



Objectification and Reactions toward Public Female Toplessness in the United States: Looking Beyond Legal Approval

Colin R. Harbke¹ · Dana F. Lindemann¹

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Abstract

Multiple United States federal courts have recently drawn inferences regarding community sentiment as it pertains to public female toplessness. Despite citing common social factors in their rulings, the courts have rendered conflicting decisions to uphold (Ocean City, MD) or to overturn (Fort Collins, CO) female-specific bans. Regional differences in attitudes toward toplessness may in part explain these discrepant legal outcomes. Participants ($n = 326$) were asked to rate their general impressions of photos depicting topless women in three different public settings. Geographic region was unrelated to reactions toward toplessness, however, participants from states with prohibitive or ambiguous statutes rated the photos differently. Consistent with a body of theoretical and empirical work on cultural objectification of women, female participants, on average, were more critical of the photos of other topless women. Other demographic and attitudinal predictors showed a pattern that suggests moral objections as a likely source of unfavorable reactions. Ascribing morality with the practice of toplessness echoed some of the commentary that surrounded the above legal cases and further substantiates prior objectification research (i.e., Madonna-whore dichotomy). Overall, attitudes toward public female toplessness appear to be driven more by individual opinions than by context (e.g., beach, park) or structural factors (e.g., region or state-legality).

Keywords Public female toplessness · Partial nudity · Bare breast · Objectification · Madonna-whore dichotomy · Equal rights · Sexism

✉ Colin R. Harbke
CR-Harbke@wiu.edu

¹ Western Illinois University - Quad Cities, Moline, IL, USA

Introduction

In many Western cultures men and women face different social and legal ramifications for appearing topless in public, and this discrepancy is an important issue for equal rights efforts. Advocacy groups such as the Top Freedom Equal Rights Association (2015) have endeavored for equal rights to go topless since 1997. This social issue gained widespread attention in contemporary culture with the 2014 film *Free the Nipple* (Esco, 2014), which spurred the advocacy group by the same name (Free the Nipple, n.d.), and the movement has continued to garner global social and political attention ever since. Some of the more recent developments have been on the legal front.

A recent District Court ruling upheld a 2017 Maryland (U.S.) city ordinance that outlawed women (but not men) from going topless on city beaches (Chelsea Eline et al. v. Town of Ocean City, MD, 2020). The explanation for the female-specific ban was that secondary sexual functions of the female breast are incompatible with the family-friendly social setting Ocean City intended for its beaches. The ruling reinforced the defendant's rationale such that "protecting the public sensibilities from the public display of areas of the body traditionally viewed as erogenous zones—including female, but not male, breasts—is an important government objective" (p. 16). The Court also cited prior rulings by the 7th (Tagami v. City of Chicago, 2017) and 8th Circuit Courts of Appeals (Free the Nipple – Springfield Residents Promoting Equal v. City of Springfield, 2019) that had previously upheld similar bans. The notion that the public should be sheltered from female breasts is predicted by objectification theory (Fredrickson & Roberts, 1997) and related work (e.g., Bareket et al., 2018).

Objectification Theory and Attitudes toward Public Female Toplessness

Fredrickson and Roberts (1997) and Szymanski et al. (2011) posit that in some cultures women's worth is predominantly, or at least initially, inferred from her physical appearance. Objectification theory further postulates that this appearance-based inference of females' worth is through the perceptive lens of heterosexual men. Thus, the legal argument that only the female breast is stereotypically viewed as inherently sexual is well-explained by objectification theory. As opposed to enculturating the female breast as a source of women's own pleasure, for child rearing, or for no specific purpose, within the context of objectification theory the female breast is culturally highlighted for men's pleasure (i.e., inherently sexual). Objectification theory also asserts that women from these cultures internalize and adopt the objectifying perspective as their own standards for beauty and body surveillance. Additional research explains that – despite that the vantage of heterosexual men is culturally emphasized – both men and women routinely objectify women (e.g., Riley et al., 2016). Specifically, the dominant theme that emerged from Riley et al.'s interviews with 44 women was that "such looking [by other women] was almost inescapable" (p. 101). Paradoxically then, women's own role in this way is potentially even more consequential, in that they contribute to their own gender's objectification by

policing other women's behaviors (see also Daniels & Zurbriggen, 2016), as well as by their own self-objectification (Moradi & Huang, 2008; Szymanski et al., 2011). A related manifestation of this objectification is the Madonna-whore dichotomy.

The Madonna-whore dichotomy has a rich history in psychology (see Hartmann, 2009) and describes a polarized conception of women where their dual roles within the family system (i.e., being both nurturing and sexual) are incompatible. Tacit associations of "goodness" with chastity and "badness" with promiscuity have been documented in Western cultures since Hellenistic Greece and appear in multiple forms of media in contemporary culture (Kahalon et al., 2019). Bareket, Kahalon, and colleagues (2018) contend and provide evidence that the Madonna-whore dichotomy serves to justify both women's objectification and the sexual double standard (i.e., societal endorsement of males' sexual activity, but not females'), which ultimately reinforces patriarchal systems. Together the Madonna-whore dichotomy and sexual double standard serve to justify the practice of ascribing personality and morality traits to women based on perceptions of their sexuality (e.g., temptress) or chastity (e.g., purity). Because the extent to which the objectification and policing of women's behavior may differ between communities, attitudes toward female public toplessness may also differ regionally; this possibility is further supported by the complex legal landscape across the United States.

Legality of Public Female Toplessness Across the United States and Canada

A challenge to a 2015 amendment that barred women and girls over the age of 10 in Fort Collins, Colorado from exposing their breasts in public (Fort Collins City Council, 2015) led to a District Court decision that such a ban was unconstitutional, specifically because it applied only to female persons (i.e., Equal Protection Clause of the 14th Amendment; *Free the Nipple, Hoagland, & Six v. City of Fort Collins*, 2017, 2019). In appeal the U.S. 10th Circuit Court affirmed the lower court's decision and, interestingly, expressed a nearly opposite sentiment to that from the previously reviewed Ocean City, MD case in that "... the City's [of Fort Collins] professed interest in protecting children derives not from any morphological differences between men's and women's breasts but from negative stereotypes depicting women's breasts, but not men's breasts, as sex objects" (p. 18). Discrepant legal rulings at such high levels of the judicial system is puzzling; even more perplexing is that two courts rendered their opposing decisions in the exact same year: 2019. Moreover, the rationales behind each decision drew inferences regarding community (or regional) sentiment about the sexuality of the female (but not male) breast.

Conflicting rulings for similar cases in the same year resulted in confusion for the public. After the Fort Collins ban was overturned (*Free the Nipple, Hoagland, & Six v. City of Fort Collins*, 2017, 2019) multiple local (e.g., Forgie, 2019; KAKE News, 2019) and national media outlets (e.g., Shah, 2020; Vogt, 2019) reported that public female toplessness was legal throughout the six states within the 10th Circuit Court's Jurisdiction. The 2-to-1 ruling, however, did not include a full adjudication, which was interpreted by some officials to indicate that they shall enforce their bans (e.g., Forman, 2019; Hughey, 2019). Notably, the Fort Collins City Council

(2019) subsequently amended their public nudity code to remove the prohibitive language. Such a confusing legal landscape is commonplace throughout most Western cultures.

In the United States, 34 states permit public female toplessness (e.g., have no expressed prohibitions), 13 states have ambiguous laws, and 3 states have statutes that specifically prohibit female toplessness (GoTopless.org, n.d.). Even though toplessness may be legal in a particular state, many local government or public policies expressly prohibit it (e.g., park or beach use policies; Cusack, 2012; Helppie-Schmieder, 2015), as the cases above illustrate. Legality of female toplessness is similarly opaque in Canada, where despite various local laws and codes that prohibit female public toplessness, multiple province-level rulings have overturned such restrictions (*Maple Ridge v. Linda Meyer*, 2000; *Regina v. Jacob*, 1996). Despite potential clarity that higher courts could provide, at present, neither Supreme Courts of the United States nor Canada have heard cases regarding the constitutionality of disparate legal treatment of public toplessness for males and females.

Laws and Behavior Change: The Role of Perceived Social Norms and Personal Attitudes

Multiple layers of conflicting laws and rulings regarding public female toplessness across the United States and Canada may be surprising. What is unsurprising, however, is the reliance on community sentiment and moral standards as a backdrop for legal regulation. Laws can serve to change people's behavior through multiple different paths. The most direct route for changing behavior is through regulation that is accompanied with enforcement via sanctions or rewards (Bilz & Nadler, 2014). Laws also operate indirectly to affect behavior by changing attitudes, and this indirect route can be particularly advantageous for the state as it has the potential to simultaneously reduce – or even eliminate – the need for governmental oversight (Bilz & Nadler, 2014). Evidence from randomized experimental designs show that the simple act of reading a mock news article that conveys a future legal action is likely (or unlikely) can shift personal attitudes in the intended direction (Tankard & Paluck, 2017), and there is considerable evidence that, as long as people view a legal system and its agents as legitimate, people will defer to the law as a source for moral guidance (Tyler, 2006). Laws provide citizens with normative values for what is considered to be “good.” Legal efforts to regulate smoking in the United States began in 1964, for example, but it was not until the 1986 medical finding of deleterious health effects of secondhand smoke that widespread adoption of unfavorable attitudes toward smoking occurred (Bilz & Nadler, 2014). The notion that someone could have harmful health consequences imposed upon them from others' actions transformed smoking into a moral issue and both public outcry and prohibitive regulation intensified. In this way, legal regulation may also have a reciprocal impact on attitudes in that violating the law, be it newly created or previously established, provides a basis for shame (Kotsadam & Jakobsson, 2011). The moderating role that morality played in how smoking regulation impacted personal attitudes is largely

intuitive; however, the relationship between legislation and attitudes is not always this clearcut.

Norway's 2019 criminalization of prostitution brought negligible change in attitudes toward prostitution after the law was enacted and also relative to the Swedish population, which did not enact similar prohibitions (Kotsadam & Jakobsson, 2011). When data were restricted to the subsample of respondents from the Norwegian capital city Oslo, where prostitution was more widespread, however, this subsample developed more unfavorable attitudes that coincided with the prohibition. This pattern was in accord with prior theoretical work (e.g., Soss & Schram, 2007) in which it was hypothesized that the visibility of legal changes (e.g., media attention) and proximity to the change (i.e., the extent to which people are personally affected by or will be affected by new laws) are important predictive factors in how laws impact personal attitudes. While these two factors are important for changing personal attitudes directly, an alternative route through which legislation can impact attitudes extends through perceptions of social norms (i.e., perceived community sentiment).

In 2015, the United States Supreme Court (*Obergefell v. Hodges*) decided that all individuals, irrespective of the couple's sexes, have the same legal right to marry. Longitudinal data showed that the most notable change that coincided with the landmark decision was perceived social norms regarding acceptance of same-sex marriage by others (Tankard & Paluck, 2017). This shift in perceived norms was accompanied with a parallel shift in perceptions of the extent to which social norms regarding the issue were changing, yet neither of these impacts on social norms immediately extended into personal attitudes toward same-sex marriage or feelings toward gay people. It is worth noting that prior to the 2015 ruling 35 U.S. states had already passed legislation that served to legalize same-sex marriage and there was a prevailing trend toward more favorable attitudes (i.e., diminishing anti-gay biases) that steepened after the ruling. A somewhat paradoxical pattern was observed in another study when anti-gay biases were compared at the state-level (Ofosu et al., 2019). Among residents of the 15 states where same-sex marriage had not yet been legalized, attitudes became increasingly less favorable once the ruling was released, even though these same states were part of the prevailing supportive trend prior to the ruling. Ofosu et al. (2019) suggested that local sentiment in these 15 states had not yet reached a critical tipping point when the decision was made public, and a reactive "backlash effect" was observed in response to the federal ruling. This pattern is also consistent with boomerang effects, a well-known phenomenon in attitude change research (see Byrne & Hart, 2009) where people adopt a strong counter-reaction in response to actions they perceive as deliberate attempts to influence their opinions. As legal action can serve to impact attitudes in both intended and unintended directions, it is important to also understand the current state of attitudes toward toplessness in the first place.

Empirical Research Regarding Attitudes toward Toplessness

In the earliest published examination of attitudes toward public female toplessness, Herold and colleagues (1994) assessed women's perceptions of legality and their

own toplessness behaviors at public beaches. Although the vast majority of their Australian college student sample (92%) agreed that women have the legal right to go topless at beaches, only one-half of their participants (53%) reported having gone topless themselves in this context. The proportion of respondents who reported having gone topless reduced dramatically for activities other than sunbathing (i.e., 37% reported having gone swimming topless, 24% reported walking along the water topless, and less than 1% reported being topless in the parking lot or beach shops). Relative to those who had not previously gone topless, women who reported having been topless at a public beach regarded their toplessness as more natural, tended to hold more permissive attitudes toward sexuality, and reported less frequent religious attendance. Consistent with objectification theory and the extension that women police others' behavior (Daniels & Zurbriggen, 2016; Riley et al., 2016), women who reported having never gone topless themselves attributed the practice to flaunting one's sexuality and indicative of seeking of sexual attention from men. In a follow-up study with college-aged men, Herold et al. (1995) found that men generally agreed that women have the legal right to go topless on beaches (89%) and held favorable attitudes toward their partner or wife going topless at public beaches (80%). Herold et al. did not explicitly interpret the differences they noted between the samples of women (1994) and men (1995). Even so, the pattern that emerged is also consistent with the Madonna-whore dichotomy such that a greater proportion of women (relative to men) associated some degree of amorality to the practice of public female toplessness. Even though women, in general, were more likely to report these sort of attributions, one-fifth of the men Herold et al. (1995) sampled also viewed public toplessness as a moral issue and disapproved.

The moral "rightness" of public toplessness is a recurrent theme for the two subsequent surveys on the topic that also expanded beyond the beach context (i.e., Fischtein et al., 2005; Harbke & Lindemann, 2018). Similar to Herold et al.'s (1994) examination of various beach-going activities (e.g., sunbathing, walking along the water, shopping), Fischtein et al. compared attitudes toward female toplessness across three different public contexts: at beaches, parks, and on city streets. Approval in their Canadian sample was considerably lower than the previous Australian samples, and a hierarchy of approval emerged based on the context in which the toplessness occurred. Roughly one-half of respondents approved of toplessness on public beaches (52%), but smaller proportions approved of it in public parks (38%) or on city streets (28%). Men and those from British Columbia or Ontario were more likely to hold favorable attitudes toward female toplessness. In contrast, those who attended religious services more frequently tended to report less favorable attitudes toward toplessness, reinforcing Herold et al.'s (1994, 1995) conclusion that public toplessness may reflect a moral issue for some people. These findings have been replicated with an international sample by Harbke and Lindemann (2018) who also found that child protectiveness beliefs and disgust sensitivity were further linked with disagreement that female toplessness should be legal in public, which reinforces some of the morality-based opinions and commentary that surrounded the U.S. legal prohibitions described previously (Chelsea Eline et al. v. Town of Ocean City, MD, 2020; e.g., Williams, 2019). Ascribing amorality to others' behaviors is known to engage a variety of powerful social processes that collectively serve

to correct perceived transgressions (i.e., shame, social censure, overt punishment) and to maintain cooperation (Boyd et al., 2003), even by those who are otherwise uninvolved in the offending interaction (Buckholtz & Marois, 2012). Thus, attributing amorality to topless women (e.g., Madonna-whore dichotomy) may be a means through which the behavior is policed by bystanders, and women (relative to men) are more likely to engage in moral policing in this way.

The Current Study

Prior research regarding attitudes towards toplessness has operationalized attitudes as self-reporting having gone topless oneself (Herold et al., 1994), being supportive of one's partner or wife being topless in public (Herold et al., 1995), or, most often, personal approval of the legality of toplessness (Fischtein et al., 2005; Harbke & Lindemann, 2018; Herold et al., 1994, 1995). Such research has identified multiple situational (e.g., activity or context), demographic (e.g., participant sex, religiosity, region of Canada), and attitudinal factors related to support (e.g., sexual permissiveness). Because prior research has centered around perceived legal approval or practice of female public toplessness, however, these past findings are heavily weighted toward legality. Moreover, reliance on self-reported approval or personal practice is confounded by the legality of toplessness in the participant's locale. To date, regional differences in support have only been explored in Canada (Fischtein et al., 2005); no research has studied regional differences in support across the United States or other countries.

The current study utilized a novel operational definition that was not tied to legality. Ecological validity was improved by measuring personal reactions toward photographs of women who were topless in public settings; participants shared their general impressions of each photo using a closed-ended rating scale. The photos were intentionally selected to depict the same three contexts that have been examined in prior legality-based research (i.e., public beaches or pools, parks, & city streets). Consistent with past research, the strongest overall predictor of reactions was expected to be the context in which the toplessness occurs (Hypothesis 1). Given prior evidence for regional differences in Canada (i.e., Fischtein et al., 2005), it stands to reason that reactions would also differ across regions in the United States (Hypothesis 2). Given variability in legality across the United States (e.g., Helppie-Schmieder, 2015), it was further hypothesized that reactions would be more favorable among those from states where female public toplessness is not prohibited by state statutes (Hypothesis 3). Hypotheses 4 and 5 shifted attentions from contextual and structural factors to demographic and individual differences variables as potential predictors. Based on objectification theory and the previously described policing expectation, it was hypothesized that women would view images of topless women more critically than men (Hypothesis 4) and, as a replication of prior legality-based studies, that morally suggestive demographic and attitudinal variables would show links with reactions via a photo rating task (Hypothesis 5). Lastly, it was expected that individual differences in regional, state-legality, demographic, and attitudinal predictors of support would remain significant after accounting for context.

Method

Participants

The majority of participants (80%) were recruited via discussion spaces on parenting websites (e.g., [mothering.com](https://www.mothering.com), [justmommies.com](https://www.justmommies.com), [dadzclub.com](https://www.dadzclub.com), [dadlabs.com](https://www.dadlabs.com)), Facebook pages (e.g., [parenting.com](https://www.parenting.com)), and online forums (e.g., Reddit) as part of a larger study on parenting and breastfeeding. The remaining 20% of participants were recruited via posts made on the research team's social media profiles. Seventy percent of those who consented to participate subsequently supplied usable demographic information near the end of the survey. The sample was reduced to those who reported living in the United States and being aged 18 years of age or older, usable $n = 326$. Most participants reported being female ($n = 253$; 78%), with an additional 70 reporting being male (22%), and 3 individuals (1%) who did not report.¹ Table 1 displays the demographic composition of the sample. Of the overall sample, 311 (95%) provided valid U.S. zip codes representing 42 different states and the District of Columbia (see Fig. 1). State of residence was further coded as being one in which public female toplessness was legal ($n = 210$; 68%), had ambiguous legal status ($n = 88$; 28%), or was expressly prohibited ($n = 13$; 4%) based on information compiled by [GoTopless.org](https://www.gotopless.org) (n.d.). Recruitment and research procedures adhered to the American Psychological Association's (2017) ethical standards for research with human participants. All participants were volunteers; no direct incentives were provided.

Photo Rating Task

Stimuli

Photographs for this study were obtained through Internet image searches of women who were topless at public beaches, parks, or on city streets. The overarching aim that guided image selection was that the photos reflected a topless woman or women that a hypothetical participant could hypothetically see while also out in public. As prior research has elucidated a host of physique-driven explicit and implicit biases, including body shapes and sizes, skin tone, as well as perceptions of disability, age, and other factors (see Charlesworth & Banaji, 2019), the potential images were intentionally restricted to images of young-adult White women with similar physiques and hairstyles. Twenty-four images of similar size and resolution were carefully screened for inclusion. Two photos for each context (i.e., six total images) were selected based on the following criteria: a) depicted a woman (or women) with exposed breasts, but otherwise clothed, b) photo taken outdoors in a public setting

¹ Due to the methodological limitation created by assessing "participant sex," as opposed to gender identity, the terms "participant sex" and "sex difference" will be subsequently used to differentiate and refer to the hypothesized differences between men and women (i.e., Hypothesis 4). Greater consideration and the potential implications of suboptimal measurement in this way is treated in the Discussion.

Table 1 Sample demographics

Variable	Overall	Female	Male
<i>n</i>	326 ^a	253	70
Mean age (<i>SD</i>) in years	30.72 (8.84)	30.23 (8.27)	32.47 (10.53)
<i>Ethnic background</i>			
% White/Caucasian	90.4	90.0	91.4
% Hispanic or Latinx	3.1	3.2	2.9
% Asian/Pacific Islander	2.2	2.4	1.4
% Black	1.5	1.6	1.4
% Native American, AK native, or other	2.8	2.8	2.9
<i>Region of United States</i>			
% Midwest	36.0	34.0	42.6
% Southeast	22.5	21.9	26.2
% Mountain west	19.3	19.8	16.4
% Southwest	11.6	11.7	11.5
% Northeast	10.6	12.6	3.3
<i>Marital status</i>			
% Married	73.3	76.7	61.4
% Cohabiting	12.9	13.0	11.4
% Single	10.4	8.7	17.1
% Divorced	2.5	0.8	8.6
% Widowed or other	0.9	0.8	1.4
% Have had children	77.0	82.2	57.1
<i>Education</i>			
% High school, some college, or technical/associates	39.3	36.0	48.6
% Bachelor's graduate	36.8	39.2	30.0
% Post-graduate degree	23.8	24.8	21.4
<i>Household income</i>			
% Working/Lower-middle	32.8	31.4	36.2
% Middle class	44.0	44.6	42.0
% Upper/Upper-middle	23.3	23.9	21.7
<i>Religious frequency</i>			
% Never/Almost never	67.3	66.9	68.6
% A few times a year	15.7	16.3	12.9
% About once a month	2.8	2.0	5.7
% Two to three times a month	6.2	6.4	5.7
% Once a week or more	8.0	8.4	7.1

^aThree participants did not provide information regarding biological sex. Their data were excluded from the sex comparisons but retained for the overall sample

with no or few other people visible (i.e., faces of other people in the photo were not clearly visible to avoid influence of others' expressions), c) the woman in the photos displayed neutral facial expressions, and d) smoking, alcohol, children, or religious

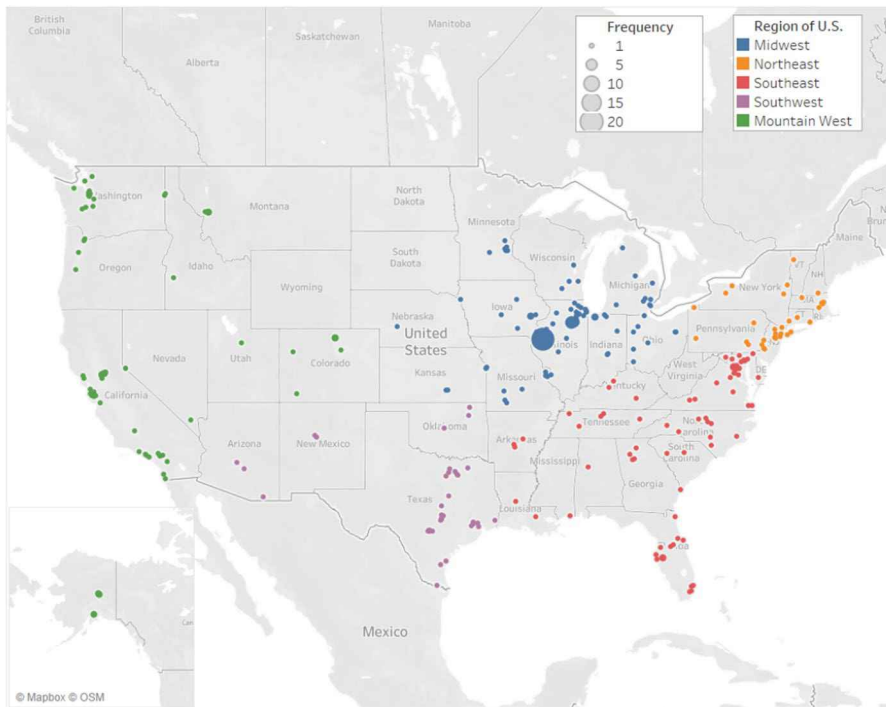


Fig. 1 Regional Distribution of Participants across the United States. Map constructed in Tableau (2020) using base maps, with permission, from © Mapbox and © OpenStreetMap. See <https://www.mapbox.com/about/maps/> and <https://www.openstreetmap.org/copyright/>

symbols (e.g., pendants) were not visible. Additionally, the women in the photographs were not posed in a sexually-suggestive manner, were neither celebrities nor models, and all images were taken without apparent use of photographic techniques or editing. Descriptions of the final photos are available in Table 2.

Ratings

The six final photographs were intermixed in a set of 60 images that depicted couples, children, families, and mothers breastfeeding as part of larger study. The order of the six photos, as well as their location within the larger set was randomized for each participant. Participants were asked to indicate their “impression or feelings when seeing each of the images” using an 11-point Likert type response scale, with *Very Negative Impression* and *Very Positive Impression* anchoring the left- and right-most response options. No anchors were associated with intermediate points. Participants were instructed to click on a “skip photo” button if they preferred not to provide a rating for any (or all) of the photos.

Table 2 Stimulus description and mean rating for each photo of topless women

	Public Context	Resolution (dpi)	Size (pixels)	Description	Associated Keyword/Tag	Mean Rating (SD)
1	City streets	72	336×407	Two topless women standing near busy intersection crosswalk; women holding bags and wearing pants/shorts	midriff	6.31 (2.75)
2	City streets	120	375×336	Topless woman standing on street with U.S. White House in the distance; wearing skirt with bag over her shoulder	cleavage	6.39 (2.80)
3	Park	72	448×300	Topless woman lying (on back) on a towel in the grass while reading a book; wearing skirt, stockings, and sunglasses	erotic	6.86 (2.66)
4	Park	72	365×336	Topless woman sitting in rowboat, with other boats in the distance; wearing shorts	leisure	6.86 (2.75)
5	Beach/Pool	120	336×412	Topless woman standing near water while carrying bikini top and sundries; wearing bikini bottom	cleavage	6.29 (2.71)
6	Beach/Pool	120	349×336	Topless woman sitting on towel on a sand beach, bikini top set to her side; wearing bikini bottom and hat	leisure	6.64 (2.65)

Associated keywords or tags were obtained using a reverse image search via Google Images. Ratings regarded general impressions of the photo ranging from (1) *Very Negative Impression* to (11) *Very Positive Impression*

Measures

Participants provided relevant demographic information, including biological sex (i.e., male/female), age, racial/ethnic background, zip/postal mail code, and current marital and parental statuses. Frequency of religious service attendance was assessed with the same question that was used in prior research (Fischstein et al., 2005), for which participants indicated how frequently they attend “organized religious services” with a 5-point response scale ranging from 1, *never*, to 5, *once a week or more*. Self-reported education level (with 7 options) and household income (with 5 options) were used to capture socioeconomic status, which was quantified for analysis by averaging *z*-scores of education and income level.

Disgust Sensitivity

In the interest of questionnaire brevity, disgust sensitivity was assessed using the three highest-loading items from Olatunji et al.’s (2007) Disgust Scale. Participants indicated *Not Disgusting*, *Slightly Disgusting*, or *Very Disgusting* for each the following experiences: “Walking through a graveyard,” “Seeing a cockroach in someone else’s house,” and “Knowing that the person who cooked your food had a cold.” Internal consistency for these three items was low at $\alpha=0.41$; the potential impact of this suboptimal measurement is further explored under the Limitations section.

Child Protectiveness

The same items also used in Harbke and Lindemann (2018) were used to assess Child Protectiveness Beliefs. Respondents indicated their level of agreement on a 5-point response scale ranging from 1, *Disagree Strongly*, to 5, *Agree Strongly* for each of four statements, such as “Parents should strive to protect their children’s innocence.” Cronbach’s α for these items was adequate at 0.62.

Ancillary Single-Item Indicators of Sexual Awareness and Attitudes

Sexual attitudes and awareness were assessed using the highest loading item for each of four subscales from the Brief Sexual Attitudes Scale (Hendrick et al., 2006) and the Sexual Awareness Questionnaire (Snell et al., 1991) for exploratory purposes. Sexual attitudes included *sexual permissiveness*, *egalitarian birth control*, *sexual communion*, and *sexual instrumentality*, and the sexual awareness items tapped *sexual consciousness*, *sexual monitoring*, *sexual assertiveness*, and *sex-appeal consciousness*. Each item was rated on a five-point Likert-type scale ranging from (1) *Strongly Disagree* to (5) *Strongly Agree*. Specific item content is displayed in Online Resources Table S1.

Participants also completed two other measures that were not utilized in the current investigation. The first pertained to opinions of legality of public toplessness, which have been previously reported (Harbke & Lindemann, 2018), and the second pertained to attitudes toward breastfeeding and formula feeding.

Procedure

After following a link to the survey, prospective participants read a cover page that described the purpose of the study in greater detail and cautioned that some images in the photo rating task would contain partial nudity, but that all photos were consistent with a PG-13 rating (or less) by the Motion Picture Association of America (2010). Those who indicated consent (via radio button) next read brief instructions for the photo rating task, proceeded to rate the photos, and then completed the demographic and attitudinal measures. The final page of the study reiterated the study's purpose, provided relevant contact information, and thanked participants for their voluntary contribution. Median participation time was 13.5 min.

Data Analysis

Primary data analysis entailed a series of multilevel regression models that were estimated via full information maximum likelihood. The specialized analytic software HLM (Version 6; Raudenbush et al., 2004) uses a combination of fixed and random effects to account for correlated data and is particularly well suited for analyzing nested data structures (i.e., multiple observations for each participant). This analytical approach allowed for simultaneous estimation of within-subjects (i.e., context) and between-subjects effects (e.g., regions, state legality, participant sex or other demographic differences; Bryk & Raudenbush, 2002). As the six selected images represented only a portion of all potential photos that could have been included, the associated ratings were modelled as a random effect. The five primary hypotheses were examined by comparing a model that systematically introduced the hypothesized predictors to a model that did not include them. Predictors that were associated with significant improvement in model fit (via comparison of deviance χ^2) were retained for the next hypothesis. Variance accounted for (VAF) by the newly introduced predictors was used as the primary effect size. Once the five hypotheses were sequentially examined, two additional exploratory models compared ancillary demographic (e.g., age, socioeconomic status) and single-item attitudinal variables and as potential predictors of reactions toward toplessness.

Results

Mean responses to the six photos of topless women are displayed in Table 2. Response distributions spanned the full range of possible values and were normally distributed for all six photos. In addition, responses made across the photos were highly reliable, Cronbach's $\alpha=0.96$. As would be expected, the highest correlations were consistently between the pair of photos that shared the same context, $r=0.84$ for beach or pool, $r=0.83$ for park, and $r=0.87$ for city street (vs. an overall mean inter-item r of 0.81). The "skip photo" option was exercised only once by one participant when rating the photo of a woman walking topless on the beach.

Table 3 Photograph and participant variance components for hypothesized effects

Hypothesis	Available n	Models Compared	Variance Components		k	Model Deviance
			Respondent-Level	Photo-Level		
1	326	Context	6.00	1.39	5	7258.13
		Intercept-only	5.99	1.46	3	7325.12
2	311	Regional differences	5.83	1.41	9	6922.22
		Context-only	5.88	1.40	5	6924.83
3	311	State legality	5.71	1.41	7	6915.92
		Context-only	5.88	1.40	5	6924.83
4	308	Sex differences	5.06	1.41	8	6818.14
		Context & state legality	5.75	1.41	7	6855.61
5	297	Previously identified predictors	4.68	1.43	11	6575.76
		Sex, state legality, & context	5.06	1.43	8	6597.97

Estimates obtained with k parameters using full maximum likelihood estimation. Model deviance is a chi-square distributed indicator of badness of fit (Hox, 2002); thus, the model with lower deviance provided better fit to the data. Change in deviance ($\Delta\chi^2$) and significance is reported in text for each comparison. Occasional omissions to individual items resulted in minor variations in sample size (n) that was available for each comparison

A baseline, intercept-only model was estimated to quantify the sources of variance in responses. The estimated intraclass correlation was 0.80, which indicates that 80% of the variance in ratings was between respondents (i.e., individual differences) and the remaining 20% could be attributed to differences in the photos (Hox, 2002). Table 3 displays the estimated variance components for each model.

Hypothesis 1: Effect of Context on Reactions toward Toplessness

As can be inferred from Table 2, mean ratings of Context on Reactions toward Toplessness for the photos did differ between contexts. Compared to the grand mean (of 6.55), responses to the park photos were, on average, 0.31 units higher ($SE=0.04$), $t(1947)=8.08$, $p<0.001$, and beach/pool photos were 0.09 units lower ($SE=0.04$), $t(1947)=2.51$, $p=0.01$. An omnibus comparison to the baseline, intercept-only model confirmed that the differences observed between context were significant, $\Delta\chi^2(2)=66.99$, $p<0.001$, and explained 4% of the variance in photo ratings.

Hypothesis 2: Regional Differences in Reactions toward Toplessness

Geographic differences across five regions of the United States (see Fig. 1) were tested by comparing the context-only model to a new model that included additional four effect-coded predictors to represent each participant's region. Geographic

region was not a significant predictor of attitudes, $\Delta\chi^2(4)=2.61$, $p=0.63$, and was associated with trivial increments in variance explained (0.8% of respondent-level variance). The coefficients associated with the various regions were all non-significant ($p>0.24$), although the coefficients representing context from Hypothesis 1 remained significant, $p<0.03$. Due to these null results, predictors that represented participants' region were not retained for subsequent models.

Hypothesis 3: Role of State Legality on Reactions toward Toplessness

Hypothesis 3 was also evaluated by comparing the context-only model to a new model that included two effect-coded predictors to differentiate whether public female toplessness was legal, had ambiguous legal status, or was expressly prohibited in the participants' state. State legality was significantly predictive of reactions toward toplessness, $\Delta\chi^2(2)=8.92$, $p=0.01$, and accounted for 2.8% of variance across respondents. Those from prohibitive states rated the photos, on average, - 1.10 units lower ($SE=0.46$) than the grand mean, $t(308)=2.39$, $p=0.02$. Additionally, participants from states where public female toplessness had ambiguous legal status reported a reaction that was, on average, 0.87 units ($SE=0.29$) more favorable, $t(308)=2.99$, $p=0.003$. Importantly, the context depicted in the photo remained significant in this model ($p<0.023$); subsequent comparisons included state legal status and context in reference models.

Hypothesis 4: Sex Differences in Reactions toward Toplessness

Including participants' biological sex was associated with significant improvements in model fit over the model from Hypothesis 3, $\Delta\chi^2(1)=37.47$, $p<0.001$. On average, male respondents rated the photos 2.08 units ($SE=0.33$) higher than female respondents, $t(304)=6.31$, $p<0.001$. Participant sex accounted for 12% additional variance, and the coefficients representing context and state legality also remained significant, $ps<0.023$. According to contemporary standards for individual differences research (Gignac & Szodorai, 2016), the magnitude of these sex differences would be classified as a "relatively large" effect.

Hypothesis 5: Religiosity, Disgust, and Child Protectiveness and Reactions toward Toplessness

The three demographic and attitudinal predictors that had been predictive of attitudes toward legality of toplessness in prior research were evaluated against Hypothesized Model 4. The combination of religiosity, disgust sensitivity, and child protectiveness beliefs were associated with significant increases in variance explained (8%), $\Delta\chi^2(3)=22.21$, $p<0.001$. As can be seen in Table 4, those who attended religious services more frequently, $t(290)=3.24$, $p=0.002$, and those who held stronger child protectiveness beliefs, $t(290)=2.16$, $p=0.03$, reported significantly less favorable impressions of the photos. Disgust sensitivity was also predictive of less favorable reactions, however, it was only marginally significant, $t(290)=1.90$,

Table 4 Final hierarchical regression model predicting reactions toward photos of topless women

Predictor	Coefficient	SE	df	t	p
<i>Photo-level predictors (Level 1)</i>					
Park context	0.31	0.04	1768	7.66	<0.001
Beach context	-0.09	0.04	1768	-2.24	0.025
<i>Respondent-level predictors (Level 2)</i>					
Stage legality					
Ambiguous statutes	0.70	0.27	290	2.56	0.011
Prohibitive statutes	-0.78	0.44	290	-1.78	0.075
Being male	1.87	0.32	290	5.76	<0.001
Religiosity	-0.34	0.10	290	-3.24	0.002
Child protectiveness	-0.43	0.20	290	-2.16	0.031
Disgust sensitivity	-0.24	0.13	290	-1.90	0.058
<i>Intercept</i>	5.98	0.24	-	-	-

Religiosity, Child Protectiveness, and Disgust Sensitivity were centered, state legality was effect coded, and participants' biological sex of male was dummy coded prior to entry. As such, the intercept coefficient represents the grand mean photo rating among female respondents with mean levels of religiosity, child protectiveness, and disgust sensitivity. $n=297$

$p=0.058$. Participant sex, being from a state with ambiguous state statutes, and the context of the photo all remained significant after the other predictors were included ($p<0.025$); however, being from states with prohibitive state statutes was no longer significant ($p=0.075$). This final hypothesized model (see Table 4) explained a total of 19% of respondent-level variance in reactions, an overall effect size that is twice the recommended guidelines for "relatively large" effects (Gignac & Szodorai, 2016). The context depicted in the photograph was associated with an additional 4% VAF in this final model.

Exploratory Models: Evaluation of Ancillary Demographic and Attitudinal Predictors

Two additional models were examined to explore the potential impact of demographic and attitudinal variables that had not been included in the hypotheses. The exploratory demographics model included participants' age, socioeconomic status, reported ethnicity (i.e., white or non-white), and marital (i.e., married or not) and parental status (i.e., having had children or not). As age and socioeconomic status were quantitative variables, both linear and quadratic terms were used to explore potential non-linear relationships between these variables and reactions toward toplessness. As can be seen in Online Resources Table S2, inclusion of the demographic predictors accounted for a significant, $\Delta\chi^2(7)=14.40$, $p=0.045$, increase in respondent-level variance explained (5%) relative to Hypothesized Model 5. Those

with higher socioeconomic status tended to hold less favorable reactions toward toplessness. Age was positively related to reactions, but the strength of this relationship decreased at higher ages (i.e., significant quadratic term). Being white, being married, and having had children were all non-significant. Coefficients from Hypothesized Model 5 were highly similar after accounting for these additional demographic predictors.

An additional 9% of respondent-level variance was explained when the single-item indicators of sexual attitudes and awareness were added to predict reactions toward toplessness, $\Delta\chi^2(8)=27.16$, $p<0.001$. Significant coefficients indicated that favorable attitudes toward sexual permissiveness and egalitarian views of birth control were both associated with positive reactions toward female public toplessness. The coefficients for religiosity and child protectiveness were reduced (relative to Hypothesized Model 5), albeit still significant, once sexual attitudes and awareness were controlled; a pattern that is consistent with religiosity and protectiveness beliefs overlapping (at least in part) with sexual attitudes. The coefficients for state legality were similarly decreased once individual differences in sexual attitudes and awareness were controlled (see Online Resources Table S2).

Discussion

Prior research regarding attitudes toward toplessness has emphasized opinions of women's legal right to go topless in public. The current study utilized reactions toward photographs as a more ecologically valid assessment that was not directly tied to legality. Moreover, obtaining ratings to multiple images for each participant allowed for the first-ever simultaneous comparison of contextual (i.e., beaches or pools, public parks, or on city streets), structural (i.e., region and state legality), demographic, and attitudinal factors as they relate to reactions to female toplessness.

Findings indicated that roughly 80% of variability in reactions toward female public toplessness can be attributed to individual differences. Based on prior legality-based research it was expected that context would be the strongest overall predictor of reactions; however, the strength of the relationship was smaller than anticipated (4 or 5% variance explained across all models), lending only partial confirmation of Hypothesis 1. The ordering of reactions to the photos across contexts also differed from prior legality-based research, for which approval tended to highest for beach or pool contexts (Fischtein et al., 2005; Harbke & Lindemann, 2018). Even so, the context depicted in the images still mattered, as photos of topless women in parks were viewed slightly more favorably than those on city streets or at beaches. A related context effect comes from studies of photos posted to social media. Specifically, participants expressed disapproval of photographs of girls and women in swimsuits if they were taken in their bedroom or bathrooms but approved of similar photos taken near a pool or on a beach (Daniels & Zurbiggen, 2016). Such contextual effects are also consistent with the notion of sexually objectifying environments (Szymanski et al., 2011) as an extension of objectification theory. Sexually objectifying environments are settings and social conditions that tacitly or intentionally set up conditions that encourage women's objectification (e.g., those that display traditional

gender-roles, or have disproportionately greater numbers of men). It is important to note the small effect sizes associated with context, however. The overall pattern we observed indicated that reactions toward toplessness are driven primarily by personal opinion, and the contextual setting in which the toplessness occurs plays a small role. Context may be more relevant for approval of legality, as has been shown in prior research (i.e., Fischtein et al., 2005; Harbke & Lindemann, 2018). Notably, the present study was the first to simultaneously assess and compare contextual factors to structural and individual-differences factors; thus, prior legality-based research that identified contextual differences in attitudes toward toplessness did so without a direct comparison to other potential predictors.

Structural Influences on Reactions to Female Toplessness

A key structural factor that was expected to predict reactions toward toplessness was geographic region. Contrasting findings from a Canadian survey (Fischtein et al., 2005) as well as Hypothesis 2, no regional differences in attitudes toward toplessness were identified across the United States. This null result reinforces the complexity of disparate rulings that have upheld bans in the 4th (Southeast; Chelsea Eline et al. v. Town of Ocean City, MD., 2020), 7th (Midwest; Tagami v. City of Chicago, 2017), and 8th Circuits (Midwest; Free the Nipple v. City of Springfield, 2019), yet simultaneously overturned similar bans in the 10th Circuit (Mountain West; Free the Nipple, Hoagland, & Six v. City of Fort Collins, 2017, 2019). Though differences across geographic regions were all non-significant, the same was not true when state legality was considered. Participants from states with ambiguous legal status of public female toplessness tended to react more favorably to the images, whereas those from states with prohibitive statutes tended to react more negatively to the same images. Confirming Hypothesis 3, this finding indicates that state legal status does predict individual reactions to seeing women topless in public, albeit with a small effect size (3% VAF). On a more global scale, the only comparison of attitudes toward toplessness across multiple countries (i.e., Canada, United States, Oceanic, European Union, and other countries) reported marginally significant differences in acceptance of public toplessness as women's legal right (Harbke & Lindemann, 2018), despite well-known variability in both legality and social acceptance of female toplessness across these countries. When personal reactions to pictures of topless women were considered, however, the results presented herein suggest that legal status (but not geographic region) influences how people are likely to respond, a pattern that confirms theoretical and empirical understanding of how laws, social norms, and morality can combine to impact attitudes toward other issues (e.g., smoking regulation, prostitution, & same-sex marriage; Bilz & Nadler, 2014; Kotsadam & Jakobsson, 2011; Ofosu et al., 2019; Tankard & Paluck, 2017). Understanding demographic and attitudinal predictors of how people react to seeing female toplessness may further elucidate for whom and how prevalent unfavorable (or favorable) attitudes toward female toplessness are across the United States.

Sex Differences in Reactions to Public Female Toplessness

The strongest single predictor of attitudes toward toplessness was participant sex (11% VAF). Male participants rated the photos more favorably irrespective of context, and participant sex remained strongly predictive after accounting for a host of other demographic and attitudinal measures in subsequent models. Thus, female participants responded more critically to seeing images of public female toplessness, confirming Hypothesis 4. This finding is consistent with prior legality-research by Fischtein et al. (2005) who also found sex differences but contrasts with Harbke and Lindemann's (2018) findings for whom sex differences were non-significant. An important caveat to these findings is that the demographics questionnaire assessed only binary biological sex rather than gender identity (see Footnote 1), which both limits and simultaneously complicates potential interpretations of this difference.

Specifically, the same observed sex difference can be interpreted in multiple ways. One interpretation is that the more favorable reactions reported by male participants (relative to female participants) reflects their objectification of the women in the photos. This aspect of objectification alone could account for the observed difference in how male and female participants rated the photos.

The same sex difference can also be interpreted as female participants rating the images less favorably because they were potentially policing other women's behavior as sexual objects (Riley et al., 2016; Szymanski et al., 2011). Feminist theory and empirical work has repeatedly linked patriarchal norms with an encouragement for women to compete on attractiveness (Wolf, 1991), status (Wang & Griskievicius, 2014), and for access to resources (Hudders et al., 2014). As just one example of these social dynamics, Moffitt and Szymanski (2011) identified competition among women as a key element of sexually-objectifying environments. Further, prior research has shown intrasex competition among women frequently manifests as indirect aggression (e.g., Österman et al., 1998), and that derogatory comments or character indictments (e.g., "slut shaming") are not only common competitive practices among women (Buss & Dedden, 1990), but also effectively decrease men's perceptions of other women's attractiveness (Fisher & Cox, 2009). In the case of the current study, the less favorable reactions to toplessness that were expressed by female participants may reflect, at least in part, these sort of competitive dynamics. Expressing moral objections to public female toplessness may then serve to rationalize one's own competitive and policing actions that may occur in otherwise non-competitive situations (e.g., between two strangers who happen to be on the same beach).

Both interpretations of the sex differences noted herein reinforce the core premises of objectification theory. The point of distinction between the alternative interpretations is where the onus for differing reactions to seeing a woman topless in public may fall. Males may find the practice appealing and reinforcing to women's sexual objectification and, thus, respond more favorably to it. Whereas females may find the practice competitive and respond with attempts to police it. Given that these differing reactions are predicted by objectification theory, the more likely explanation is that both processes cooccur and contribute to the complex array of opinions people hold toward public female toplessness. This pattern is also consistent with

findings from the Australian surveys, where women's legal right was widely supported yet only one-half of their sample reported that they had ever exercised that right (Herold et al., 1994). When viewed alongside findings from prior toplessness surveys, most women (and men) support women's legal right to go topless in public; even so, women may not be personally supportive of it for themselves or of seeing it around them. This discrepancy between beliefs and behaviors likely has important implications for equal rights advocacy.

The Role of Morality and Moral Norms in Reactions to Public Female Toplessness

Researchers have repeatedly concluded that for a subset of people public female toplessness may be viewed as a moral issue (e.g., Fischtein et al., 2005; Harbke & Lindemann, 2018; Herold et al., 1994, 1995). This pattern was replicated in the present research with multiple demographic and attitudinal factors, supporting Hypothesis 5. Moreover, once these morally-related predictors were included in the analysis, the coefficient associated with being from states with prohibitive toplessness statutes was no longer significant. Albeit unexpected, this change further evinces how legality and morality can have an overlapping influence on attitudes (see Bilz & Nadler, 2014). Religiosity has repeatedly been linked with negative sexual attitudes (e.g., Lefkowitz et al., 2004) and sex-related guilt (Murray et al., 2007), which implies moral objections. Studies of reactions to images on social media have also linked disapproval of images of other women or girls in swimsuits and underwear with character indictments and attributions that the women were seeking sexual attention (e.g., "kind of slutty;" Daniels & Zurbriggen, 2016, p. 950). The sentiments Daniels and Zurbriggen captured with their interviews regarding social media posts nearly match exactly those that Herold et al.'s (1994) noted among the minority of Australian women who expressed opposition to women's legal right to public toplessness. Moreover, these sorts of attributions are predicted by the policing role of other women in objectification theory (Riley et al., 2016; Szymanski et al., 2011) and the Madonna-whore dichotomy (e.g., Hartmann, 2009; Kahalon et al., 2019).

On the flipside of this dichotomy is the normative association of women as principal nurturers as represented in the Madonna archetype. Finding that those who held higher child protectiveness beliefs tended to rate images of topless women less favorably further substantiates this polarized perspective. This reasoning is also consistent with the "family-friendly" moral argument that led to Ocean City's prohibitive ordinance (Soper, 2019) and was echoed in U.S. Court of Appeals Chief Judge Breder's affirming opinion (*Chelsea Eline et al. v. Town of Ocean City*, 2020). Framing legal actions as "necessary to protect others" has successfully inserted an element of (a)morality into previously neutral issues (e.g., smoking; Bilz & Nadler, 2014) and such moral objections can shift attitudes, as well as social norms and behavior. Disgust sensitivity has also been linked with morality (e.g., Chapman & Anderson, 2013) and sensitivity to sexual disgust, in particular, is strongly associated with judgements of sanctity or purity, even more so than pathogen-based disgust (van Leeuwen et al., 2017). Although suboptimal measurement for the ancillary attitudinal items may have led to the marginally significant relationships we observed

(see Limitations below), the exploratory analyses demonstrated that the coefficient for disgust sensitivity was notably weaker once sexual attitudes and awareness were controlled (see Online Resources Table S2). Though additional work in this area is needed, such a pattern further reinforces prior research on the topic showing that, for a subset of the U.S. population, toplessness is viewed as a sex-related moral issue. Clearly, for some people, attitudes towards sexuality and toplessness are interrelated. Social and legal aims that disentangle female toplessness from sexuality could prove valuable for advocacy efforts and for equal rights.

Strengths, Limitations, and Future Directions

This study and the findings reported herein should be viewed in light of several methodological strengths and limitations. First, the photographs were intentionally selected to depict public toplessness in the same three contexts that have been explored in prior legality-based research (i.e., beaches & pools, public parks, and city streets). Moreover, the presentation of these images was experimentally manipulated through randomization within a larger set of photos. Thus, causal inferences regarding the effect of context on attitudes were tenable. That said, a small number of images in the public domain met inclusion criteria and the six final images did not encompass the full domain of topless women in these three contexts. We attempted to overcome this methodological limitation by treating the photos as a random effect in the primary analyses. Although the stimuli selection process attempted to exclude photos of women who were posed in a sexually-suggestive manner, the extent to which participants perceived them as being sexual in nature is unknown. Given that sexual attraction and perceptions of sexual interest are idiosyncratic, it is important to note that some of the photos may have been perceived as more sexual than other photos and that such attributions may have affected participants' responses. Also, efforts to maximize validity of the experimental manipulation also meant that the woman depicted in the images were similar regard to approximate age and body size, as well as skin tone and hair length. When evidence of prejudice and discrimination toward women with specific body shapes and sizes are considered (Charlesworth & Banaji, 2019; Puhl & Heuer, 2009), it is unclear from this research alone how attitudes toward toplessness may differ for women of other ages and with other body shapes, skin tones, or other factors. Replicating these findings with a larger selection of photos that depict a more diverse population of women is important. Adding images of women who are not topless (e.g., wearing a two-piece swimsuit) or images of bare-chested men in similar contexts could introduce other potentially informative comparisons.

Given the use of convenience sampling, the extent to which the usable sample represents the underlying U.S. population is unknown. In addition, the sample was selected from a larger study regarding parenting and breastfeeding, with many participants having already had children (77%) or currently trying to have children (9%). Notably, these values are in line with statistics for women in the general U.S. population, where 85% report having had children by ages 40–44 (Frejka, 2017). Even though male-oriented parenting websites (e.g., dadzclub.com, “dadit” subreddit on

Reddit.com) were targeted for recruitment, the usable sample was disproportionately female. With previously demonstrated sex differences in attitudes toward toplessness (Fischtein et al., 2005), the analytical approach used herein controlled for sex differences before any other demographic or attitudinal variables were considered. An important caveat for these findings is that the demographics questionnaire assessed only binary biological sex rather than gender identity. Given the magnitude of the observed sex differences (11% VAF), future research should consider gender identity as a potential moderator of contextual or other factors (e.g., age, sexual attitudes). In light of the inherent interpretative shortcomings with two-group comparisons (i.e., did females rate the images less favorably, males rate them more favorably, or both?), non-binary measurement of gender identity could provide an important window for better understanding of such differences. Future research regarding attitudes toward public toplessness should strive to include greater diversity of gender identity, as well as sample sizes that are sufficient to interpret multiple-group comparisons across this variable. The current study also did not assess participants' sexual orientations, which is another demographic factor that – especially when combined with gender identity – may prove highly valuable for understanding attitudes toward toplessness.

Another limitation can be sourced to the research team's efforts to minimize task demands for the all-volunteer sample. Disgust sensitivity was measured using three items from the original 25-item scale and the exploratory analyses pertaining to sexual attitudes and awareness were based on individual items. Despite suboptimal measurement of disgust sensitivity (part of Hypothesis 5) and sexual attitudes and awareness (part of the Exploratory Analyses), it should be noted that the omnibus tests for these models were still significant. As lack of reliability attenuates regression coefficients and effect sizes (Hunter & Schmidt, 2004), the estimates presented herein and in Online Resources Table S2 for these constructs should be viewed as lower bounds of the actual relationships. This is particularly true for the null results that were observed for the four sexual awareness items. It should be noted that the representative items for these constructs were carefully selected to provide the best reflection of the underlying construct (i.e., highest factor loadings). Moreover, internal consistency of the photo ratings that served as the dependent variable was very high. Potential measurement issues may have also been created for the grouping of the various states into geographic regions or how state legal status was coded from zip code. Multiple geographic classification systems exist for the United States (e.g., the Census uses 4 regions that are further subdivided into 9 divisions) and participants' personal knowledge of the relevant state or local laws was not assessed. Use of a different or more refined regional classification system and drawing on participants' knowledge of local legality may have led to different results. Future work with a nationally representative sample could also lead to a more robust examination of regional or statutory differences.

Conclusions

Though there is some clear overlap, reactions to seeing women topless in public may be more complex than self-reported approval of legality. When measured using a photo rating task, personal opinions seemed to be the driving force in reactions to toplessness, although the context and state legal status each also showed relatively small, albeit still significant, predictive ability. Consistent with policing elements of objectification theory, the strongest overall predictor of unfavorable reactions was, somewhat paradoxically, being female oneself. The overall pattern of predictors also implies that, for a subset of people, seeing a woman topless is associated with sexuality and is likely to elicit moral judgements (attitudes) or character indictments (behaviors). This interpretation is not only consistent with past research and feminist theory, but also rationales and commentaries regarding prohibitive legal statutes and policies. As one example of how social and equal rights issues can be drawn into the legal realm with unpredictable outcomes, the relatively understudied facet of female public toplessness may provide a window to comprehend how legal actions, social norms, and morality intertwine to shape attitudes and behavior. Better understanding of how demographic and attitudinal factors combine with legality to affect attitudes toward public female toplessness may extend to and elucidate a multitude of other equal rights and social issues.

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Authors Contribution Both authors contributed to the design and implementation of the research project that is summarized in the associated manuscript, “Objectification and Reactions Toward Public Female Toplessness in the United States: Looking Beyond Legal Approval.” The first draft of the manuscript was written by Colin R. Harbke and both authors contributed to editing and revising the manuscript. Both authors approve of its content.

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Data Availability The data summarized in the associated manuscript, “Objectification and Reactions Toward Public Female Toplessness in the United States: Looking Beyond Legal Approval” are available via the Center for Open Science. The annotated datafile is in SPSS format (*.sav) and can be accessed at the following address: <https://osf.io/dyg26/>

Declarations

Conflict of interest The authors have no financial interests or conflicts of interest to disclose.

Consent to Participate All participants were treated in accordance with the Ethical Principles of Psychologists and Code of Conduct of the American Psychological Association (2017), which included a complete description of the potential risks, benefits, and anonymity protections as part of the consent procedures. The same information was repeated at the end of the study, at which time the volunteer participants were also thanked for their contribution. Participants consented to participate via radio button prior to accessing the photo rating task and associated questionnaires.

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