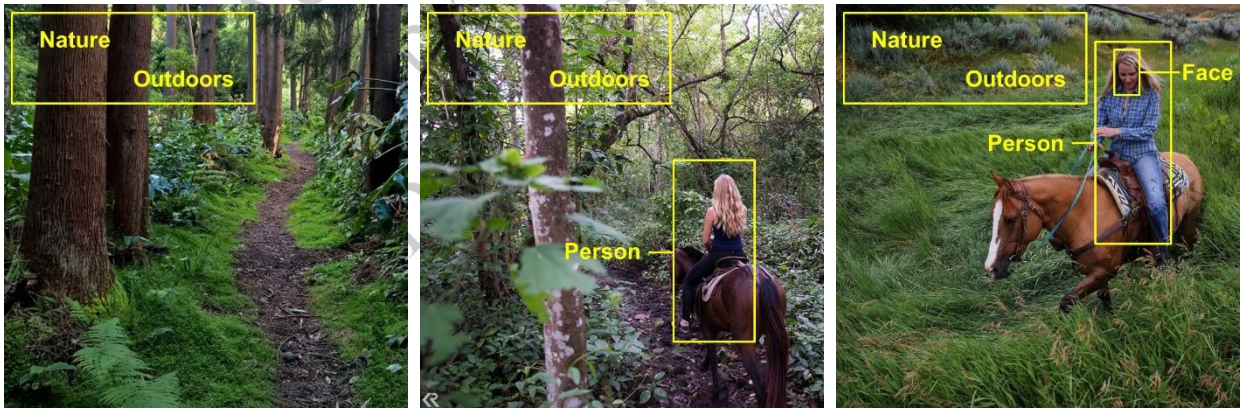
Method

First, we identified the top Instagram influencer that posts contents on travel (via https://www.heepsy.com) by the time of this study. At the time we conducted this study, this influencer had posted 14,725 photos of travel destinations and had 45 million followers on Instagram. Then, we used Amazon Rekognition (https://aws.amazon.com/rekognition/), a cloud-based deep-learning powered image recognition service, to label whether there was a "person" in each photo, and whether there was a "face" in each photo (see figure 2 for illustration; all three photos were posted by the top influencer on Instagram). Note that, we labelled whether there was a "face" in each photo, because this would allow us to test whether our main hypothesis is a "face" effect or a "person" effect.

We categorized all photos into three categories: photos that do not include a "person" (category I), photos that include a "person" but no detected "face" (category Ⅱ), and photos that include a "person" with a detected "face" (category Ⅲ). By the nature of the categorization scheme, there were no photos that include both "a person with a detected face" and "a person without a detected face," because as long as one face was detected in a photo, that photo was put into category Ⅲ. To facilitate interpretations of the results, we treated category I (i.e., photos that do not include any person) as the baseline condition and created two dummy variables for the regression analysis: X1 was coded as 1 if a photo falls into category Ⅱ and coded as 0 otherwise; X2 was coded as 1 if a photo falls into category Ⅲ and coded as 0 otherwise.

FIGURE 2

ILLUSTRATION OF PERSON AND FACE DETECTION



Category I Category Ⅱ Category Ⅲ

To control for potentially confounding variables, we labeled the top ten contents that were detected most frequently in the posted photos (see table 3 for the frequencies of each) with

Amazon Rekognition. In addition, as the presence of a celebrity in an ad may impact the evaluation of an ad (e.g., Atkin and Block 1983; Kahle and Homer 1985), we labelled and controlled for the presence of a celebrity in each photo. We also coded the length of caption of each photo, the number of hashtags for each photo, and how many days each photo had been posted at the time we conducted this study. Finally, we coded how many likes and how many comments each photo had received by the time of this study. All the information we collected for this study was publicly available.

Results and Discussion

According to Amazon Rekognition, among the 14,725 photos, the ten most frequently detected contents were "outdoor," "nature," "person," "human," "water," "mountain," "animal," "plant," "building," and "mammal." See table 3 for summary statistics. Because the presence of "outdoor" and "nature," "person" and "human," and "animal" and "mammal" were highly correlated (all $rs > .75$, all $ps < .001$), and "person" has been embedded in the dummy coding, to avoid redundancy, we controlled in the regression for the presence of "outdoor," "water," "mountain," "animal," "plant," "building," and "celebrity" in each photo, as well as the interaction term of "celebrity" and "a person with a detected face," the length of caption of each photo, the number of hashtags for each photo, and the number of days each photo had been posted.

TABLE 3

SUMMARY STATISTICS OF FIELD DATA (STUDY 1)

	Mean	*SD*	Frequency
Likes	133952.68	90400.91	
Comments	524.50	547.77	
Photo age (day)	1433.73	874.73	
Number of hashtags	2.93	2.73	
Length of caption (words)	69.97	43.39	
1. Outdoor			51%
2. Nature			51%
3. Person			27%
4. Human			26%
5. Water			16%
6. Mountain			15%
7. Animal			14%
8. Plant			9%
9. Building			9%
10. Mammal			9%
11. Celebrity			1%

NOTE. Numbers are based on photos posted from March 2012 to September 2021.

Number of likes and comments of the photo. In support of our primary hypothesis (H1), after controlling for the above variables, a regression of the number of likes each photo received on the type of the photo (i.e., X1 and X2; see dummy variables described in the method section) showed that having a person with a detected face in the photo predicted fewer likes than having no person in the photo (β = - 42392.31, *SE* = 1837.79; $p < .001$; $\eta_p^2 = .04$). Similarly, having a person *without* a detected face in the photo also predicted significantly fewer likes than having no person in the photo (β = - 17735.59, *SE* = 2074.26; $p < .001$; $\eta_p^2 = .00$). These results suggest

that our primary hypothesis is not a "face" effect, because the mere presence of a "person" in the photo predicted significantly fewer likes for the photo. The same pattern was found with the number of comments, suggesting that the presence of a person in the photo decreased photo viewers' engagement with the photo (see table 4).

Number of faces in the photo. As an exploratory analysis, we also coded how many faces were detected in each photo and investigated whether the number of faces would moderate the effect. Controlling for the same variables, we found that "the presence of multiple faces" in the photo resulted in fewer likes than "the presence of one face" in the photo, which resulted in fewer likes than "the presence of a person without a face" in the photo (see web appendix C for full results). These results suggest that, as a travel destination is associated with more people, photo viewers' feelings of others' ownership of this travel destination might increase, which would further decrease photo viewers' liking for this travel destination.

Study 1 provides preliminary support for the main hypothesis (H1) that human presence in the photo of an experience venue (travel destinations in this study) would negatively affect photo viewers' liking for the venue. As a robustness check, we also analyzed the photos posted by another travel influencer on Instagram (a follower of the influencer in the main study) and found a similar pattern. See web appendix D for more details.

TABLE 4

EFFECTS OF PERSONS AND FACES IN PHOTOS (STUDY 1)

	Model 1		Model 2	
	Likes	Comments	Likes	Comments
No person (baseline)				
Person w/o face (d)	-20951.61***‡ (2078.16)	-76.40***‡ (14.64)	-17735.59***‡ (2074.26)	-60.14***‡ (14.69)
Person w/ face (d)	-53423.68***‡ (1713.96)	-163.12***‡ (12.08)	-42392.31***‡ (1837.79)	-143.90***‡ (13.02)
Photo age	-44.07*** (.73)	-.01 (.01)	-42.88*** (.73)	-.01* (.01)
Number of hashtags	3467.09*** (237.38)	13.33*** (1.67)	3416.91*** (235.66)	11.59*** (1.67)
Length of caption	255.87*** (15.25)	1.69*** (.11)	250.87*** (15.14)	1.58*** (.11)
Outdoor (d)			21326.81*** (1564.83)	5.41 (11.08)
Water (d)			-1522.94 (1855.64)	26.79* (13.14)
Mountain (d)			5090.09** (1970.10)	-25.03 (13.95)
Animal (d)			16806.18*** (1913.69)	160.07*** (13.55)
Plant (d)			11124.52*** (2154.09)	-.31 (15.26)
Building (d)			-4182.44 (2161.68)	-11.69 (15.31)
Celebrity (d)			-26747.58 (17308.50)	-64.39 (122.59)
Celebrity x Person w/ face			11275.22 (18238.08)	-28.51 (129.18)
R^2	.29	.04	.31	.05
Adjusted R^2	.29	.04	.31	.05

NOTE. *p < .05; **p < .01; ***p < .001. ‡ indicates significant differences between "person w/o face" and "person w/ face" at p < .01. Standard errors are in parentheses. Intercept is omitted from the table. (d) = dichotomous.

We acknowledge one limitation of study 1 is that we used the number of likes for a photo as a proxy of the photo viewer's liking for the venue (travel destination) in the photo. One might argue that likes on social media are not always positively correlated with purchase intentions (Grewal et al. 2019; Hartmann et al. 2021; John et al. 2017). To help address this concern, we

ran a post study to examine the relationship between the liking of the photo and the liking of the travel destination in the photo among Instagram users who follow the influencer in study 1. Results of the post study showed that Instagram users' liking of a photo, liking of the travel destination in the photo, perceived attractiveness of the destination in the photo, and interest in visiting the destination in the photo were significantly positively correlated, whether the photo had a person in it or not. These results further support the use of likes on Instagram as a proxy of liking of the travel destinations in the photos in study 1. See web appendix E for more details.

STUDY 2. PRESENCE (VS. ABSENCE) OF A HIKER IN THE PHOTO OF A HIKING TRAIL

Study 2 serves multiple purposes. While study 1 showed support for our hypothesis that the presence of a human in a photo decreases viewer's preference for a venue, we use a well-controlled experiment in study 2 to replicate the previous finding. We include a measure of the feeling of others' ownership to test our proposed process.

We also measure perceived crowdedness of the venue as it might activate people's desire to be distinct from others (Levav and Zhu 2009; Xu, Shen, and Wyer 2012) and may be a potential alternative explanation. For explorative analyses, we also measure photo viewers' perceptions of the level of engagement, the professionalism and the realism of the human in the photo (when a human was present in the photo), because they might affect photo viewers' preference for the venue in the photo (Jang et al. 2021; Kim, Choi, and Wakslak 2019; Ohanian 1991).

Method

Four hundred and fifty participants who were located in the USA or UK, spoke English as their first language and had an approval rate above 95% on Prolific completed this study for a nominal payment. We obtained 416 valid responses (50% female, M_{age} = 44) after excluding responses that had duplicate IP addresses or failed attention check questions.

This study adopted a 3-condition (in the photo of the focal hiking trail: no hiker vs. a hiker facing away from the viewer vs. a hiker facing the viewer) between-subject design. First, all participants were asked to imagine that they were considering hiking somewhere in the next month as a good way to start their new year 2023 (it was December 2022 at the time of this study) and that now they were looking for a hiking trail. Then they read the following:

> *You have an account on a social media site where people share photos, videos and stories with friends and followers. After some browsing there, two hiking trails attract you the most. These two trails are about the same distance from where you live, and have similar difficulty levels. Below are the photos of the two hiking trails. They are posted by the same influencer you follow. Both photos have received hundreds of likes.*

With the scenario, participants were presented with two photos (see figure 3): one photo of hiking trail A (the focal trail), the other of hiking trail B (the alternative trail). We manipulated

the content of the photo of the focal trail, while holding the photo of the alternative trail constant (there was never a human in the photo of trail B). Participants saw a hiker facing the viewer, a hiker facing away from the viewer, or no hiker in the photo of trail A, depending on the condition they were randomly assigned to.

After looking at the photos, participants indicated their preference between the two trails ("Which one of the trails do you prefer for your new year hiking trip?"; 1 = strongly prefer trail A, 4 = indifferent, 7 = strongly prefer trail B). The responses were reverse coded for the ease of interpretation so that a higher value indicated a stronger preference for the focal trail (trail A).

To examine the underlying process of participants' preference construction, we measured participants' feelings of others' ownership of each trail ("I feel like someone else already has a high degree of personal ownership of this hiking trail," "I feel like this is already someone else's hiking trail"; 1 = strongly disagree, 7 = strongly agree) (Pearson *r* for trail A = .73; *r* for trail B = .68; *ps* < .001). We also measured how crowded each trail looks ("The trail in this photo looks crowded"; 1 = strongly disagree, 7 = strongly agree) as a potential alternative account for the impact of human presence on participants' preferences.

Then, participants who were assigned to the two conditions where a hiker was present in the photo rated the level of engagement ("Does the person in the photo look like he was heavily engaged in the hiking activity?"; 1 = not at all, 5 = a great deal), professionalism ("Does the person in the photo look like a professional hiker?"; 1 = not at all, 5 = a great deal) and realism ("Does the person in the photo look like he was really at this place?"; 1 = definitely not, 5 = definitely yes) of the hiker.

FIGURE 3

PHOTOS OF HIKING TRAILS (STUDY 2)

Hiking trail A (the focal trail)			Hiking trail B
No hiker	A hiker facing away from the viewer in the photo	A hiker facing the viewer in the photo	No hiker
			

To get a better understanding of what led to feelings of others' ownership, we also asked participants that were assigned to the two conditions where a hiker was present in the photo "Which of the following might give you the strongest feeling that someone else has a high degree of personal ownership of this hiking trail or that this is already someone else's hiking trail? -- The facial expression of the person/ The facial features of the person/ The pose of the person/ The mere presence of the person in the photo/ The mere presence of the person's face in the photo/ Other (please specify)." Finally, all participants reported their gender and age.

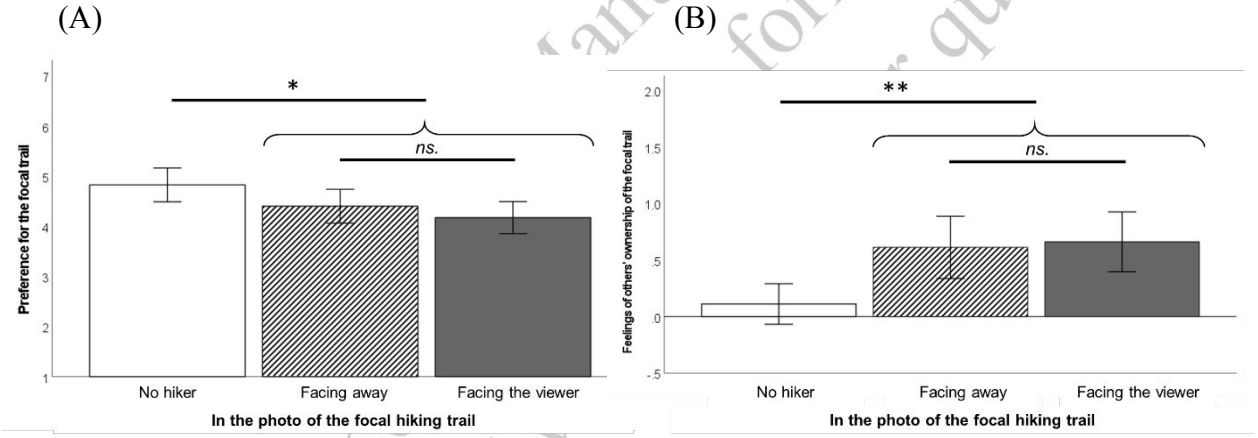
Results and Discussion

Preference for the focal trail. A one-way ANOVA on participants' preference for the focal trail showed a significant main effect of human presence in the photo ($F(2,413) = 3.90$, $p = .021$; $\eta_p^2 = .02$; figure 4A). Planned contrast analyses revealed that, in support of our primary hypothesis (H1), participants' preference for the focal trail was significantly lower if there was a

hiker in the photo (M = 4.29, SD = 1.96) than if there was no hiker in the photo (M = 4.83, SD = 2.02; $t(413) = 2.63$, $p = .009$, $d = 0.27$), with no significant difference between the condition where the hiker in the photo was facing the viewer (M = 4.18, SD = 1.89) and the condition where the hiker was facing away from the viewer (M = 4.40, SD = 2.02; $t(413) = -0.96$, $p = .34$). These results suggest that the effect in H1 was a "human" effect, not a "face" effect.

FIGURE 4

STUDY RESULTS (STUDY 2)



NOTE. *p < .01, **p < .001, Error bars represent 95% confidence intervals.

Feelings of others' ownership of the focal trail. To understand how participants constructed their preferences between the two trails, we took a difference-in-difference approach and calculated participants' feelings of others' ownership of the focal trail relative to the alternative trail by subtracting the score for the alternative trail from the score for the focal trail (Kim 2017; Lechner 2011). A one-way ANOVA on participants' relative feelings of others' ownership of the focal trail revealed a significant main effect of human presence in the photo

($F(2,413) = 6.13$, $p = .002$; $\eta_p^2 = .03$; figure 4B). Planned contrast analyses revealed that, participants' relative feelings of others' ownership of the focal trail was significantly higher if there was a hiker in the photo ($M = 0.64$, $SD = 1.61$) than if there was no hiker in the photo ($M = 0.11$, $SD = 1.07$; $t(413) = -3.49$, $p < .001$, $d = 0.39$), with no significant difference between the condition where the hiker in the photo was facing the viewer ($M = 0.66$, $SD = 1.57$) and the condition where the hiker was facing away from the viewer ($M = 0.61$, $SD = 1.65$; $t(413) = 0.28$, $p = .78$).

For the mediation analysis with a three-level independent variable, following Hayes and Preacher (2014), we constructed two contrasts, X1 (2, -1, -1) corresponding to the no-hiker condition relative to the combination of the hiker-facing-the-viewer and hiker-facing-away-from-the-viewer conditions, and X2 (0, 1, -1) comparing the hiker-facing-the-viewer and hiker-facing-away-from-the-viewer conditions. We ran a simple mediation analysis (PROCESS Model 4, 5000 bootstraps) with X1 as the independent variable, preference for the focal trail as the dependent variable, relative feelings of others' ownership of the focal trail as the mediator, and X2 as a covariate. In support of H2, the presence of a hiker (regardless of the visibility of his face) in the photo of a hiking trail (i.e., trail A, the focal trail) lowered photo viewers' preference for that trail through photo viewers' feelings of others' ownership of that trail ($b = 0.03$, $SE = 0.01$, CI95% [0.003, 0.060]).

What led to feelings of others' ownership of the focal trail. According to participants who saw a hiker in the photo of the focal trail, the top cause of their feelings of others' ownership of the focal trail was "the mere presence of the person in the photo" (53.3%), followed by "the pose of the person" (36.6%; $\chi 2(1) = 8.53$, $p = .003$).

Alternative explanations. To examine whether perceived crowdedness accounted for the main findings, we analyzed the relative crowdedness score in the same way as above. Results showed that the focal trail was perceived as more crowded if a hiker was in the photo (M = 0.36, SD = 1.02) than if not (M = 0.09, SD = 1.09; $t(413) = -2.46$, $p = .014$, $d = 0.26$). However, the mediation analysis revealed that perceived crowdedness did not mediate the effect of the hiker's presence in the photo on photo viewers' preferences ($b = 0.02$, $SE = 0.01$, CI95% [-0.002, 0.043]). We also examined the relationship between participants' perceptions of the hiker in the photo (when a hiker was present in the photo) and their preference for the trail in the photo. Results revealed that, participants perceived the hiker in the photo to be engaged in the activity (M = 3.52, SD = 1.00; significantly above the midpoint of the scale 3, $t(275) = 8.64$, $p < .001$), moderately professional (M = 3.11, SD = 0.97; insignificant from the midpoint of the scale 3, $t(275) = 1.86$, $p = .065$) and really at the trail in the photo (M = 3.33, SD = 1.11; significantly above the midpoint of the scale 3, $t(275) = 4.90$, $p < .001$). Moreover, none of these factors were correlated with participants' preference for the focal trail (ps > .56).

Study 2 provides further evidence for our main hypothesis (H1) that human presence in the photo of an identity-relevant experience decreases photo viewers' preference for the venue in the photo. This study also provides initial evidence for the proposed mediator of the main hypothesis, namely, photo viewers' feelings of others' ownership of the venue (H2). Results of this study rule out perceived crowdedness of the venue and perceived engagement, professionalism and realism of the human in the photo as potential alternative explanations.

We wish to note that, as a robustness check, we applied the same experiment design and the same photo stimuli in this study to a different subject pool (N = 397 undergraduate students

from an introductory business class at a large Midwestern university in the U.S.) and found exactly the same pattern as in the present study. See web appendix F for full results.

STUDY 3. PRESENCE (VS. ABSENCE) OF A WEDDING COUPLE IN THE PHOTO OF A WEDDING VENUE

Study 3 serves two main purposes. First, it extends the findings of the previous studies to another type of identity-relevant experience -- weddings. Second, this study examines a potential moderator of the main effect in H1 -- the pose of the human(s) in the photo. Note that participants in study 2 reported this factor as the second potential cause of their feelings of others' ownership. Therefore, this study manipulated the pose of the wedding couple in the photo and examined whether their pose and related factors (e.g., attractiveness, happiness, level of engagement in the scene) would impact photo viewers' feelings of others' ownership of the venue or their preference for the venue.

Method

Two hundred and ninety-eight participants who were located in the US, spoke English as their first language, and had an approval rate above 95% on Prolific completed this study for a nominal payment. We obtained 274 responses (50% female, M_{age} = 40) after excluding responses that had duplicate IP addresses, failed attention check questions or didn't follow instructions.

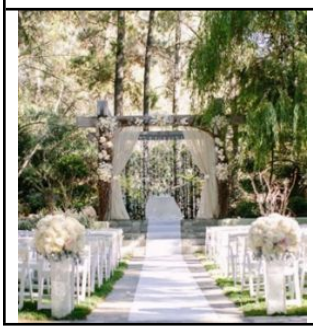
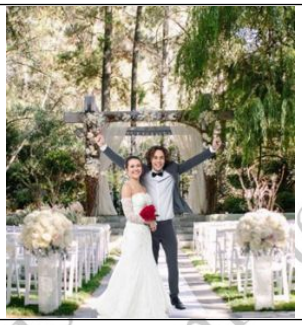
This study adopted a 3-condition (in the photo of the focal venue: no couple vs. a couple with a neutral pose vs. a couple with a happy pose) between-subject design. As in study 2, participants were presented with two photos: one photo of wedding venue A (the focal venue), and the other of wedding venue B (the alternative venue). We manipulated the content of the photo of the focal venue, while holding the photo of the alternative venue constant.

Participants imagined that "*You just got engaged. You are looking for a wedding venue now. You hope to have an unforgettable wedding experience at this venue."* They also imagined that there were two wedding venues that a good friend strongly recommended. These two venues were about the same distance from the city center and had the same capacity (i.e., could accommodate the same number of guests). Along with the scenario, all participants saw photos of the two wedding venues (figure 5).

All participants indicated their preference between the two wedding venues on a binary scale ("Which one of these wedding venues are you more interested in?") and reported their feelings of others' ownership of each venue (r for venue A = .73; r for venue B = .71; $ps < .001$). Participants who were assigned to conditions where a wedding couple was present in the photo also rated how attractive, how happy, how engaged the couple in the photo looked, all on a scale from 1 to 7 (1 = not at all, 7 = very much). Finally, all participants reported their gender and age.

FIGURE 5

PHOTOS OF WEDDING VENUES (STUDY 3)

Venue A (the focal venue)			Venue B
No couple	A couple in the photo		No couple
	Neutral pose	Happy pose	
			

Results and Discussion

Manipulation check. In support of our manipulation, compared to the couple with a neutral pose, the same couple with a happy pose was rated as happier (*Ms* = 5.63 vs. 6.20, *SDs* = 1.01 vs. 0.88; $t(181) = -4.07$, $p < .001$, $d = 0.60$), more attractive (*Ms* = 4.73 vs. 5.34, *SDs* = 1.17 vs. 1.35; $t(181) = -3.28$, $p = .001$, $d = 0.48$) and more engaged in the scene (*Ms* = 4.38 vs. 5.21, *SDs* = 1.69 vs. 1.44; $t(181) = -3.54$, $p < .001$, $d = 0.52$).

Preference for the focal wedding venue. In support of H1, participants' preference for the focal wedding venue (venue A) was lower if a wedding couple was present in the photo of the focal venue than if not (26.8% vs. 52.7%; $\chi2(1) = 17.93$, $p < .001$). The pose of the wedding couple in the photo (neutral vs. happy) did not make a difference on participants' preference for the venue in the photo (24.2% vs. 29.3%; $\chi2(1) = 0.62$, $p = .43$).

Feelings of others' ownership of the focal wedding venue. As in study 2, we calculated participants' feelings of others' ownership of the focal venue relative to the alternative venue, and then conducted a one-way ANOVA ($F(2,271) = 8.09$, $p < .001$, $\eta_p^2 = .06$). In support of H2, participants' feelings of others' ownership of the focal wedding venue was greater if a wedding couple was present in the photo than if not ($Ms = 2.36$ vs. 1.38, $SDs = 1.95$ vs. 1.83; $t(271) = -4.00$, $p < .001$, $d = 0.51$), with no difference due to the pose of the couple ($M_{neutral} = 2.30$, $SD = 1.86$ vs. $M_{happy} = 2.42$, $SD = 2.04$; $t(271) = 0.41$, $p = .68$). Following Hayes and Preacher (2014), we constructed two contrasts, X1 = (2, -1, -1) corresponding to the difference between the condition where no wedding couple was present and the condition where a wedding couple was present in the photo, and X2 = (0, -1, 1) corresponding to the difference between the condition where the couple in the photo had a neutral pose and the condition where the couple in the photo had a happier pose. A mediation analysis, treating X1 as the independent variable and X2 as a covariate, indicated that feelings of others' ownership of the focal venue mediated the effect of the presence of a couple in the photo of the focal venue on participants' preference for the focal venue ($b = 0.15$, $SE = 0.05$, CI95% [0.08, 0.25])

Study 3 provides further support for H1 and H2. Results of this study corroborate findings of study 2 and rule out attractiveness, happiness, level of engagement or the pose of the human in the photo as potential alternative explanations for the main effect.

STUDY 4. PRESENCE (VS. ABSENCE) OF A VISITOR IN THE PHOTO OF A PERFORMANCE CENTER

The key purpose of study 4 is to replicate the main findings with an incentive-compatible design with real consequences, and therefore lend further evidence for H1 and H2. While previous studies used a professional photo editor to help ensure professionalism of the photo stimuli (see web appendix G for more details), for this study we took real photos and examined a potential alternative explanation that photos with a human seem less real than those without a human and therefore lead to a lower preference for the venue in the photo.

Method

All undergraduate students from an introductory business class at a large Midwestern university in the U.S. were invited to participate in this study for extra credit. We obtained 586 valid responses (52% female, M_{age} = 20) after excluding responses who failed an attention check question.

This study adopted a 2-condition (in the photo of the focal performance center: no visitor vs. a visitor) between-subject design. Because prior research suggests that consumers see extraordinary, special or unusual experiences more identity-relevant than ordinary, nonspecial or usual experiences (Bhattacharjee and Mogilner 2014; Keinan and Kivetz 2011; Zauberman et al. 2009), to make sure participants' responses in this study were regarding an identity-relevant experience, in the beginning of the study, all participants read that "*The beginning of a new year often carries special meanings. People often want to have some extraordinary experience at the beginning of a new year.*" Then, they were asked to write down a few things they might do to make the beginning of their new year special and unusual.

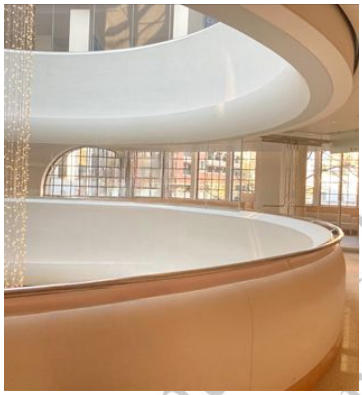
Afterwards, all participants were told that the research team was collaborating with two performance centers that were both highly rated and were a similar distance from campus. Participants were also told that they would see photos of the two performance centers, indicate which one they would like to visit at the beginning of the new year, and enter a lottery for a ticket that was only redeemable at the performance center they chose.

Then, all participants were presented with two photos (figure 6): one photo of performance center A (the alternative performance center), the other of performance center B (the focal performance center). We manipulated the content of the photo of the focal performance center, while holding the photo of the alternative performance center constant.

After looking at the photos, all participants indicated their preference between the two performance centers on a binary scale ("Which one of these performance centers do you prefer to visit at the beginning of your new year 2023?"). They also reported their feelings of others' ownership of each performance center as in the previous studies (r for performance center A = .80; r for performance center B = .78; $ps < .001$), perceived crowdedness of each performance center as in study 2, and perceived realism of each photo ("This photo looks real"; 1 = strongly disagree, 7 = strongly agree). Lastly, all participants reported their gender and age.

FIGURE 6

PHOTOS OF PERFORMANCE CENTERS (STUDY 4)

Performance center A	Performance center B (the focal center)	
No visitor	No visitor	A visitor in the photo
		

Results and Discussion

Preference for the focal performance center. In support of H1, participants' preference for the focal performance center (performance center B) was lower if a visitor was present in the photo of the focal performance center than if not (36.2% vs. 63.1%; $\chi 2(1) = 42.60$, $p < .001$).

Feelings of others' ownership of the focal performance center. As in the previous studies, we calculated participants' feelings of others' ownership of the focal performance center relative to the alternative performance center. In support of H2, the presence (vs. absence) of a visitor in the photo of the focal center increased participants' feelings of others' ownership of the focal center (*Ms* = 0.74 vs. 0.04, *SDs* = 1.39 vs. 1.15; $t(584) = -6.64$, $p < .001$, $d = 0.55$), which

mediated the effect of human presence on participants' preference for the focal performance center (b = 0.11, SE = 0.06, CI95% [0.02, 0.23]).

Alternative explanations. Similar to study 2, the focal performance center was perceived as more crowded if a visitor was present in the photo (M = 0.62, SD = 1.32) than if not (M = -0.04, SD = 1.39; t(584) = -5.89, p < .001, d = 0.49). However, the mediation analysis revealed that this did not mediate the effect of human presence in the photo on participant's preference for the performance center in the photo (b = -0.02, SE = 0.04, CI95% [-0.11, 0.07]). Moreover, the photo of the focal performance center was rated as more real if a human was present in the photo (M = 0.48, SD = 1.70) than if not (M = -0.23, SD = 1.36; t(584) = -5.63, p < .001, d = 0.47). This ruled out the difference in realism of the photo as a potential alternative explanation for the negative effect of human presence on participants' preference for the focal performance center.

Study 4 used an incentive compatible design and an experience venue of a performance center to replicate previous findings. The human presence in a photo decreased viewers' preference for the venue in the photo (H1) as viewers feel others' ownership of the venue (H2).

STUDY 5: CHOOSING A WEDDING VENUE FOR AN IDENTITY-RELEVANT (VS. LESS IDENTITY-RELEVANT) EXPERIENCE

Study 5 serves two purposes. First, we manipulate the identity-relevance of the experience and test whether identity-relevance moderates the main effect (H3). Second, this study addresses two potential alternative explanations.

Specifically, prior research shows the attractiveness of the model predicts the effectiveness of an advertisement (Kahle and Homer 1985). Therefore, one alternative account for H1 could be that the human in the photo is less attractive than the venue in the photo and thus lowers the viewer's preference for the venue. To address this, we conducted a pretest on Prolific to choose a wedding couple that would be equally attractive as both the focal wedding venue and the alternative wedding venue for this study (see web appendix H for details).

We also examined ease of self-imagery as a potential alternative explanation for the main effect. Specifically, prior research shows the presence (vs. absence) of a familiar human's face in the photo of a product makes it difficult for photo viewers to imagine themselves consuming the same product (Hartmann et al. 2021). Therefore, another potential alternative account for H1 could be that human presence in the photo of an experience venue makes it difficult for photo viewers to imagine themselves at the same venue. This study measured ease of self-imagery to address this alternative account.

Method

Three hundred and ninety-eight participants who were located in the USA or UK and spoke English as their first language on Prolific completed this study for a nominal payment. We obtained 327 valid responses (73% female, M_{age} = 40; one participant did not provide demographic information) after excluding responses that failed attention check questions.

This study adopted a 2 (type of experience: identity-relevant vs. less identity-relevant) x 2 (in the photo of the focal wedding venue: no couple vs. a couple) between-subject design. As in

the previous studies, participants were presented with photos of the two wedding venues (same venues and the couple with a happy pose as in study 3). We manipulated the content of the photo of the focal venue, while holding the photo of the alternative venue constant.

Participants who were randomly assigned to the identity-relevant condition imagined that "*You just got engaged. You are looking for a wedding venue now. You hope to have an unforgettable wedding experience at this venue."*

Participants who were randomly assigned to the less identity-relevant condition imagined that "*You are a wedding planner. A client just got engaged and is asking you to recommend a wedding venue now. They hope to have an unforgettable wedding experience at this venue."*

All participants imagined that there were two wedding venues for their consideration. These two venues were about the same distance from the city center and had the same capacity (i.e., could accommodate the same number of guests). Along with the scenario, all participants saw photos of the two wedding venues (venue A and venue B).

After looking at the photos, all participants indicated their preference between the two wedding venues, feelings of others' ownership of each venue (r for venue A = .72, r for venue B = .63; $ps < .001$), and ease of self-imagery ("I could easily picture myself at this wedding venue," "I had a vivid image of celebrating a wedding at this venue," "I was thinking about what it would be like to celebrate a wedding at this place," "I can personally relate to the place in this picture"; Cronbach's alpha for venue A = .93, venue B = .90; adapted from Hartmann et al. 2021).

For the manipulation check, participants also rated how much the wedding ceremony was relevant to their self-identity ("Do you think the wedding venue would communicate your self-

identity?") on a scale from 1 to 7 (1 = not at all, 7 = very much). Finally, all participants reported their gender and age.

Results and Discussion

Manipulation check. Participants in the identity-relevant condition (i.e., choosing for their own wedding) rated the wedding to be more relevant to their self-identity (M = 5.36, SD = 1.36) than participants in the less identity-relevant condition (i.e., choosing for a client's wedding) (M = 5.04, SD = 1.55; $F(1, 323) = 3.90$, $p = .049$, $\eta_p^2 = .01$) supporting the manipulation.

Preference for the focal wedding venue. In support of H1 and H3, in the identity-relevant condition, fewer participants preferred the focal wedding venue if there was a wedding couple in the photo than if not (30.9% vs. 46.3%; $\chi^2(1) = 4.80$, $p = .028$). But, in the less identity-relevant condition, the preference for the focal venue was the same whether there was a wedding couple in the photo or not (33.8% vs. 37.7%; $\chi^2(1) = 0.22$, $p = .64$).

Feelings of others' ownership of the focal wedding venue. As in previous studies, we calculated participants' feelings of others' ownership of the focal venue relative to the alternative venue, and then conducted a two-way ANOVA. Results revealed no main effect of the identity-relevance of the experience ($M_{relevant}$ = 1.60, SD = 1.81; $M_{less\text{-}relevant}$ = 1.73, SD = 1.81; $F(1, 323) = 0.58$, $p = .45$), no main effect of human presence in the photo ($M_{no\text{-}couple}$ = 1.54, SD = 1.83; $M_{a\text{-}couple}$ = 1.76, SD = 1.79; $F(1, 323) = 0.47$, $p = .50$), but a significant two-way interaction between the two ($F(1, 323) = 5.52$, $p = .019$, $\eta_p^2 = .02$). Specifically, in the identity-relevant condition, participants' feelings of others' ownership of the focal venue were stronger if there was a

wedding couple in the photo than if not ($M_{\text{no-couple}}$ = 1.29, SD = 1.86; $M_{\text{a-couple}}$ = 1.90, SD = 1.72; $t(190) = -2.38$, $p = .019$, $d = 0.34$), supporting H2. In the less identity-relevant condition, participants' feelings of others' ownership of the focal venue was the same across conditions ($M_{\text{no-couple}}$ = 1.92, SD = 1.73; $M_{\text{a-couple}}$ = 1.58, SD = 1.87; $t(133) = 1.08$, $p = .28$).

We conducted a moderated mediation analysis (PROCESS Model 7, 5000 bootstraps), treating the presence of a wedding couple in the photo of the focal venue (no couple = -0.5, a couple = 0.5) as the independent variable, feelings of others' ownership of the focal venue relative to the alternative venue as the mediator, the identity-relevance of the experience (less identity-relevant = -0.5, identity-relevant = 0.5) as the moderator, and preference for the focal venue as the dependent variable. The index of moderated mediation was significant (b = -0.50, SE = 0.23, CI95% [-1.01, -0.09]; there was a conditional indirect effect in the identity-relevant condition (b = -0.33, SE = 0.15, CI95% [-0.64, -0.05]), but not in the less identity-relevant condition (b = 0.18, SE = 0.17, CI95% [-0.15, 0.53]), supporting H3.

Alternative explanation. To examine whether ease of self-imagery accounted for the main findings, we calculated participants' ease of self-imagery of the focal venue relative to the alternative venue, and then conducted a two-way ANOVA on the relative ease of self-imagery. Results revealed no main effect of the identity-relevance of the experience (M_{relevant} = -0.66, SD = 2.32; $M_{\text{less-relevant}}$ = -0.70, SD = 2.32; $F(1, 323) = 0.04$, $p = .85$), no main effect of human presence in the photo ($M_{\text{no-couple}}$ = -0.47, SD = 2.31; $M_{\text{a-couple}}$ = -0.86, SD = 2.32; $F(1, 323) = 1.43$, $p = .23$), and no significant two-way interaction ($F(1, 323) = 2.67$, $p = .10$). Also, a moderated mediation analysis (PROCESS Model 7, 5000 bootstraps), treating ease of self-imagery of the focal venue relative to the alternative venue as a mediator, revealed that the index of moderated mediation was not significant (b = -2.01, SE = 1.36, CI95% [-4.94, 0.46])

Study 5 provides further evidence for the main hypothesis (H1) and its underlying process (H2). The results rule out relative attractiveness of the human to the venue in the photo as well as ease of self-imagery as potential alternative explanations of H1. This study also reveals an important boundary condition of the main hypothesis, namely, whether photo viewers are considering the venue for an identity-relevant experience or not (H3).

As a robustness check, we also conducted a study that manipulated the identity-relevance of the experience through extraordinariness (vs. ordinariness) of the experience. According to Bhattacharjee and Mogilner (2014), consumers view extraordinary experiences more identity-relevant than ordinary experiences. Therefore, the study manipulated the identity-relevance of a dining experience by telling participants they were choosing a restaurant for a romantic dining experience with their partner on their anniversary (vs. they were looking for a restaurant for a normal dinner out with their friend). The results are consistent with findings in the present main study and provide extra evidence for the moderating role of identity-relevance in the main hypothesis. See web appendix I for details.

STUDY 6. PRESENCE OF A PRIOR CUSTOTMER (VS. THE RESTAURANT OWNER) IN THE PHOTO OF A DINING RESTAURANT

Study 6 serves two purposes. First, it manipulates the identity of the human in the photo and tests whether the distinctiveness of the human in the photo moderates the main effect (H4). Second, this study examines whether perceived scarcity or uniqueness of the focal venue is an alternative explanation for the main effect. Prior research suggests that consumers avoid

consuming the same product as others because they perceive the product that others have no longer unique (e.g., Ariely and Levav 2000; Levav and Zhu 2009; Xu et al. 2012). Therefore, a potential alternative account for H1 could be that human presence in the photo of an experience venue makes the venue in the photo less unique or less scarce.

Method

Four hundred and fifty participants who were located in the US, spoke English as their first language, and had an approval rate above 95% on Prolific completed this study for a nominal payment. We obtained 420 participants (51% female, M_{age} = 45; three participants did not provide demographic information) after excluding responses that failed attention check questions.

This study adopted a 3-condition (in the photo of the focal restaurant: no person vs. a prior customer vs. the restaurant owner) between-subject design. All participants imagined that they were looking for a restaurant for a romantic dining experience with their partner on their anniversary and there were two restaurants for them to consider.

As in the previous studies, participants were presented with photos of the two restaurants (photos for this study are available from the authors upon request; see web appendix J for the pre-test for stimuli selection): one photo of restaurant A (the focal restaurant), the other of restaurant B (the alternative restaurant). We manipulated the content of the photo of the focal restaurant, while holding the photo of the alternative restaurant constant. Participants who were assigned to the "prior customer" condition were told that the person in the photo of restaurant A

was a previous customer of the restaurant, while those who were assigned to the "restaurant owner" condition were told that the person in the photo of restaurant A was the owner of restaurant. To avoid the confound of the different appearance of a customer (vs. the owner), we held the human the same in the "prior customer" condition and the "restaurant owner" condition.

After looking at the photos, all participants indicated their preference between the two restaurants, feelings of others' ownership of each restaurant (r for restaurant A = .86; r for restaurant B = .88; $ps < .001$), ease of self-imagery for each restaurant as in study 5 (α for restaurant A = .92; α for restaurant B = .92), perceived uniqueness ("Does this restaurant look unique to you?) and perceived scarcity of each restaurant ("Does this restaurant look scarce to you?") on a scale from 1 to 7 (1 = strongly disagree, 7 = strongly agree). Finally, participants reported their gender and age.

Results and Discussion

Manipulation check. In a post study, we recruited 150 participants from Prolific and received 147 valid responses after excluding participants who failed an attention check question (48% female, $M_{age} = 44$; one participant did not provide gender information) for a nominal payment. All participants saw the same cover story as in the main study and saw the person in the photo of the focal restaurant. They were randomly assigned to two groups: one group were told the person in the photo was a prior customer of the restaurant; the other group were told the person in the photo was the owner of the restaurant. All participants answered whether they perceived the human in the photo to be distinct from them (1 = strongly disagree, 7 = strongly

agree). In support of the manipulation, "the owner of the restaurant" was perceived as a more distinctive identity than "a prior customer of the restaurant" (*Ms* = 5.38 vs. 4.70, *SDs* = 1.59 vs. 1.90; $t(145) = -2.36$, $p = .020$, $d = 0.39$).

Preference for the focal restaurant. A one-way ANOVA on the preference for the focal restaurant revealed a significant main effect ($F(2, 417) = 6.03$, $p = .003$, $\eta_p^2 = .03$). In support of H1 and H4, the preference for the focal restaurant was lower if a prior customer was present in the photo of the restaurant ($M = 3.99$, $SD = 1.73$) than if the restaurant owner was present in the photo ($M = 4.43$, $SD = 1.25$; $t(417) = 2.38$, $p = .018$, $d = 0.29$) or if no human was present in the photo ($M = 4.61$, $SD = 1.53$; $t(417) = -3.41$, $p = .001$, $d = 0.38$). There was no significant difference between the two latter conditions ($t(417) = -1.05$, $p = .30$).

Feelings of others' ownership of the focal restaurant. A one-way ANOVA on participants' feelings of others' ownership of the focal restaurant (relative to the alternative restaurant) revealed a significant effect of human presence ($F(2, 417) = 40.90$, $p < .001$, $\eta_p^2 = .16$). As expected, compared to when no person was present in the photo ($M = 0.09$, $SD = 1.28$), participants reported stronger feelings of others' ownership of the focal restaurant when a prior customer ($M = 1.79$, $SD = 2.04$; $t(417) = 7.20$, $p < .001$, $d = 1.00$) or the restaurant owner ($M = 1.98$, $SD = 2.39$; $t(417) = 8.26$, $p < .001$, $d = 0.99$) was present in the photo. There was no significant difference between the two latter conditions ($t(417) = 0.80$, $p = .42$).

For the mediation analysis, following Hayes (2013), we first constructed two dummy variables, X1 representing the "prior customer" condition (coded as 1 if yes, as 0 otherwise) and X2 representing the "restaurant owner" condition (coded as 1 if yes, as 0 otherwise). We then ran a mediation analysis (PROCESS Model 4, 5000 bootstraps), treating X1 (no person vs. a previous customer) as the independent variable, feelings of others' ownership of the focal

restaurant relative to the alternative restaurant as the mediator, preference for the focal restaurant as the dependent variable, and X2 (no person vs. the restaurant owner) as the covariate. In support of H2, we found a significant indirect effect through feelings of others' ownership of the focal restaurant (b = -0.18, SE = 0.08, CI95% [-0.33, -0.03]).

Alternative explanations. As in the previous studies, we calculated the relative score of ease of self-imagery, perceived scarcity and perceived uniqueness of the focal restaurant (relative to the alternative restaurant). A one-way ANOVA revealed that there was no significant difference across conditions in terms of the relative ease of self-imagery ($M_{\text{no-person}}$ = 0.30, SD = 1.58 vs. $M_{customer}$= 0.004, SD = 1.84 vs. M_{owner} = 0.16, SD = 1.63; $F(2,417) = 1.04$, $p = .35$) or relative scarcity of the focal restaurant ($M_{\text{no-person}}$ = 0.12, SD = 1.38 vs. $M_{customer}$ = -0.20, SD = 1.69 vs. M_{owner} = 0.06, SD = 1.25; $F(2,417) = 1.84$, $p = .16$). These results ruled out ease of self-imagery and scarcity as potential alternative explanations of H1.

There was a marginally significant main effect of human presence on the relative uniqueness of the focal restaurant ($M_{\text{no-person}}$ = 0.44, SD = 1.59 vs. $M_{customer}$ = 0.13, SD = 1.49 vs. M_{owner} = 0.54, SD = 1.42; $F(2,417) = 2.70$, $p = .068$, $\eta_p^2 = .01$). However, the mediation analysis, treating X1 as the independent variable, perceived uniqueness of the focal restaurant relative to the alternative restaurant as the mediator, preference for the focal restaurant as the dependent variable, and X2 as the covariate, revealed no mediation by perceived uniqueness of the restaurant (b = -0.13, SE = 0.08, CI95% [-0.29, 0.03]). These results further demonstrated feelings of others' ownership as the focal driver of H1.

Study 6 provides additional support for the main hypothesis (H1) and the proposed mechanism (H2). The results also suggest a managerially relevant moderator for marketers to turn off the negative effect of human presence in online photos, namely, including a human with

a distinctive identity (e.g., the owner or employee of the venue) that does not compete with photo viewers for the identity that photo viewers expect from the ownership of the venue (H4).

In additional analyses, we found that, in Studies 2, 4 and 6, holding gender of the human in the photo (if any) constant as male, gender of the photo viewer did not moderate the negative effect of human presence in any of these studies. See web appendix K for detailed results. At first sight, this finding seems to be inconsistent with H4 and the main findings of Study 6, because having a different gender from the human in the photo might be able to serve as a distinction of self-identity for photo viewers and thus mitigate the negative human presence effect. However, the post-study of Study 6 (as described in the "manipulation check" paragraph) revealed that, non-male photo viewers did not perceive the male human in the photo as more distinct from themselves than male photo viewers did (M_{match} = 4.94, SD = 1.68 vs. $M_{mismatch}$ = 5.12, SD = 1.87; $t(144) = 0.60$, $p = .55$). This lent indirect support to H4 as it highlights the importance for the photo viewer to perceive the human in the photo as distinct from themselves in order to turn off the negative human presence effect. Future research may further investigate when the difference of gender would serve as a stronger distinction of self-identity.

GENERAL DISCUSSION

As self-identity is a fundamental human need (Berger and Heath 2007; Escalas 2013; Grewal et al. 2019; Kleine et al. 1995) and consumers often use their ownership of something to construct and communicate their self-identity (Belk 1988; Grubb and Grathwohl 1967; Pierce and Peck 2018), the present research furthers our understanding of how human presence in

shared photos impact photo viewers' responses by incorporating photo viewers' need for self-identity and their feelings of others' ownership into their response process. Across a field study of 14,725 travel photos on Instagram and five controlled experiments, we find that the presence (vs. absence) of another human in the photo of an experience venue can decrease the photo viewers' liking and preference for the venue. We show that the negative effect of human presence in the photo is mediated by photo viewers' feelings of others' ownership of the venue in the photo (studies 2, 3, 4, 5 and 6). We also identify two important theoretical moderators in the present paper: First, the negative effect of human presence in the photo holds only when the photo viewers are seeking an identity-relevant experience from the venue (study 5), and the effect is mitigated when the human in the photo has a distinctive identity and thus does not compete with photo viewers for the same identity (study 6).

Theoretical Contribution and Practical Implications

The present research makes several theoretical contributions. First, the findings extend the current understanding of psychological ownership from "the feeling that something is MINE" (see Peck and Luangrath 2023 for a review) to "the feeling that something is THEIRS." Although prior research has identified various factors that influence "the feeling that something is MINE," our work is the first to empirically show that the presence of another human in the photo of a venue can lead to photo viewers' feelings of others' ownership of the venue (i.e., the feeling that the venue is THEIRS), which can lower photo viewers' liking and preference for the venue.

Second, the findings advance the current understanding of imagery marketing (e.g., Escalas 2004; Jiang et al. 2014; Krishnamurthy and Sujan 1999; Petrova and Cialdini 2005; To and Patrick 2021). In particular, Krishnamurthy and Sujan (1999) found that providing more *contextual information* (e.g., objects that typically surround a tropical vacation spot) in an ad helps consumers form consumption visions and increases ad effectiveness. Our work distinguishes *human presence* from other contextual information and shows when and why human presence in a contextually detailed ad could decrease ad effectiveness. Moreover, recently, To and Patrick (2021) reveal that the presence of a human with an averted (vs. direct) gaze in the ad facilitates narrative transportation and increases ad effectiveness. Our work complements these findings by showing when and why the mere presence (vs. absence) of a human in the ad, *regardless of their direction of gaze*, decreases ad effectiveness.

Lastly, our work adds to the growing body of literature on how human presence in social media images impact viewers' responses. Specifically, while existing literature examines this question from perspectives of attention (Bakhshi et al. 2014; Li and Xie 2020), ease of self-imagery (Hartmann et al. 2021), and social proof (Poor et al. 2013), we investigate this question through the lens of psychological ownership and the identity-signaling function of ownership (Escalas 2013; Grewal et al. 2019; Kleine et al. 1995). We propose multiple overlooked factors (identity-relevance, interpersonal distinction) that identify the boundary conditions or moderators of the negative effect of human presence.

The present research also provides important practical implications. First, as consumers are increasingly likely to share photos of their personal experiences on social media (Carter and Gilovich 2012; Diehl et al. 2016; Hu et al. 2014; Kumar and Gilovich 2015; Valsesia and Diehl 2022) and prior research suggests marketers should encourage consumers to show themselves in

the photos (e.g., Bakhshi et al. 2014; Poor et al. 2013), our findings caution marketers that the presence of prior customers in online photos of identity-relevant experiences can lower other consumers' likelihood of choosing the places or venues in the photos. Meanwhile, our work shows marketers how to mitigate the negative effect. Specifically, study 6 suggests marketers can include a human in the photo who does not compete with photo viewers for the same identity, such as an employee or owner of the venue. We found this would not hurt new customers' interest in the venue in the photo. This finding also complements recent research that shows including a photo of the employee on a service company's website can increase prior customers' perception of the company's service quality (Herhausen et al. 2020). Finally, as recent research demonstrates that the content of photos should match the content of words in online reviews (Ceylan, Diehl, and Proserpio 2023), our work shows that, even when the content of a photo matches the word description, the content of the photo should also match the photo viewer's need in identity-relevant consumption. Specifically, marketers should still be cautious about the presence of prior customers in online photos of identity-relevant experiences.

Future Research

We wish to suggest some directions for future research. First, in the current studies, the distance between the human in the photo and the photo viewer was ambiguous. According to prior research, people tend to perceive a distant (vs. close) other more abstractly (Trope and Liberman 2011) and less identity-threatening (Ordabayeva, Cavanaugh, and Dahl 2022). Therefore, it is possible that the negative effect of human presence on photo viewers' preference

is attenuated when photo viewers perceive the human in the photo as distant from (vs. close to) themselves. In one study, we manipulated the photo viewer's perceived distance from the human in the photo and found evidence supporting this conjecture (preference for the focal venue: *Ms* = 3.20 vs. 3.88 vs. 3.98 in the close other vs. distant other vs. no other conditions; see web appendix L). Since people often conflate spatial distance with social or temporal distance (Liberman, Trope, and Stephan 2007), it could generate interesting results to study how different types of psychological distance moderate the human presence effect. The results would have broad implications for consumer well-being, as consumers may choose how to share photos of their experiences (with or without themselves in the photos) depending on whether they want to encourage their networks to go to the same venue and how close they are with these networks.

Second, in the current studies, we assumed photo viewers' need for self-identity was strong enough so that the presence of another human in the photo of an identity-relevant experience would lower their interest in the venue in the photo. What if photo viewers do not have a strong need for self-identity? In one study, we manipulated the relative strength of the need for self-identity (vs. need for social belonging) by inducing photo viewers' loneliness and found that the negative effect of human presence in the photo was attenuated when photo viewers' need for self-identity was less prominent (see web appendix M). As research on loneliness is growing (see Shrum, Fumagalli, and Lowrey 2023 for a review), we think it would be meaningful to examine the interaction between loneliness and the human presence effect.

A third research question that may be worth further examination is whether our effect applies to material consumption. In the current studies, we focused on photos of experience venues because experiential consumption is more self-signaling than material consumption (Belk 1989; Carter and Gilovich 2012; Zauberman et al. 2009) and consumers are more likely to post

photos of their experiences than photos of their material possessions on social media (Hu et al. 2014; Kumar and Gilovich 2015). However, consumers and marketers do post numerous photos of physical products on social media. Will the presence of a human in the photo of a physical product impact the photo viewers' attitudes toward the product? Prior research suggests it might depend on whether the product is seen as symbolic of one's self-identity (Berger and Heath 2007). If a product is not seen as symbolic of one's self-identity (e.g., burger, candy, cereal, as in Hartmann et al. 2021), seeing photos of a person consuming the product might increase their evaluation of the product (Poor et al. 2013). However, if a product is self-signaling (e.g., limited-edition cars or sneakers, as illustrated in Berger 2014), seeing photos of a person signaling or implying their ownership of the product might hurt the photo viewers' interest in owning the product. Purchasing a home as a primary residence seems to be a context where this effect manifests. Realtor authorities such as Zillow assert to home sellers that removing family photos and personal items and generally depersonalizing a home in listing photos and in person is important to sell the house. Our work reveals that in some cases, viewers perceive others' traces as a threat to their ownership and self-identity.

DATA COLLECTION STATEMENT

The first author collected the data for study 1 from Instagram and analyzed the data in the autumn of 2021. The second author collected the data for study 4 in the winter of 2022 and the data for the supplementary study in web appendix F in the spring of 2023 at University of Wisconsin, Madison. The second author collected the data for the pretest of study 6 from Prolific in the spring of 2022, and collected the data for the post-test of study 6 and the data for the post-test in web appendix A from Prolific in the summer of 2023. The first author collected the data for the post-test of study 1 from Mechanical Turk in the summer of 2022, and the data for all other studies from Prolific from the spring of 2022 to the spring of 2023. The second author analyzed these data. The data are currently stored in a project directory on the Open Science Framework: https://osf.io/z5yq4/?view_only=3dae035857194250ac71ab5da3e1af99.

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