

# From Sweetheart to Scapegoat: Brand Selfie-Taking Shapes Consumer Behavior

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**FROM SWEETHEART TO SCAPEGOAT:  
BRAND SELFIE-TAKING SHAPES CONSUMER BEHAVIOR**

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Increasingly, consumers are taking self-photos and marketers, eager to capitalize on this trend, have been asking consumers to take self-photos with brands (i.e., brand selfies). We suggest that consumer compliance with such requests sparks a self-inferential process that leads the consumer to feel connected to the brand (e.g., “If I took the brand selfie, I must feel connected to this brand”), increasing brand preference. Eight studies support this account. In a dataset of 283,140 user reviews from Yelp, study 1 documented a positive association between a reviewer’s propensity to take a brand selfie and the star rating he gives the restaurant. Seven experiments point to causality: participants randomized to take brand selfies felt greater self-brand connection and exhibited heightened brand preference, relative to those randomized to take: no photo at all (study 2a), a selfie (without the brand; studies 2b-6), or a photo of the brand (without the self; study 3). Two studies point to process in convergent ways, via serial mediation (study 4) and moderated mediation (study 5). A final study documented a crucial moderator: dissatisfaction with one’s appearance in the selfie triggers defensive processing, reducing self-inference and thereby, the capacity for brand selfie-taking to increase brand preference.

*Keywords:* brand selfie, photo-taking, self-perception, self-inferences, self-brand connection.

In 1839 American, lamp manufacturer Robert Cornelius did something that no one had done before: he made a daguerreotype of himself (figure 1: Scottie and Ries, 2019). Translation: he took a selfie. Little did Cornelius know that some 150+ years later, the practice would become commonplace (if not also emblematic of modern day narcissism)—a trend catalyzed by Apple’s release of an iPhone with a front-facing camera in 2010 (Day 2013) and named Oxford dictionary’s “2013 word of the year.” By 2018, most (62%) Americans had taken selfies (YouGov 2018), with millennials being particularly likely to do so. According to one estimate, the average millennial will take over 25,000 selfies in her lifetime (Glum 2015).

For their part, marketers have been increasingly incorporating consumer selfie-taking into their digital branding efforts (Grewal, Stephen, and Coleman 2019). Marketers routinely encourage consumers to take “brand-selfies”—self-photos with a brand logo or product from that brand in tow. A common way of promoting brand-selfies is to enhance the visual appearance of a brand or product display—to make it something that people want to capture and share on their social media—to, in other words, make it “Instagrammable” (a term that has also recently been added to the dictionary; Merriam-Webster 2020). For example, soap supplier Baylyne installed an attention-grabbing selfie wall with soaps in the form of donuts in London’s Camden market (Instagram 2019). Many brands also seem to encourage selfie-taking with digital “brand lenses” embedded into mobile apps such as Snapchat and Instagram. Taco Bell’s Cinco de Mayo Snapchat lens for example, used by more than 200 million customers, transforms consumers’ heads into tacos (Johnson 2016). For its part, the online rating platform Yelp encourages consumers to take selfies at the restaurants they frequent, via the app’s “Yelfie” functionality (Lai 2016). Firms also directly incentivize consumers to take brand selfies through contests. Dunkin Donuts, for example, features a brand selfie “Fan of the Week” on its Facebook page

(Gioglio 2011; figure 1) and the fashion label Forever 21 rewards the best brand selfies taken and uploaded on Instagram with gift cards (FOREVER21 2017).

FIGURE 1—FIRST SELFIE TAKEN (1839) VS. BRAND SELFIE (2017)



Note: Lee 2020; Waxman 2017.

Why are marketers so keen to prompt consumers to take brand selfies? Probably because they expect those consumers to *share* the selfies, and so hope to promote word-of-mouth marketing, and, ideally, virality. However, the vast majority of selfies are not, in fact, shared with others. Indeed, in a pilot study of 191 US Americans, we found that the average iPhone user had 253 selfies on her phone but had only shared 16.2% of them on social media.<sup>1</sup> It seems that although consumers commonly take selfies, they only share a small proportion of them.

Despite the pervasiveness of selfie-taking, and marketers' attempts to promote brand selfie-taking in particular, little is known about the effect of this behavior on the selfie-takers themselves. Therefore, in this paper, we test the effect of brand selfie-taking on consumer

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<sup>1</sup> We asked 191 US American iPhone users on Amazon Mechanical Turk (subsequently MTurk;  $M_{age} = 32.70$ ,  $SD = 8.20$ , 45.03% female) how many photos and selfies they have on their phone and how many of the selfies they shared on a social media site or via an instant messaging app. On average participants indicated having 2,178.29 photos ( $SD = 6,363.34$ ) and 252.80 selfies (18.18%,  $SD = .279$ ) on their phones. However, they only shared 16.2% ( $SD = .22$ ) of them on social media sites and 4.6% ( $SD = .06$ ) via instant messaging apps (for more details see web appendix A).

behavior. Specifically, we develop and test a conceptual account for when, why, and how, brand selfie-taking affects consumers' preference for a given brand. Drawing on self-perception theory, we suggest that consumer compliance with a marketer's request to take a brand selfie sparks a self-inferential process that leads the consumer to feel connected to the brand (e.g., "If I took the brand selfie, I must feel connected to this brand"), which can increase brand preference. We also test a crucial moderator of this inferential process, positing that it is suppressed when the consumer is dissatisfied with her appearance in the selfie (in such cases, we propose, the consumer engages in a kind of defensive processing, projecting his dissatisfaction with his photo onto the brand). Next, we delineate the theoretical basis for these predictions, and discuss how we contribute to existing consumer behavior literatures. We conclude this introduction with an overview of our empirical package.

## **THEORETICAL DEVELOPMENT**

Prior work in social psychology and allied fields points to the conclusion that people do not simply *know* who they are—their attitudes, beliefs, and preferences—rather, their self-views are sometimes constructed by external cues. In particular, self-perception theory holds that people have a tendency to infer *who they are* by looking to their behavior—and that they are particularly likely to make such self-inferences when they lack strong attitudes or preferences to begin with (Bem 1967; Chaiken and Baldwin 1981; Fazio, Zanna, and Cooper 1977). Of particular relevance to our investigation, the theory implies that people make such inferences even when unwarranted—when their behavior is determined entirely by situational factors (e.g., by an induction to take a brand selfie, as we explore here). Self-perception theory has been useful

in explaining many consumer behavioral phenomena and transfers to the digital context (e.g., Grewal, Hmurovic, et al. 2019; Summers, Smith, and Reczek 2016). For example, consumers report their personalities as being similar to that of a given brand after having been assigned to use that brand (Park and John 2010), and their opinions to be more aligned with that of a targeted online advertisement (Summers et al. 2016).

In a similar vein, people make inferences about their social relationships based on how they interact with others. Spouses, for example, sometimes perceive their caring behavior as evidence of a strong bond for each other (Harvey and Omarzu 2006). Research on a variety of shared activities (e.g., dancing, marching, singing, acting) suggests that engaging in coordinated movements makes people feel a sense of connection to each other (Dong, Dai, and Wyer 2015; Weinstein et al. 2016; Wolf, Launay and Dunbar 2016). Relatedly, Xu, Shen and Wyer (2012) found that people draw inferences about their affiliation with others from physical proximity, which in turn affects the brands they choose.

Akin to the sense of closeness that people derive from shared activities, the consumer behavior literature offers several hints that consumers, too, can feel more connected to a brand as a result of a joint experience with brands (Brakus, Schmitt, and Zarantonello 2009). For example, increasing proximity to a product, by hugging it (Hadi and Valenzuela 2014), or even simply imagining pulling a product closer to the self (Labroo and Nielsen 2010), can affect consumers' liking of, and connection to, the given product. Building on these findings, we propose that taking a self-photo together with a brand can trigger self-inferences that increase self-brand connection.

Prior work in consumer behavior indicates that, in turn, feeling connected or attached to a brand can foster positive behaviors toward the given brand. For example, strong self-brand

connections are associated with customer loyalty (Huang, Huang, and Wyer 2018; Lam et al. 2010; Wang and John 2019) and consumers who feel highly connected to a brand are more resilient to negative information about the brand (Ferraro, Kirmani, and Matherly 2013). Moreover, and of particular relevance to the current investigation, prior scholars have found that feeling connected to a brand may spur purchase of that brand. For example, Whan Park et al. (2010) observed that consumers' sense of connectedness to a brand predicts purchase intention and willingness to pay better than brand attitudes alone. Consistent with this finding, brand attachment predicts purchase intention (Schroll, Schnurr, and Grewal 2018), as well as a willingness to pay a price premium (Jiménez and Voss 2014).

In sum, we predict that brand selfie-taking increases consumers' preference for the brand (which we operationalize in a variety of ways: product choice, purchase intention, ratings in reviews). Complying with a request to take a brand selfie, we posit, sparks a self-inferential process that leads the selfie-taker to feel more connected to the brand. In turn, we posit this enhanced self-brand connection to increase brand preference (see figure 2). Specifically, we hypothesize:

- H1:** Taking a brand selfie can increase preference for that brand.
- H2:** The effect of brand selfie-taking on brand preference is serially mediated by self-inferences, followed by heightened self-brand connection.

What factors might disrupt this inferential process? We posit dissatisfaction with one's appearance in the brand selfie as one such factor. In such cases, we propose that consumers use the brand as a *scapegoat*, essentially projecting their dissatisfaction with their own appearance



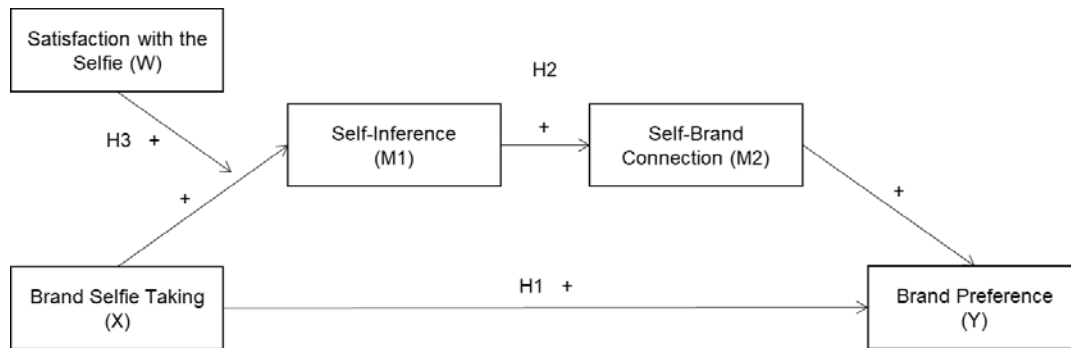
onto the brand. This might block the self-inferential process, leaving the consumer dissatisfied with the brand (but leaving their self-image more or less intact). Long-recognized attribution theories (Festinger 1957; Heider 1958), have shown considerable evidence that when people encounter threatening information (e.g., information that is incongruent with one's core beliefs, or even simply unwelcome information such as news of a loved one's illness), they engage in defensive processing (e.g., Kunda 1990; Swann 1983). Such processing can take a variety of forms. For example, people may dismiss such information as invalid or irrelevant (Ditto et al. 1998; Liberman and Chaiken 1992), or they may engage in psychological reactance (Dutton and Lake 1973). Such defensive processing has been documented in consumer behavioral contexts, too. For example, consumers have been found to avoid products that harm their self-view (Grewal, Hmurovic et al. 2019), and to seek products that bolster it (Gao, Wheeler, and Shiv 2008; Rucker and Galinsky 2008). Relatedly, defensive processing has been invoked to account for consumers' responses to advertising and persuasive messages (Agrawal and Duhachek 2010; Darke and Ritchie 2007).

Of particular relevance to the present investigation, people have also been found to cope with the discomfort arising from encountering threatening information by ascribing blame to targets associated, if only superficially, with that information (Baumeister 1991; Frankl 1963; Heider 1958; Kanazawa 1992; Kelley 1973; McArthur 1972; Ross 1977; Taylor 1983; Park and Cohen 1992). For example, people cope with unwanted information (e.g., news that they have tested positive for a disease) by blaming innocent messengers that convey this news. In one study for example, when a messenger informed participants that they had lost a lottery—a chance event—participants believed that messenger to have “willed” the event to occur (John, Blunden, and Liu 2019). Such processes have also been documented within consumer behavioral

phenomena, as when consumers ascribe blame to brands, as opposed to themselves, when they encounter negative outcomes (Wiggin and Yalch 2015). In sum, we posit that when a consumer encounters a less-than-stellar image of herself in a brand selfie, instead of revising her impression of her own attractiveness (downward)—a threatening undertaking because it could be damaging for the ego—she may instead use the brand as a *scapegoat*, projecting her personal dissatisfaction onto the brand (see figure 2). Specifically, we hypothesize:

- H3:** Dissatisfaction with one’s selfie blocks the self-inferential process identified in H2, thereby moderating the effect of brand self-taking on brand preference.

FIGURE 2—CONCEPTUAL FRAMEWORK



### CONTRIBUTION TO THE LITERATURE

In testing these hypotheses, we contribute to the literatures on brand relationship formation, consumer photo-taking experiences, and branded user-generated content.

## Consumer-brand connectedness

The literature on consumer brand relationships is extensive (Fournier, 1998; for a review of this area, see Fetscherin and Heinrich 2015). Of particular relevance to the current investigation, prior work has identified a number of factors that affect whether consumers form bonds with brands, and the psychological processes that underlie such phenomena. Some of this work has looked at how (trait) characteristics of both the consumer and the brand predict whether consumers form connections with that brand. For example, Malär et al. (2011) show that congruence between a brand's personality and the consumer's actual (as opposed to ideal) personality, positively predicts brand attachment. Further, consumers' self-esteem and public self-consciousness seem to strengthen this relationship.

Of even greater relevance to the current investigation, other work is consistent with a premise of the present investigation, namely that self-brand connections can, at least in part, be constructed by situational factors. For example, Huang et al. (2017) show that social crowding (e.g., shopping in a crowded mall) induces a need to belong, in turn heightening consumers' motivation, as well as propensity, to become attached to the brand. And, attesting to the mind's role in actively constructing such bonds, and the psychological functions that possessions can play more generally (Belk 1988; Levy 1959; McCracken 1988), prior work suggests that consumers sometimes use brands to actively construct their self-concepts (e.g., Bodner and Prelec 2003; Dhar and Wertenbroch 2012; Escalas and Bettman 2005; Gao et al. 2008; Grewal, Hmurovic, et al. 2019; Rucker and Galinsky 2008; Trudel et al. 2018; Townsend and Shu 2010). Doing so, in turn, can increase the sense of connection that consumers feel with those brands. Consistent with these ideas, Escalas and Bettman (2005) showed that brands used by a given consumer's ingroup are particularly likely to enhance that consumer's self-brand connection

(presumably because purchasing such brands fulfill the consumer's desire to construct an identity consistent with that of her ingroup).

We contribute to this literature by studying a novel process by which self-brand connections may be constructed: self-inferences generated by taking a selfie with the brand. In doing so, we heed Schmitt's (2013) call for more research on how consumers' experiences and interactions with brands affect the relationships they form with those brands.

#### User-generated content and consumer photo-taking

In focusing on how such self-inferential processes are triggered by the increasingly common activity of brand selfie-taking, we also contribute to both the literatures on user-generated content, as well as that on consumer photo-taking experiences.

*User-generated content.* Some of this work has explored factors that affect the nature of the content created (Chen 2017; Melumad, Inman, and Pham 2019). Of particular relevance to the present investigation, other work has explored how content generation may affect consumers' attitudes and behaviors toward a brand. For example, Moore (2012) found that consumers' use of explanatory language (e.g., using words such as "because," "think," and "realize") in product reviews predicts the positivity of the review, as well as purchase intention. As another example, Tirunillai and Tellis (2012) found a positive association between user-generated content and stock performance. Moreover, Manchanda, Packard, and Patabhiraiah (2015), using a difference-in-differences approach to allow for causal inference, found that posting content on a brand's social network increased purchases from that brand. Yet inducing consumers to engage in a less effortful form of engagement—clicking a Facebook "like" button—neither increases

purchasing nor positively shapes brand attitudes; in fact, doing so can even backfire (John et al. 2017; Kristofferson, White, and Peloza 2014).

We contribute to this literature by exploring how a novel form of user-generated content—brand selfie-taking—affects consumers' behavior toward the brand. However, given the prior work suggesting that low effort engagement may be limited in shaping consumer attitudes, why would we expect brand selfie-taking to foster feelings of connectedness? After all, brand selfie-taking may be a similarly low-effort form of engagement (one need simply click a button to snap a photo). Here, we draw on the burgeoning literature on the profound effects that photo-taking can have on the photo-takers themselves.

*Consumer photo-taking experiences.* Prior work has explored how photo-taking shapes consumers' ability to remember experiences, as well as their enjoyment of those experiences. Specifically, Barasch et al. (2017) found that photo-taking leads to a shift of attention, toward the visual and away from the auditory aspects of an experience. As a result, photo-takers remember things that they saw better than things that they heard. As for how photo-taking affects the enjoyment of an experience, Diehl, Zauberger, and Barasch (2016) found that photo-taking can increase enjoyment, but also identified important boundary conditions. For example, and of particular relevance to the present investigation, taking photos with the goal of sharing them can decrease enjoyment, by evoking self-presentational concerns (Barasch, Zauberger, and Diehl 2018). By exploring the effect of brand selfie-taking behavior in a context in which consumers are explicitly *not* intending to share their photos, we hoped to reduce the possibility of adverse effects (though, as we note in the General Discussion section, we think this would be an

interesting area for future research to explore—how *sharing* a brand selfie might impact the selfie-taker, and, in turn, recipients or viewers of that photo).

As in this prior work, we also explore the effects of photo-taking on the photo-taker herself. However, while this prior work focuses on the effect of photo-taking on a photo-taker's enjoyment of the experience, we focus on the relational effects of this activity. Specifically, we explore how brand selfie-taking affects the selfie taker's sense of connection toward the brand. Accordingly, whereas prior research on consumer photo-taking has tended to compare the impact of taking—versus not taking—photos on consumer attitudes and behaviors, we explore the impact of taking a (self) photo with—versus without—the brand on consumer behavior toward that brand.

## **OVERVIEW OF EMPIRICAL PACKAGE**

We offer eight studies to support this account. In a dataset of 283,140 user reviews from Yelp, study 1 tests for a positive association between a reviewer's propensity to take a brand selfie and the star rating he gives to that restaurant. Then, in seven experiments, we test for causality. Specifically, we test whether participants randomized to take brand selfies feel more connected to the brand, and exhibit heightened brand preference, relative to those randomized to take: no photo at all (study 2a), a selfie (without the brand; studies 2b-6), or a photo of the brand (without the self; study 3). We test for process evidence in two convergent ways, via serial mediation (study 4) and moderated mediation (study 5). Study 6 tests a theoretically-driven moderator, testing the notion that dissatisfaction with one's appearance in the selfie triggers

defensive processing, reducing self-inference and thereby, the capacity for brand selfie-taking to increase brand preference.

Importantly, in our experiments we *randomly induce* participants to take different kinds of photos; compliance rates were high and typically equivalent across experimental conditions. Nonetheless, we adopt a conservative, intent-to-treat approach to data analysis, whereby all participants were included in the analysis regardless of whether they complied with the request to take a selfie. These features of our experimental design and analysis are crucial to testing the causal effect of brand selfie-taking on brand outcomes (otherwise, the results could simply be a product of selection, or selection-by-treatment interactions; see John et al. 2017 for a discussion of this issue). In addition, we note that our findings are robust to different photo-taking devices (smartphone vs. webcam), and to different brands (known vs. unknown; real vs. made-up).

Following recent thinking on sample sizes (Simmons 2014), for online studies—where data collection was relatively quick and inexpensive, we targeted a minimum of 100 participants per condition. In our lab study (study 2b), we sought to obtain 50 participants per condition. We report all manipulations and measures and, following standards of purchase intention studies (e.g., Ding 2007) we prescreened individuals for basic product category interest.

## **STUDY 1: YELFIES**

Study 1 is a correlational study in which we used publically available data from the restaurant review platform Yelp. We tested whether reviewers' posting of a brand selfie is positively correlated with the star rating they gave the restaurant. We also included a variety of controls to explore whether the correlation may be causal in nature. That said, given the

correlational nature of the data, we cannot and do not claim causality in this study. We reserve such claims for studies 2-6, which are randomized experiments.

## Method

*Dataset.* We used review data from the restaurant review platform Yelp. This is a public website; all reviews are publically available and can be analyzed for non-commercial purposes.<sup>2</sup> We downloaded reviews for restaurants located within New York City posted between 1/1/2014 and 1/9/2020. Then, for each Yelp user in the dataset, we also collected all other restaurant reviews from other locations that the given user had posted within that timeframe. We removed any reviews that did not contain a user-posted photo, leaving us with a master dataset of 283,140 reviews, covering 155,784 unique restaurants, written by 12,034 unique Yelp users (average # of reviews per unique user in our dataset = 23.53, SD = 62.13, min = 1, max = 1,801), each of which contained at least one user-posted photo ( $M$  # of photos posted per review = 3.05, SD = 2.76).

*Independent variable classification procedures.* Using a combination of human coding and machine-learning techniques, we classified whether or not each photo in the dataset was a brand selfie. First, we selected 92 Yelp users from outside of our master dataset and downloaded all of their reviews. Collectively, these 92 reviewers had posted 3,151 reviews, which contained a total of 13,713 user-posted photos. Two research assistants independently coded whether each of these 13,713 photos was a selfie—there are tell-tale signs of selfies (e.g., the camera angle, a portion of the selfie taker’s arm visible in the photo) that are easily detected by human coders.

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<sup>2</sup> Terms for the non-commercial use of Yelp data are here: [https://www.yelp.com/developers/api\\_terms](https://www.yelp.com/developers/api_terms) (retrieved February 8, 2020).



Indeed, agreement between these two research assistants was high ( $\alpha = .90$ ,  $\kappa = .81$ ).

Inconsistencies were resolved by a third rater.

Note that here, we assume that all selfies represent *brand* selfies. Given the context of the selfie—the selfies were posted as part of a restaurant review—we surmised that any selfie likely represented a *brand* selfie, in the sense that it was likely to have been taken in the restaurant itself. Of course, some of these selfies may be “stronger” brand selfies, in that they may feature the brand more prominently—e.g., by having the restaurant logo or signage visible within the selfie; whereas others may be “weaker” brand selfies (e.g., selfies taken while at the restaurant, but without prominently featuring the restaurant’s logo or name). We suspect that the existence of the latter, subtler type in our dataset would have only made it harder for us to detect effects. Note also that here, our operationalization of selfie allows for the possibility that there could be more than one person in the photo—as long as the photo was taken by someone in the photo, we counted it as a selfie. Finally, note that we assumed that the selfie-taker was in fact the user providing the review. Of course, it is possible that a user may have posted a selfie sent to him by a friend; however, we think it much more plausible that selfies posted by a given user were in fact taken by the given user (and thus feature the given user in the photo). However, to the extent that this occurred, as with the presence of *weaker* brand selfies in our dataset, we think it likely to have only made it harder for us to detect effects.

Because it would be impractical to have human coders code the 862,154 photos in our master dataset (we felt badly enough asking our research assistants to code 13,713 photos!), we turned to machine learning techniques to categorize each remaining photo as either a selfie or not a selfie. To do so, we fed the training dataset into a state-of-the-art convolutional deep neural network (CNN, Google InceptionV3), and trained the network to predict the probability that each

photo was a selfie. Thus, for each photo, we obtained a probability estimate, representing the probability that the given photo represented a selfie ( $selfie = 1$ ) or not ( $selfie = 0$ ). Full details of this procedure are in web appendix B. In our regression models that test for a correlation between selfie posting and star rating (described below), we counted photos with a selfie probability of at least 90% as a selfie; those not meeting this threshold were counted as *not* selfies (however, as noted in the web appendix, our results are robust to different cutoffs). Based on this criterion, a total of 1,951 (.23% of) photos in our master dataset were classified as selfies; 1,608 (.57% of) of all reviews in our master dataset included at least one selfie.

Many photos contain faces, but are not selfies (i.e., photos someone else took of the reviewer). Therefore, we generated an additional binary variable to indicate whether a review contains at least one photo of a person, but is not a selfie ( $photo\ of\ person = 1$  or not  $photo\ of\ person = 0$ ), but is not a selfie (we detected individuals using a facial recognition approach, as described in web appendix B). This variable allows us to distinguish food- and location-related photos from photos of people that are not selfies—both important comparison groups for a potential selfie effect. A total of 11,826 reviews contain photos of people that are not selfies (4.18%). We also collected the number of photos per review as an additional control variable.

*Dependent variable.* Our dependent variable was the restaurant star rating on a scale from 1 to 5, observed directly from each review ( $M_{Rating} = 4.09$ ,  $SD = .99$ ).

## Results

We regressed star ratings on the selfie variable. We ran five different models, each featuring different combinations of control variables (table 1). Most importantly, we added both

user and restaurant fixed effects, which likely drive both selfie-taking behavior and restaurant ratings.

The first regression includes only the selfie variable, without controls. It shows a positive significant coefficient estimate of  $\beta_{\text{Brand selfie}} = .55$  ( $p < .001$ , see table 1 M1). However, this estimate is likely inflated, for several reasons. First, there are probably individual differences in selfie-taking propensity, and those differences may be associated with the propensity to give higher star ratings. Indeed, prior research suggests that personality traits of those who take and post selfies may be different from those who do not (Sukhdeep, Maheshwari and Sharma 2018; Sung, Kim and Choi 2018), and it is possible that these personality factors may also be associated with star ratings. Therefore, in M2, we added individual fixed effects (which also capture user demographics, including gender). In this model, the selfie coefficient gets smaller, but remains significant ( $\beta_{\text{Brand selfie}} = .40$ ,  $p < .001$ , see M2).

Second, restaurant quality may be an additional confounder: consumers may be particularly inclined to take selfies at higher quality restaurants, which also tend to get higher ratings. Indeed, when we control for restaurant fixed effects the selfie coefficient gets smaller relative to M1; however, it remains significant ( $\beta_{\text{Brand selfie}} = .29$ ,  $p < .001$ , see M3).

Seasonality may also drive both selfie-taking and ratings, which is why we add time controls (month of the year and year) in M4 ( $\beta_{\text{Brand selfie}} = .19$ ,  $p = .003$ , see M4). The months control for within-year seasonality in the sense that a sunny summer month may trigger greater selfie-taking and liking of the restaurant experience in general. The year controls control for behaviors changing over time because selfie-taking has become more common over time.

In the fifth and final model, we add two additional controls at the level of the restaurant review: the number of photos, and whether the review contains at least one photo with a person

in it, but that is *not* a selfie. Importantly, the brand selfie coefficient remains significant after including these controls: users give higher ratings to a restaurant if they took a selfie in it relative to taking only photos of food or the location ( $\beta_{\text{Brand selfie vs. other}} = .16, p = .005$ ), and also relative to taking photos of people in general ( $\beta_{\text{Brand selfie vs. person}} = .09, p = .033$ ).

Table 1—A positive relationship between selfie-taking and restaurant ratings

DV: Star Rating	M1		M2		M3		M4		M5	
	Coeff.	SE	Coeff.	SE	Coeff.	SE	Coeff.	SE	Coeff.	SE
Brand selfie	.548***	(.025)	.401***	(.024)	.286***	(.043)	.185***	(.039)	.158***	(.037)
Photo of person									.071***	(.013)
Number of photos									.032***	(.002)
Constant	4.087***	(.002)	4.088***	(.002)	4.089***	(.002)	4.119***	(.000)	4.020***	(.004)
Individual fixed effects	included				included				included	
Restaurant fixed effects					included				included	
Time controls									included	
N	283,140		283,140		283,140		149,975		149,958	
R2	.002		.189		.646		.488		.492	
LL	-397,428		-368,148		-250,543		-150,231		-149,669	

Note: Cluster robust standard errors for multi-dimensional fixed effects in parentheses (see Correia, 2017 for estimation approach); \*  $p < .05$ , \*\*  $p < .01$ , \*\*\*  $p < .005$ .

## Discussion

Using user reviews from an online restaurant review platform, study 1 demonstrates that reviewers' posting of a brand selfie is positively correlated with the star rating they give to the restaurant. Consistent with H1—the notion that brand selfie-taking improves selfie-takers' evaluation of the brand—the association persisted after controlling for possible confounders. However, given the correlational nature of this study, we cannot make definitive causal claims. For example, reverse causality could be at play—it could be that having a positive experience at a restaurant causes people to take selfies (and those positive experiences are also captured in the star rating that people subsequently ascribe to the restaurant when reviewing it). Thus, we next turn to randomized experiments to offer more definitive tests of H1.

## STUDIES 2A, 2B AND 2C: CAUSALITY

Studies 2a, 2b and 2c are experiments, allowing for a causal test of H1. Studies 2a and 2c also offer partial tests of H2, testing whether the effect of brand selfie-taking on brand preference is mediated by self-brand connection. Study 2a tests the impact of taking a brand selfie—versus taking no photo whatsoever—on self-brand connection and, in turn, brand preference. Then, studies 2b and 2c test whether it is specifically *brand* selfie-taking, and not simply taking a selfie (without the brand), that shapes self-brand connection, and, in turn, brand preference. Thus, in studies 2b and 2c, all participants are asked to take a selfie; half of them are asked to take a brand selfie. Given that our theory implies that taking a brand selfie without showing it to others or getting feedback from others can increase brand preference, in our experiments, participants do not share their photo with others (e.g., by posting it on social media).

We measure brand preference in different ways. In experiment 2a we measured purchase intention for the focal product. In studies 2b and 2c, after taking a selfie, participants made a choice between the prospect of receiving a product from the target brand, or a more valuable product from a different brand. Thus, studies 2b and 2c studies offer a more conservative test of H1, testing whether brand selfie-taking would lead the consumer to prefer a less-valuable reward from the target brand to a more valuable reward from a brand not included in the selfie.

### Study 2a Method

*Prescreening procedure.* In this and all subsequent online studies (study 2c and studies 3-6), we prescreened participants because we sought to recruit only those who drank soft drinks (as our target brand was a soft drink brand) and who would be willing to, and capable of, using

their webcam during the experiment. In the online recruitment materials, we noted that the survey was only for those who were a) generally interested in soft drinks, and b) willing to use their webcam during the study (we did not mention that we would be asking them to take a selfie, as we worried this would introduce self-selection issues, given that selfie-taking is correlated with certain personality traits; Sukhdeep et al.2018; Sung et al. 2018). Then, at the outset of the experiment—i.e., prior to randomization to condition—we tested the technical requirements: first, we tested whether we were able to access participants’ webcam. Second, we asked participants to indicate whether they were on a desktop computer. Only participants who fulfilled both requirements were directed to the survey. Typically, approximately 80% of prospective participants passed this prescreening procedure and were subsequently randomized to an experimental condition.

Participants ( $N = 409$  Americans from MTurk,  $M_{\text{age}} = 36.72$  years,  $SD = 11.68$ , 49.39% female; incentivized by a small fixed payment) were introduced to the novel soft drink brand “Pivella,” which we made up for the purpose of this study (and studies 3-6). This introduction also included an image of the brand logo, ensuring that all participants were exposed to the brand, as well as a visual of it. Next (randomized between-subjects) half of participants were told that Pivella wants to engage with prospective customers and is therefore asking them to take a selfie with the brand (brand selfie). The survey software then automatically opened participants’ webcam so that they could take the selfie (participants gave consent before the software could access the webcam). The brand logo was overlaid on the photo frame. To increase engagement, participants were told (truthfully; decided by three raters) that the best photo would win a bonus reward; however, participants had the option of skipping the task and proceeding without taking a photo.

*Photo-taking procedure.* Participants randomized to the brand-selfie condition underwent the following photo-taking procedure. These participants saw themselves in the photo frame, and when they were ready, they could take the photo by clicking on a photo-taking button, which was labeled “Take a Selfie with <name of brand>”. After clicking the button, the photo (i.e., still frame) appeared next to the webcam photo frame. If participants clicked on the photo-taking button again, then the old photo was replaced with the new one. Participants could do this as many times as they wished. A “continue” button at the bottom of the screen enabled participants to continue to the next page of the survey when they were ready to do so. The selfie they had taken was displayed on the next page of the survey. As noted, studies 2c-6 use similar photo-taking procedures.

On this next page of the survey, which all participants were exposed to (but which, for participants in the brand selfie condition, displayed the photo they had just taken), we measured our hypothesized mediator using the self-brand connection ( $\alpha = .97$ ) subscale of Thomson, MacInnis, and Park’s brand attachment scale (2005). Specifically, we asked participants to “indicate to what extent the following words describe your feelings toward Rivella: connected, bonded, attached,” with participants rating each adjective on a 7-point scale from “*describes poorly*” to “*describes very well*” ( $\alpha = .98$ ). Next we assessed purchase intent, by presenting participants an image of an online store (see web appendix I) and asked, “If it were offered to you in the online store above, how likely would you be to purchase Pivella here and now?,” on a 7-point scale from “*not at all likely*” to “*very likely*.”

In this and all subsequent online studies (2c-6), we included an attention check at the end of the study in which we assessed whether participants were able to correctly identify what they had been asked to do (i.e., in this study they could choose from options: 1) take a selfie of me

and Pivella; 2) I didn't take a selfie; 3) I don't know). In this and all subsequent studies, the pass rates were high (averaging 92.65% across all studies, and never lower than 78.86% in any given study). And, unless stated otherwise, the pass rates were not significantly different by condition. In this particular study the pass rate was significantly different between conditions (brand selfie = 96.95%, control = 73.11%;  $\chi^2 = 44.541, p < .001$ ). A reason for this difference could be that all participants underwent the prescreening procedure, in which they saw themselves in the webcam screen. We suspect this could have made answering the subsequent attention check question confusing for those in the control group. At any rate, the results are equivalent when we include all participants in the analysis versus remove those who failed. The survey concluded with basic demographic questions and the opportunity to provide feedback.

### Study 2a Results

*Compliance.* Most (85.79%) of participants complied—i.e., took a brand selfie as instructed. In this and all subsequent studies, we used an intent-to-treat approach in our analyses: regardless of compliance, all participants were included in the data analysis.

*Purchase intention.* Participants instructed to take a brand selfie exhibited significantly greater purchase intention relative to those in the control condition ( $M_{\text{Brand selfie}} = 4.15, SD = 1.94; M_{\text{Control}} = 3.54, SD = 1.94; t(407) = -3.18, p = .002, d = -.31$ ), supporting H1.

*Mediation analysis.* A mediation analysis using 10,000 bootstrap samples (Hayes 2017; SPSS Macro PROCESS Model 4) indicated that self-brand connection fully mediated the relationship between brand selfie-taking and purchase intention (indirect effect = .372, BootSE = .122, 95% CI = [.136, .616];  $c' = .238, SE = .151, p = .115$ ; for full mediation table see web appendix G).



## Study 2b Method

Students at a Swiss university ( $N = 100$ ,  $M_{\text{age}} = 24.08$ ,  $SD = 4.57$ , 49% female) came to a behavioral lab on campus to participate in a brief survey for which they would receive a small gift (i.e., a bottle of water)—ostensibly a marketing research survey conducted by Aproz, a medium-priced Swiss water brand. When recruited, participants were asked whether they had their smartphone with them and would be willing to take a selfie during the study; only those who consented came to the lab.

Each participant sat in a separate room and was guided through the experiment by following instructions on a paper questionnaire. A research assistant was also present in the room. First, participants were introduced to Aproz and told that the brand wanted to know more about its potential and future customers, and so was asking participants to either (randomized between-subjects): take a selfie with the brand (brand selfie) or take a selfie of themselves for the brand (selfie). A bottle of Aproz was placed on each participant's desk.

Next, participants took the selfie or brand selfie as instructed, with their own phone. Because participants took the selfie on their phones, and did not share the selfie with us, to help to ensure compliance, all participants were prompted to answer a few questions about their selfie, before concluding with some basic demographic questions (see web appendix C).

Our primary outcome measure was product choice: As a reward for participating, participants chose one of two bottles of still water: a 0.5l bottle of Aproz (the focal brand; Swiss

retail price \$0.65) or a larger, 0.75l bottle from Swiss Alpina (a comparable water brand; Swiss retail price \$0.90)<sup>3</sup>.

### Study 2b Results

*Brand choice.* As predicted, participants instructed to take a brand selfie were significantly more likely to select Aproz relative to those in the selfie condition (percent of brand selfie participants who chose Aproz: 68%; percent of selfie participants who chose Aproz: 48%;  $\chi^2 = 4.11, p = .043$ ).

### Study 2c Method

Participants ( $N = 400$  Americans from Prolific,  $M_{\text{age}} = 31.31$  years,  $SD = 10.57$ , 51% female; incentivized by a small fixed payment) were informed (truthfully) that in addition to the guaranteed payment for participation, they could win a bonus in the form of a voucher for a bottle of a soft drink.

Next, participants saw a description, logo, and image of a bottle of two (real) soft drink brands: “Rivella,” a peach-flavored Swiss soft drink brand, and “San Benedetto,” an Italian soft drink brand that makes a peach-flavored variety. *All* participants were told that Rivella was hosting a brand selfie (vs. selfie) contest; as such, they were asked to either (randomized between-subjects) take a selfie with the brand (brand selfie) or take a selfie of themselves for the

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<sup>3</sup> To verify that the 0.75l Swiss Alpina bottle tends to be preferred to the 0.5l Aproz bottle, in a pretest, we asked a separate sample ( $N = 108$  Americans from MTurk,  $M_{\text{age}} = 35.67$  years,  $SD = 10.56$ , 43% female): “If you would be offered to choose one of the two bottles for free, which bottle would you take?” Most (70% of) pretest participants chose the larger, Swiss Alpina bottle.

brand (selfie). The survey software then automatically opened participants' webcam so that they could take the selfie (participants are asked for consent before the software can access the webcam). In the brand selfie condition, the brand logo was overlaid on the photo frame. In the selfie condition, the same brand logo was shown before the selfie task, but the photo frame did not have the brand logo overlaid. To increase engagement, participants were told (truthfully; decided by three raters) that the best photo would win a bonus reward; however, participants had the option of skipping the task and proceeding without taking a photo. The photo-taking procedure was similar to study 2a; in the selfie condition the photo-taking button was labeled "Take a Selfie."

On this next page of the survey, where the participant's selfie was displayed, we assessed our dependent measure. As in study 2b, participants chose between a smaller drink from the focal brand, and a larger drink from a different brand. Here, participants were asked to choose which reward they would like, should they win the selfie contest: a small, 16.9-ounce bottle of the focal brand Rivella (US retail price \$3.50), or a larger, 50.7-ounce bottle of San Benedetto (US retail price \$14.49)<sup>4</sup>.

Next, we measured our hypothesized mediator using the same self-brand connection ( $\alpha = .97$ ) measure as in study 2a. After assessing participants' task attention, the survey concluded with basic demographic questions and the opportunity to provide feedback.

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<sup>4</sup> To verify that the 50.7-ounce bottle of San Benedetto tends to be preferred to the 16.9-ounce bottle of the focal brand Rivella bottle, in a pretest, we asked a separate sample ( $N = 150$  Americans from MTurk,  $M_{\text{age}} = 35.01$  years,  $SD = 10.11$ , 40% female): "We would like you to indicate which bottle of water you would prefer if you would have to choose to pick one for free." Most (65% of) pretest participants chose the larger, San Benedetto bottle.

## Study 2c Results

*Compliance.* Most (85.75%) participants complied—i.e., took a selfie as instructed—and the compliance rate did not differ by condition (brand selfie = 82.93%, selfie = 88.72%,  $\chi^2 = 2.74$ ,  $p = .098$ ).

*Brand choice.* As predicted, participants instructed to take a brand selfie were significantly more likely to choose Rivella relative to those in the selfie condition (percent of brand selfie participants who chose Rivella: 54%; percent of selfie participants who chose Rivella: 42%;  $\chi^2 = 5.86$ ,  $p = .016$ ).

*Mediation Analysis.* A mediation analysis using 10,000 bootstrap samples (Hayes 2017; SPSS Macro PROCESS Model 4) indicated that self-brand connection fully mediated the relationship between brand selfie-taking and choice (indirect effect = .15, BootSE = .06, 95% CI = [.053, .287];  $c' = 0.35$ , SE = .21,  $p = .088$ ; for full mediation table see web appendix G).

## Discussion

Studies 2a, 2b and 2c provide convergent causal evidence of H1: Relative to those induced to not take a photo at all (study 2a) and to those induced to take a selfie (studies 2b and 2c), participants randomized to take *brand* selfies were more likely to intend to purchase that brand (study 2a) and to choose a reward from the focal brand. The latter even occurred despite the fact that the reward was less-valuable relative to the one offered from a comparable alternative brand (studies 2b and 2c). Studies 2a and 2c go further, providing partial evidence in support of H2: the effect of brand selfie-taking on brand choice was mediated by self-brand connection. Later, in study 4, we measure participants' inferences about their attitudes toward the brand, in addition to self-brand connectedness, allowing for a test of the full serial mediation

model hypothesized in H2. Finally, in study 2a we used an unknown (i.e., fictitious) brand, giving us all the more reason to predict H1 to be supported because self-perceptual processes are particularly likely to emerge in settings in which people do not hold strong attitudes and preferences *a priori* (Chaiken and Baldwin 1981; Fazio et al. 1977). However, in studies 2b and 2c we show that H1 can be supported for known brands as well.

### STUDY 3: EFFECT SPECIFICITY

Studies 2a, 2b and 2c suggest that brand selfie-taking increases brand preference. All participants were introduced to the brand; it was only those instructed to take a *brand* selfie—i.e., to include the brand in their selfie—that exhibited a heightened preference for that brand. However, even though all participants were exposed to the brand during the experiment, it could be argued that those in the brand selfie condition had more exposure to the brand, and thus, that it is exposure to the brand, as opposed to *brand* selfie-taking per se, that heightens brand preference. Therefore, in study 3, we added an additional control condition, in which participants were instructed to simply take a photo of the brand (without the self). Thus, study 3 was a three-condition, between-subjects design in which participants were randomized to either take: a brand selfie, a selfie (without the brand), or a photo of the brand (without the self).

Furthermore, study 3 also provides a partial test of H2, by measuring self-brand connection, this time in two ways—using the same measure as study 2a and 2c, as well as via Escalas’s (1996) self-brand connection scale. We expected these two measures to provide convergent evidence for the role of self-brand connection in the relationship between brand selfies and brand preference.

## Method

Participants ( $N = 370$  Americans from MTurk,  $M_{\text{age}} = 33.81$  years,  $SD = 10.51$ , 53% female; incentivized by a small fixed payment) were introduced to Pivella as in study 2a. Similar to study 2c, *all* participants were told that Pivella wants to engage with prospective customers and is therefore asking them to either (randomized between-subjects) take: a selfie with the brand (brand selfie), a selfie of themselves for the brand (selfie), or a picture of the brand logo without themselves in the photo (brand photo). As in study 2c, the survey software then automatically opened participants' webcam so that they could take the photo. In the brand selfie and brand photo conditions, the brand logo was overlaid on the photo frame.

To increase engagement, participants were told (truthfully; decided by three raters) that the best photo would win a bonus reward; however, participants had the option of skipping the task and proceeding without taking a photo. Participants then proceeded to take the photo (per the photo-taking procedure described in study 2c). The photo-taking button was labeled: "Take a Selfie with Pivella" in the brand selfie condition, "Take a Selfie" in the selfie condition, and "Take a Photo of Pivella" in the brand photo condition. On this next page of the survey, the participant's selfie was displayed, and participants were asked to briefly describe it (by entering a few words into a text box).

Next, we measured self-brand connection in two ways (order of administration was counterbalanced between-subjects). As in study 2a, we administered the self-brand connection subscale of Thomson et al.'s (2005) brand attachment scale ( $\alpha = .97$ ). We also administered Escalas's (1996) self-brand connection scale (we did not administer two items, "I use this brand to communicate who I am to other people," and "I think this brand helps me become the type of

person I want to be,” because we were inquiring about a novel brand, so these items seemed less applicable).

Next, we assessed purchase intention in two ways (again, as with the self-brand connection measures, we expected these two measures to converge on the same result). The first, a weaker indicator of purchase intent, assessed whether participants would be generally inclined to consider purchasing Pivella; participants indicated their degree of agreement with the statement: “I am likely to consider Pivella the next time I think about buying a soft drink,” on a 7-point scale from “*strongly disagree*” to “*strongly agree*.” The second, a stronger indicator of purchase intent, was the same as in study 2a where we presented participants an image of an online store and asked, “If it were offered to you in the online store above, how likely would you be to purchase Pivella here and now?,” on a 7-point scale from “*not at all likely*” to “*very likely*.”

After assessing participants’ task attention, the survey concluded with basic demographic questions and the opportunity to provide feedback.

## Results

*Compliance.* Although the majority (89.73%) of participants complied—i.e., took a photo as instructed—compliance was significantly different by condition (brand selfie = 85.04%, selfie = 89.34%, brand photo-taking = 95.04%,  $\chi^2 = 6.76$ ,  $p = .03$ ). Importantly however, our results are intent-to-treat (i.e., all participants were included in the analysis, regardless of compliance however, results in all studies are comparable when we exclude those who did not comply).

*Purchase intention.* For the stronger purchase intention measure, there were significant differences between conditions ( $F(2, 367) = 4.23$ ,  $p = .015$ ,  $\eta^2 = .023$ ); specifically, participants instructed to take a brand selfie indicated that they would be more likely to purchase Pivella

relative to both the selfie condition ( $M_{\text{Brand selfie}} = 4.44$ ,  $SD = 1.88$ ;  $M_{\text{Selfie}} = 3.74$ ,  $SD = 2.14$ ;  $t(247) = 2.76$ ,  $p = .006$ ,  $d = .35$ ) and the brand photo condition ( $M_{\text{Brand photo}} = 3.90$ ,  $SD = 1.98$ ;  $t(246) = 2.21$ ,  $p = .028$ ,  $d = .28$ ); with purchase intention being equivalent in the latter two conditions ( $t(241) = -.62$ ,  $p = .54$ ,  $d = -.08$ ). For the other measure of purchase intention, results were consistent, though weaker. There were marginally significant differences between conditions ( $F(2, 367) = 2.58$ ,  $p = .077$ ;  $\eta^2 = .014$ ); specifically, participants instructed to take a brand selfie were more likely to indicate that they would consider purchasing Pivella relative to those in the selfie condition ( $M_{\text{Brand selfie}} = 4.67$ ,  $SD = 1.60$ ;  $M_{\text{Selfie}} = 4.16$ ,  $SD = 1.94$ ;  $t(247) = 2.25$ ,  $p = .026$ ,  $d = .28$ ), but not relative to the brand photo condition ( $M_{\text{Brand photo}} = 4.45$ ,  $SD = 1.73$ ;  $t(246) = 1.02$ ,  $p = .311$ ,  $d = .13$ ). Purchase consideration was equivalent in the latter two conditions.

*Mediation analysis.* A mediation analysis using 10,000 bootstrap samples (Hayes 2017; SPSS Macro PROCESS Model 4 with Helmert coding) indicated that self-brand connection fully mediated the relationship between brand selfie-taking and purchase intention (indirect effect, using Thomson et al.'s (2005) measure as mediator = .35,  $SE = .13$ , 95%  $CI = [.096, .622]$ ;  $c' = .27$ ,  $SE = .18$ ,  $p = .14$ ; indirect effect, using the reduced 5-item scale of Escalas's (1996) = .38,  $SE = .15$ , 95%  $CI = [.091, .676]$ ;  $c' = .24$ ,  $SE = .17$ ,  $p = .15$ ). Furthermore, no significant indirect effect between the two control conditions (selfie vs. photo-taking) could be observed (indirect effect, Thomson et al. (2005) mediator = -.10,  $SE = .15$ , 95%  $CI [-.401, .187]$ ; indirect effect, Escalas (1996) mediator = -.07,  $SE = .16$ , 95%  $CI [-.389, .250]$ ; for full mediation table see web appendix G). Significant mediation was also observed when using the weaker measure of purchase interest (see web appendix D).



## Discussion

In sum, study 3 provides additional evidence in support of H1, attesting to the specificity of the effect. Specifically, study 3 documented that it is the taking of a brand selfie, as opposed to merely a selfie (without the brand), or a photo of the brand (without the self) that heightens brand preference. Study 3 also provides convergent partial evidence of H2, demonstrating, via two different measures of self-brand connection, that this construct helps to explain the relationship between brand selfie-taking and brand preference.

## **STUDY 4: PROCESS EVIDENCE VIA SERIAL MEDIATION**

Study 4 was designed to test H2. As in previous studies, participants were instructed to take either a brand selfie or a selfie, and to then report their intention to purchase that brand. Critically however, in addition to assessing self-brand connection as we did in studies 2a, 2c and 3, we also assessed participants' propensity to look to their selfie-taking behavior to make self-inferences. In addition, study 4 was pre-registered (<https://aspredicted.org/blind.php?x=ug88te>).

## Method

Participants ( $N = 308$  US Americans from MTurk,  $M_{age} = 37.85$  years,  $SD = 11.61$ , 50.32% female; incentivized by a small fixed payment) were introduced to Pivella, as in study 2a. Participants were told the brand was conducting marketing research, and thus participants were asked to take either a brand selfie or a selfie (randomized between-subjects). Participants then proceeded to take a selfie, using the same procedure as study 2c.

After taking the selfie, we administered an item designed to capture self-inference: participants indicated their agreement with the statement: “I took this selfie, so I must like Pivella,” on a 7-point scale from “*totally disagree*” to “*totally agree*.” Next, we measured self-brand connection ( $\alpha = .98$ ) and purchase intention using the same measures as in study 2a.

After assessing participants’ task attention, the survey concluded with basic demographic questions and the opportunity to provide feedback. Overall, the attention check pass rate was high (98.38%), but it was significantly different by condition (brand selfie = 100%, selfie = 96.82%;  $\chi^2 = 4.888, p = .027$ ). Fortunately, however, this difference is small in magnitude (less than a 4 percentage point difference in pass rates between conditions), and the results are equivalent when we include all participants in the analysis versus remove those who failed. Below, we report the results including all participants.

## Results

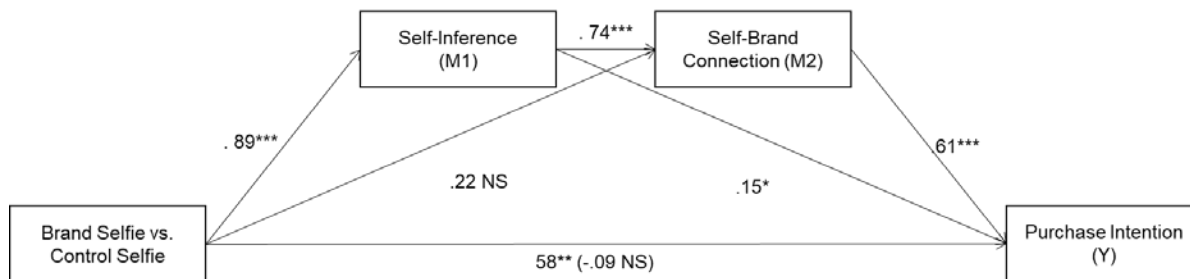
*Compliance.* Most (83.77%) of participants complied—i.e., took a selfie as instructed—and compliance did not differ by condition (brand selfie = 83.44%, selfie = 84.08%;  $\chi^2 = .023, p = .880$ ).

*Purchase intention.* Participants instructed to take a brand selfie exhibited significantly greater purchase intention relative to those in the selfie condition ( $M_{\text{Brand selfie}} = 4.48, SD = 1.86$ ;  $M_{\text{Selfie}} = 3.90, SD = 1.98$ ;  $t(306) = -2.64, p = .009, d = -.45$ ), again, supporting H1.

*Mediation analysis.* A serial mediation analysis using 10,000 bootstrap samples (Hayes 2017; SPSS Macro PROCESS Model 4) indicated that self-inferences and self-brand connection serially mediated the relationship between brand selfie-taking and purchase intention (indirect

effect = .402, BootSE = .111, 95% CI = [.197, .634];  $c' = -.09$ , SE = .16,  $p = .572$ ; figure 3; for full mediation table see web appendix G).

FIGURE 3—SERIAL MEDIATION RESULTS (STUDY 4)



Notes: \*\*\* Significant at 0.1% level; \*\* significant at 1% level, \* significant at 5% level; The effect in parenthesis is the effect that remains after including the mediator variables. The effect of brand selfie-taking was contrasted against the control: taking a selfie without the brand.

## Discussion

In sum, study 4 provides support for our underlying theory of the process by which brand selfie-taking increases purchase interest. Specifically, the results suggest that, even though the instruction to take a brand selfie was externally provided (i.e., by us), participants in this condition nonetheless tended to make self-inferences about their behavior, leading them to a heightened sense of connection to the brand, culminating in heightened purchase interest.

## STUDY 5: PROCESS EVIDENCE VIA MODERATED MEDIATION

Study 5 tests H2 using methods complementary to study 4: Instead of measuring self-inferences as in study 4, in study 5, we sought to manipulate them, by varying participants' facial expressions in their selfies. Specifically, participants were instructed to either have a negative expression on their face (e.g., frown), a positive expression (e.g., smile), or, in a control condition, were given no instruction on how to appear. This manipulation was crossed with our standard manipulation of selfie type (brand selfie vs. selfie); the experiment was therefore a  $3 \times 2$  between-subjects design.

We predicted an interaction such that the facial expression manipulation would affect purchase intention only among those in the brand selfie condition, and not among those assigned to simply take a selfie (without the brand). Specifically, we predicted that in the brand selfie conditions, participants' expressions would affect self-inferences, shaping self-brand connection, and, in turn, affecting purchase intention. As a result, we predicted that the negative expression brand selfie condition would decrease purchase interest, while the positive expression brand selfie condition would increase purchase interest. Furthermore, we measured self-brand connection to test for moderated mediation—i.e., to test whether the interactive effect of selfie type and expression type on purchase intention would be mediated by self-brand connection.

Note that the negative expression condition offers a conservative test of H2 because it may give the selfie-taker mixed signals of his disconnectedness from the brand. Although the negative expression may be interpreted as disconnectedness, as we have shown, selfie-takers tend to view the taking of a photo with the brand as a signal of connectedness to it. By contrast,

from a self-inference perspective, the positive expression condition sends unambiguous messages to the selfie taker of her connectedness to the brand: not only did she take a photo with the brand, but she also looks pleased in that photo, offering another piece of *evidence* of connectedness.

## Method

Participants ( $N = 998$ , international Prolific sample from Europe (74.15%), the United States (23.85%) and other countries (2%),  $M_{\text{age}} = 34.81$ ,  $SD = 11.93$ , 57.11% female; incentivized by a small fixed payment) were introduced to Pivella and, similarly to the previous studies, told participants that the brand was conducting marketing research. Participants were each asked to take either a brand selfie or a selfie (randomized between-subjects). Independently, we also manipulated self-inferences, by giving participants instructions on how to appear in the photo. Specifically, participants were asked to: “take a selfie with Pivella with a sad and angry face expression and body language” (negative expression condition); or to “take a selfie with Pivella with a happy and pleased face expression and body language” (positive expression); or, as in all preceding experiments, given no instruction on how to appear (control condition). To increase engagement, participants were told (truthfully) that one photo (randomly drawn) would win a bonus reward; however, as in previous studies participants had the option of skipping the task and proceeding without taking a photo. Participants then took their photo per the photo-taking procedure described in study 2a.

Next, as a manipulation check, self-inferences were assessed as in study 4. Then, self-brand connection ( $\alpha = .96$ ) followed by purchase intention was measured as in study 2a (however, this time, no photo of the product in the mockup online store was shown).

After assessing participants' task attention, the survey concluded with basic demographic questions and an opportunity to provide feedback. One of the attention check questions, in which we quizzed participants on the expression they were instructed (or not instructed) to exhibit, produced significant differences by conditions: participants in the control condition were less accurate relative to the other conditions, perhaps because they did not receive an instruction to look a certain way in the photo, so this quiz question may have been confusing to them (negative = 81.17; control = 73.98%, positive = 82.89%,  $\chi^2 = 9.46$ ,  $p = .009$ ). However, the results are equivalent when we include all participants in the analysis versus remove those who failed. Below, we report the results including all participants.

## Results

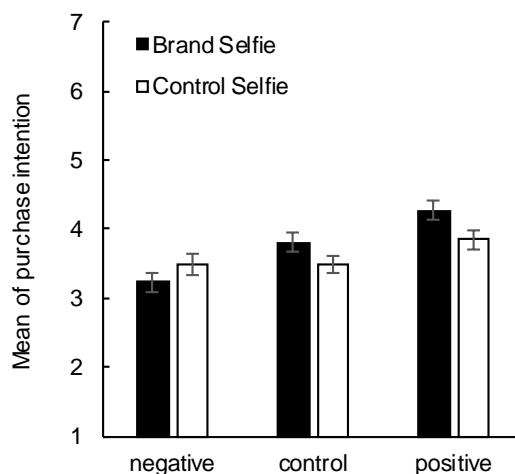
*Compliance.* Most (92.79%) of participants complied—i.e., took a selfie as instructed—and compliance did not differ by condition (brand selfie = 92.91%, selfie = 92.66%;  $\chi^2 = .025$ ,  $p = .876$ ).

*Manipulation Check.* A  $2 \times 3$  ANOVA revealed a main effect of the expression instruction ( $F(2, 992) = 26.66$ ,  $p < .001$ ,  $\eta^2 = .05$ ), a main effect of brand selfie-taking ( $F(1, 992) = 38.38$ ,  $p < .001$ ,  $\eta^2 = .04$ ), and an interaction ( $F(2, 992) = 22.94$ ,  $p < .001$ ,  $\eta^2 = .01$ ). First, the main effect of the expression instruction indicated that, as predicted, participants were most likely to agree with the statement “I took this selfie, so I must like Pivella” in the positive expression condition ( $M = 3.18$ ,  $SD = 2.08$ ), followed by the control condition ( $M = 2.69$ ,  $SD = 1.84$ ), and lowest in the negative expression condition ( $M = 2.12$ ,  $SD = 1.49$ ). Secondly, the tendency to make these self-inferences was significantly greater in the brand selfie condition ( $M = 3.03$ ,  $SD = 2.00$ ) relative to the selfie condition ( $M = 2.30$ ,  $SD = 1.64$ ). Importantly however,

this effect was qualified by a significant interaction, which indicated, as expected, that the expression manipulation had a bigger effect on brand selfie-takers relative to selfie-takers. Specifically, among those in the positive expression condition, brand selfie-takers were more likely to agree with the self-inference item than mere selfie takers ( $M_{\text{Brand selfie, positive}} = 3.74$ ,  $SD = 1.46$ ,  $M_{\text{Selfie, positive}} = 2.61$ ,  $SD = 1.78$ ,  $t(296) = -4.83$ ,  $p < .001$ ,  $d = -.56$ ). This pattern also emerged in the control condition ( $M_{\text{Brand selfie, control}} = 3.14$ ,  $SD = 1.96$ ,  $M_{\text{Selfie, control}} = 2.24$ ,  $SD = 1.60$ ,  $t(390) = -4.93$ ,  $p < .001$ ,  $d = -.50$ ). It did not emerge in the negative expression condition ( $M_{\text{Brand selfie, negative}} = 2.17$ ,  $SD = 1.46$ ,  $M_{\text{Selfie, negative}} = 2.08$ ,  $SD = 1.52$ ,  $t(306) = -.51$ ,  $p = .607$ ,  $d = -.06$ ), perhaps because of ambiguous self-perceptual signals, as noted earlier.

*Purchase intention.* A 2 x 3 ANOVA revealed a main effect of the expression instruction ( $F(2, 992) = 11.86$ ,  $p < .001$ ,  $\eta^2 = .02$ ) and an interaction ( $F(2, 992) = 3.37$ ,  $p = .035$ ,  $\eta^2 = .01$ , see figure 4). Follow-up tests revealed that, as predicted, the expression instruction only affected the purchase intention of those randomized to take a brand selfie ( $F(2, 491) = 13.00$ ,  $p < .001$ ,  $\eta^2 = .05$ ), and not those randomized to take a selfie without the brand ( $F(2, 501) = 2.11$ ,  $p = .123$ ,  $\eta^2 = .01$ ). Specifically, and as shown in figure 4, looking within the brand selfie conditions, purchase intention was significantly higher in the positive expression condition relative to the control condition ( $t(344) = 2.37$ ,  $p = .018$ ,  $d = -.26$ ), and significantly lower in the negative expression condition relative to the control condition ( $t(342) = -3.03$ ,  $p = .002$ ,  $d = -.33$ ).

FIGURE 4—THE EFFECT OF BRAND SELFIE-TAKING ON PURCHASE INTENTION IS MODERATED BY EXPRESSION POSITIVITY



Note: error bars represent standard errors.

*Moderated Mediation Analysis.* A moderated mediation analysis using 10,000 bootstrap samples was conducted to test the conditional indirect effect (Hayes 2017; SPSS Macro PROCESS Model 7). Results indicate that self-brand connection mediates the effect of brand selfies on purchase intention for those in the positive expression condition (conditioned indirect effect = .550, BootSE = .131, 95% CI = [.296, .801]) and for those in the control condition (conditioned indirect effect = .191, BootSE = .075, 95% CI = [.045, .336]) but not for those in the negative expression condition (conditioned indirect effect = -.168, BootSE = .111, 95% CI = [-.385, .053]; index of moderated mediation = .359 BootSE = .096, 95% CI = [.170, .549]).

## Discussion

Taken together, studies 4 and 5 provide convergent evidence of H2 (and H1), study 4 via serial mediation, and study 5 via moderated mediation. Moreover, these results are not limited to



a specific type of facial expression; effects are comparable with alternative positive or negative expressions (e.g., smiling vs. sticking tongue-out, see web appendix H).

### **STUDY 6: MODERATION BY SELFIE SATISFACTION**

Studies 1-5 suggest that brand selfie-taking increases participants' brand preferences by increasing self-brand connection. In study 6, we test a moderator of the effect (H3): selfie satisfaction. Specifically, we posit that when a selfie-taker is dissatisfied with her selfie, she will engage in defensive processing: instead of responding to this unwelcome information by adjusting her impression of her own attractiveness (downward), she will instead respond in a way that leaves her self-impression intact, by "blaming" the brand. In other words, we predict that the positive effect of brand selfie-taking on brand preference will be attenuated by dissatisfaction with one's selfie.

#### **Method**

As in study 4, participants ( $N = 400$ , Americans from MTurk,  $M_{\text{age}} = 34.74$  years,  $SD = 10.53$ , 60.25% female; incentivized by a small fixed payment) were introduced to Pivella, and told that the brand was conducting marketing research, as in studies 3 and 4. Participants were then asked to either (randomized between-subjects) take a brand selfie or a selfie. Participants then proceeded to take the selfie using the same procedure as in study 2c.

After taking the selfie, we asked participants to "indicate how satisfied you are with your selfie" on a 7-point scale from "not at all" to "very much." Next, we measured self-brand connection ( $\alpha = .97$ ) followed by purchase intention as in study 2a. After assessing participants'

task attention, the survey concluded with basic demographic questions and the opportunity to provide feedback.

## Results

*Compliance.* Most (87%) of participants complied—i.e., took a selfie as instructed—and compliance did not differ by condition (brand selfie = 88.14%, selfie = 85.92%,  $\chi^2 = .44$ ,  $p = .509$ ).

*Purchase intention.* Regressing type of selfie (manipulated) and selfie satisfaction (measured) on purchase intention revealed a main effect of brand selfie-taking ( $\beta_{\text{Brand selfie}} = .655$ ,  $p < .001$ ), selfie satisfaction ( $\beta_{\text{Satisfaction}} = .221$ ,  $p < .001$ , mean-centered) and an interaction ( $\beta_{\text{Brand selfie} \times \text{satisfaction}} = .22$ ,  $p = .035$ ;  $F(3, 396) = 19.59$ ,  $R^2 = .13$ ; see web appendix E for details on the different models).

*Moderated Mediation Analysis.* A moderated mediation analysis using 10,000 bootstrap samples was conducted to test the conditional indirect effect (Hayes 2017; SPSS Macro PROCESS Model 7). Results indicate that the effect of brand selfies on self-brand connection is moderated by the level of selfie satisfaction (index of moderated mediation = .16, BootSE = .075, 95% CI = [.011, .305]).

## Discussion

Study 6 replicates previous findings and provides evidence of H3: dissatisfaction with one's selfie attenuated the positive effect of brand selfie-taking.

## GENERAL DISCUSSION

Increasingly, consumers are taking self-photos and marketers, eager to capitalize on this trend, have started asking consumers to take self-photos with brands (i.e., brand selfies). Yet despite the pervasiveness of selfie-taking, the potential marketing implications of this behavior are not yet well understood. Therefore, in eight studies, we assessed how brand selfie-taking shapes the consumer's sense of connection to the brand, and, in turn, her preference for that brand. First, in a dataset of 283,140 user reviews from Yelp, study 1 documented a positive association between a reviewer's propensity to take a brand selfie and the star rating he gives to that restaurant. Next, seven experiments pointed to causality: participants randomized to take brand selfies felt more connected to the brand, and exhibited heightened purchase interest, relative to those randomized to not take a photo at all (study 2a), take a selfie (without the brand; studies 2b-6), or to take a photo of the brand (without the self; study 3). Moreover, two studies pointed to process in convergent ways, via serial mediation (study 4) and moderated mediation (study 5). A final study documented a crucial moderator: dissatisfaction with one's appearance in the selfie triggers defensive processing, reducing self-inference and thereby, the capacity for brand selfie-taking to increase brand preference.

### Contribution

We contribute to both the science and practice of marketing. With respect to scholarship, we contribute to several distinct yet related literatures in consumer behavior. Specifically, we contribute to the literature on brand relationships by documenting a novel process by which self-brand connections can be constructed: self-inferences generated by the taking of a selfie with the

brand. Moreover, in focusing on how such self-inferential processes are triggered by the increasingly common activity of brand selfie-taking, we also contribute to the literatures on user-generated content, and consumer photo-taking. Specifically, we contribute to the literature on user-generated content by exploring how a novel form of user-generated content—brand selfie-taking—affects consumers’ behaviors toward the brand. And, we contribute to the literature on consumer photo-taking—*not* by exploring how photo-taking affects the photo-taker’s enjoyment of the experience (this has already been studied), but rather by exploring the relational consequences of this activity—i.e., documenting how a particular type of photo-taking—brand selfie-taking—shapes consumer’s sense of connection toward a brand.

Moreover, by investigating photo-taking in a branding context, our research integrates the photo-taking literature with work on user-generated content and word-of-mouth marketing, expanding our understanding of digital branding. Previous research in this domain highlights how consumers’ engagement in content-creation (e.g., writing reviews, sharing branded content) may affect brand outcomes. Here, we look at the effects on the content-creator himself—a topic that has been understudied in the user-generated content and word-of-mouth marketing literatures.

With respect to practice, our investigation offers guidance to marketers on when and why encouraging consumers to take brand selfies may augment or detract from attempts to foster a consumer-brand connection. This is particularly relevant given that increasingly, marketers have been encouraging consumers to take brand selfies, for example, by creating displays that are “Instagrammable”—i.e., designed for the express purpose of inducing consumers to photograph themselves with the brand, and to share those photographs on social media. Interestingly, our findings imply that marketers may be over-concerned with the appearance of the brand in the

photo, and under-concerned with helping the consumer to feel satisfied with her own appearance. Indeed, study 6 suggested that the capacity for brand selfie-taking to induce feelings of connection was disrupted when the consumer was dissatisfied with her photo.

### Directions for Future Research

Given that only a small proportion of such photos are, in fact, shared, here, we focused on the effect that such photo-taking has on the photo-taker himself, absent the intention to share. This leaves several opportunities for future research. First, future work could explore the effects of brand selfie-taking on photo-takers who intend to share the selfie. Previous research has shown that the intention to share can affect content creation by increasing self-presentational concerns (Barasch et al. 2018). It is therefore possible that when consumers take brand selfies with the intention to share, they may be particularly concerned with looking good in those photos, potentially heightening the moderating role of selfie satisfaction. On the one hand, such self-presentational concerns could make consumers hyper self-critical, reducing selfie satisfaction (and thereby attenuating the positive effect of brand selfie-taking on brand preference). Or, on the other hand, self-presentational concerns could prompt consumers to take photos in which they do look more attractive, increasing selfie satisfaction. Another possibility is that self-presentational concerns may distract the selfie-taker from noticing the brand, blocking the self-inferential process we document here. Future research is needed to test such possibilities.

Second, future work could explore the effect of brand selfie-taking on others; for example, on the people with whom the selfie-taker shared the photo. If you encounter a brand selfie on Instagram, how would that shape your preference for that brand? Would the effects be different from the social endorsement effects already identified in the marketing literature (e.g.,

Kahle and Homer 1985; McCracken 1989; Miller and Allen 2012)? If so, how and why might they be different? Intrigued by these questions, we conducted an additional study in which we showed participants a selfie of someone else, which either included the brand (i.e., brand selfie) or did not include the brand (i.e., selfie), and assessed purchase intention. We found an interaction ( $\beta_{\text{Attractiveness} \times \text{brand selfie}} = .38, p = .013, F(3, 197) = 22.35, R^2 = .25$ ): the effect of viewing a brand selfie on purchase interest depended on the attractiveness of the selfie-taker. That is, when the selfie-taker was attractive, viewing a brand selfie seemed to augment purchase interest relative to viewing a selfie of the same person (marginally;  $\beta = .64, p = .083$ ). However, when the selfie-taker was less attractive, viewing a brand selfie *decreased* purchase interest relative to viewing a selfie of the same person ( $\beta = -.77, p = .045$ ).

Future work could also explore how the nature of the brand may moderate effects of brand selfie-taking. Here, we tended to focus on brands that are likely to resonate with participants—in almost all of our studies, and following purchase intention studies (e.g., Ding 2007), we prescreened participants based on their interest in the given product category. However, it is possible that when the consumer feels the brand is completely identity irrelevant, the positive effect of brand selfie-taking on self-brand connection may be dampened; indeed, there is preliminary evidence to suggest this may be the case (Bharti and Ng, 2019). Relatedly, whether a brand plays to the aspirational self or the actual self may be another important moderator. Presenting a brand in an overly idealized manner could also be a moderator trigger defensive processing, in which case, brand selfie-taking would not be helpful for augmenting consumers' brand preferences. On the other hand, such brands could be motivational, resulting in positive effects. Moreover, although, across studies, we documented our effects in both known as well as unknown brands, future work could manipulate brand novelty; given that people are

particularly likely to engage in self-inferential processes when they do not have strong attitudes and preferences to begin with, one might expect the effect of brand selfie-taking on brand preference to be pronounced for novel brands, or brands that consumers are not very familiar with. Future research should explore such possibilities.

Another potentially fruitful direction for future research is to investigate how individual and cultural differences may moderate the influence of brand selfie-taking. Underlying our research is the assumption that consumers generally hold positive self-views and perceive an unsatisfying selfie as a threat to their self-view. However, for consumers who have negative self-regard, an unsatisfying selfie could be perceived as a confirmation of their self-view. When such consumers perceive their selfie to be unattractive, such perceptions would confirm their self-view, potentially leaving the self-brand connection formation intact. Different cultural backgrounds may also lead to varying self-inferences from brand selfies. Individualist western culture—the dominant cultural orientation of our participants—emphasizes personal achievement and promote self-esteem. Thus, in such cultures, protecting the self from feelings of failure is more critical, meaning that here, brands may be particularly susceptible to being used as scapegoats when the selfie-taker is dissatisfied with her appearance in the photo.

Last, but not least, future research should also explore how long the effects of brand selfie-taking on brand preference last. Here, we offer an “existence proof” that brand selfie-taking can foster feelings of connections to the brand, affecting immediate consequential choices. We welcome additional research on the boundaries of the effects, including their longevity.

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