This research examined how implicit attitudes are associated with cognitive processing and self-reported evaluation of advertisements featuring same-sex couples. Hypotheses were posited using the theoretical framework of Social Identity Theory (Tajfel and Turner 1986) and perspectives on implicit attitudes. In Study 1 participants watched and evaluated 10 television advertisements while physiological measures of cognitive and affective processing were collected. Ads varied such that half used same-sex couples as protagonists while the other half used other-sex couples. Participants demonstrated less positive responses to ads featuring same-sex couples. Physiological and self-reported responses were associated with implicit attitudes toward homosexuality; negative implicit attitudes were associated with more negative affect, less attention, less positivity, and less liking to ads featuring same-sex couples. Two subsequent studies replicated these findings in non-student samples, indicating that participants preferred ads with other-sex couples (Study 2) and that implicit attitudes were associated with this response (Study 3). This research suggests that implicit attitudes affect processing and evaluation of ads featuring same-sex couples in ways unaccounted for by explicitly-measured attitudes. Results are discussed in terms of advancing theory, furthering understanding of the dynamic processing of ads featuring in-group and out-group members, and practical implications.

Keywords: advertisements, emotion, cognition, implicit attitudes, gay imagery

Advertisements featuring lesbian, gay, bisexual, and transgender (LGBT) imagery have traditionally been confined to niche markets (Elliott 2013). It is estimated that American LGBT purchasing power is near $1 trillion, a level comparable with other minority groups (Green 2016). Additionally, the legalization of same-sex marriage in the United States in 2015 reflects increasing acceptance of LGB communities in American society. This buying power, in conjunction with increasing support for LGB individuals, has led to a rise in the number of ads featuring overt LGB imagery in mainstream U.S. media outlets (Atkinson 2003; Elliott 2013; Tuten 2006). For example, an ad in Ray-Ban's 2007 "Never Hide" campaign featured two men holding hands as they crossed the street. In 2012, an advertisement for the Gap featured two men inside one T-shirt with the line "Be One" (Klara 2013). Some research indicates that ads featuring gay imagery alienate heterosexual audiences (Angelini and Bradley 2010; Bhat, Leigh, and Wardlow 1998; Hooten, Noeva, and Hammonds, 2009) and that negative explicit attitudes toward homosexuality enhance this effect (Hester and Gibson 2007; Um 2014). The present study assesses individual differences of implicit attitudes toward homosexuality and cognitive and affective processes that underlie responses to ads containing gay imagery to provide further insight in consumer cognition and behavior in this context.

While some research indicates that explicit attitudes toward homosexuality affect responses toward ads featuring gay imagery (Hester and Gibson 2007; Um 2014), implicit attitudes can add further insight into consumer behavior, beyond that provided by explicit attitudes (Brunel, Tietje, and Greenwald 2004). Implicit attitudes are activated without intention or awareness (Dasgupta, 2009). Although an individual may not be aware of or endorse their implicit attitudes, research demonstrates that implicit attitudes affect behavior (Dunton and Fazio 1997; Plant and Devine 1998). Thus, the present research had two aims: (1) to investigate

cognitive and affective processing of ads that reveal the sexual orientation of male same-sex couples and (2) to examine the extent to which heterosexual consumers' implicit attitudes toward homosexuality are associated with processing and evaluation of these ads. In order to do so, we conducted three studies to assess self-reported attitudes and physiological responding to ads featuring gay imagery.

SOCIAL IDENTITY THEORY, PHYSIOLOGICAL RESPONDING, AND GAY IMAGERY IN ADS

According to Social Identity Theory (SIT; Tajfel and Turner 1986), group memberships provide social identity – a sense of self-image that derives from perceived belonging in social categories. Social categories can be based on any number of demographic characteristics, including sexual orientation, race, and gender. People maintain or enhance social identity through intergroup comparisons that favor the in-group (i.e., the group with which they identify). Negative attributes are ascribed to out-group members (i.e., people who do not belong to one's in-group) in order to maintain perceived superiority of the in-group (Tajfel and Turner 1986). Consistent with SIT, Angelini and Bradley (2010) found that ads featuring gay and lesbian imagery provoked negative self-reported emotional responses in heterosexual consumers. Hooten and colleagues (2009) showed that ads with gay and lesbian imagery not only evoked negative emotional responses, but also decreased heterosexual participants' intentions to purchase the products featured in the ads.

Although, in general, heterosexual audiences have seemed to prefer ads featuring in-group members, some research indicates that individual differences in explicit attitudes toward homosexuality influence how heterosexual people respond to ads with gay imagery (Bhat, Leigh, and Wardlow 1998). For example, Bhat and colleagues (1998) found that ads with gay imagery

produced strong negative emotional responses in those with negative attitudes toward homosexuality, but not for those without such attitudes. Um (2014) found that explicit attitudes toward homosexuality affected how heterosexual participants felt about ads featuring gay imagery but that, overall, participants still preferred ads without gay imagery. Consistent with these findings, we expected that heterosexual participants would report preference for ads featuring the in-group (other-sex couples), compared to ads featuring the out-group (same-sex couples), regardless of their attitudes toward homosexuality. Thus:

H1: Heterosexual participants will report lower liking, positivity ratings, and purchase intentions and more negativity toward ads featuring same-sex couples compared to ads featuring other-sex couples.

We also expected that SIT-consistent preferences for ads featuring the in-group would be reflected in physiological responses that correspond to indicators of advertising effectiveness (e.g., emotion, attention, and arousal). Some studies indicate that physiological responses to ads are better predictors of certain types of consumer response than self-report (e.g., LaBarbera and Tucciarone 1995; Hazlett and Hazlett 1999). Psychophysiological measures can reveal physiological substrates underlying consumer behavior (Berkman and Falk 2013), providing insight into explanatory mechanisms underlying communication (Weber, Mathiak, and Sherry 2008). Little is known about the specific cognitive and affective mechanisms associated with processing of ads that vary in the presence of same-sex couples versus other-sex couples. Thus, our first study employed psychophysiological measures of cognitive and affective processes, including facial electromyographic (fEMG) responses in the corrugator muscle region as a measure of negative affect, heart rate (HR) deceleration as a measure of attention, and skin

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conductance (SC) as a measure of arousal to investigate these mechanisms (Potter and Bolls 2012).

fEMG in the corrugator muscle region was employed as a covert measure of negative affect. Activity in the corrugator muscle region produces furrowing of the brow often associated with negative affective states (Blascovich et al. 2011; Boucher and Ekman 1975; Keltner and Ekman 2000). Facial EMG measures electrical potential changes that result from this muscle contraction, even when this movement is visually imperceptible (Hess 2009). Previous research indicates that ads with gay imagery evoke negative emotional responses in heterosexual consumers that are evidenced in self-reported attitudes (Angelini and Bradley 2010; Hooten, Noeva, and Hammonds 2009; Um 2014). We expect that this negative emotional response will also be reflected in fEMG activity of the corrugator muscle associated with negative affect. Thus:

H2: Heterosexual participants will demonstrate more negative affect to ads featuring same-sex couples compared to ads featuring other-sex couples.

HR deceleration, or decreases in HR after exposure to a stimulus, is a physiological measure indicative of attention (Lang 1994; Potter and Bolls 2012). HR deceleration is reflective of a "rest and relax" state in which people attend to external mediated stimuli. In contrast, higher HR indicates greater disengagement from aversive messages (Lang, 1994). Based on previous research, we predict that those with more negative implicit attitudes toward homosexuality will view the onset of same-sex couples as a moderately aversive representation of an out-group, which will be reflected in HR (Blascovich et al. 2001). This will result in decreased attention (increased HR) to ads featuring same-sex couples. Thus:

H3: Heterosexual participants will demonstrate less attention to ads featuring same-sex couples compared to ads featuring other-sex couples.

SC measures the ease with which a small constant voltage is conducted across two electrodes placed on the surface of the skin—often the palm of the hand, where human eccrine sweat glands are highly concentrated (Potter and Bolls 2012). In other words, SC indicates a sweat response associated with physiological arousal. When an individual is nervous or highly excited, SC increases. Because research indicates that arousal is increased in response to out-groups in virtual environments (Dotsch and Wigboldus 2006) we expected that this would also be the case in response to out-groups in ads. Specifically:

H4: Heterosexual participants will demonstrate more arousal to ads featuring same-sex couples compared to ads featuring other-sex couples.

IMPLICIT ATTITUDES TOWARD HOMOSEXUALITY AND GAY IMAGERY IN ADS

Implicit measures of attitudes toward homosexuality may provide further insight into heterosexual consumers' responses to ads featuring gay imagery. Some research indicates that implicit measures elucidate information about consumer response that is different from information revealed by explicit measures, especially when social desirability is a concern (Brunel, Tietje, and Greenwald 2004). Implicit attitudes operate below conscious awareness, and some may be unintentionally circumstantial and relatively automatic. Devine (1989) suggests that responses to out-groups consist of a dual process in which automatic and controlled processes are distinct and dissociable. Specifically, through socialization, culturally held stereotypical beliefs are passively learned and incorporated into mental representations of social groups, which form the foundation for implicit bias. Exposure to a member of a stereotyped group results in the automatic activation of these stereotypical beliefs (i.e., implicit attitudes),

which can, in turn, influence thoughts and behavior. However, an individual's personal values (i.e., explicit attitudes) about social groups are not necessarily consistent with automatically activated attitudes. Thus, it is possible that a person with negative implicit attitudes may hold explicit personal goals of egalitarianism. In other words, people may be affected by societal stereotypes (i.e., through automatic processes) that they do not personally endorse (i.e., through controlled processes; Devine 1989). Importantly for advertising, even though people may not personally endorse their implicit attitudes, these subconscious attitudes have the potential to influence behavioral outcomes (Dovidio et al. 2010).

There are few studies that examine the association of implicit attitudes and attitudes toward advertising. However, there is a need for implicit attitudes to be used as an independent variable to further understanding of consumer responses, particularly when socially desirable responding is a concern (Brunel, Tietje, and Greenwald 2004). For example, Brunel et al. (2004) found that when white spokespersons were used in ads, white participants demonstrated an implicit, but not explicit, preference for these messages. The authors posit that explicit measures were susceptible to socially desirable responding and thus did not reflect this preference. They conclude that implicit attitudes are able to reveal consumer behavior effects that explicit measures do not. Furthermore, the authors state implicit attitude measures "…could provide evidence that even when explicit measures suggest that racial or other biases do not exist, consumers may hold strong stereotypes, and these situations may need special attention" (Brunel, Tietje, and Greenwald 2004, p. 400).

Because previous research indicates that explicit attitudes are associated with consumer response to ads with gay imagery (Angelini and Bradley 2010; Hooten, Noeva, and Hammonds 2009), but explicit attitudes diverge with implicit attitudes when social desirability is a concern

(Brunel, Tietje, and Greenwald 2004; Fazio and Olson 2003), the present study examines how implicit attitudes toward homosexuality are associated with attitudes toward ads with gay imagery. However, because self-reported attitudes toward ads are subject to top-down cognitive control it is unclear how they may be related to implicit attitudes in this context. Thus:

RQ1: Are implicit attitudes toward homosexuality associated with self-reported measures of positivity, negativity, liking, and purchase intention for ads featuring same-sex couples?

Compared to self-reported consumer attitudes, physiological measures have the advantage of measuring reactions in real time, limiting cognitive bias, something that is especially important in assessing response to ads that occur over time (Poels and Dewitte 2006). Furthermore, psychophysiological measures do not require conscious and elaborate processing of ads that may affect participants' responses and are, therefore, not dependent upon conscious introspection that may lead to socially desirable responding (Guglielmi 1999; Poels and Dewitte 2006; Pozharliev, Verbeke, and Bagozzi 2017). Thus, we pose hypotheses about the association between implicit attitudes and physiological responses indicative of negative affect, attention, and arousal to ads featuring gay imagery:

H5: Greater negative implicit attitudes toward homosexuality will be associated with more negative affect to ads featuring same-sex couples and less negative affect to ads featuring other-sex couples.

H6: Greater negative implicit attitudes toward homosexuality will be associated with less attention to ads featuring same-sex couples and more attention to ads featuring other-sex couples.

H7: Greater negative implicit attitudes toward homosexuality will be associated with more arousal to ads featuring same-sex couples and less arousal to ads featuring other-sex couples.

STUDY 1

Study 1 was designed to investigate in-group preference in heterosexual consumers'
responses to ads with same-sex couples (H1-H4) and how implicit attitudes affect these
responses (RQ1; H5-7) using both self-report and physiological measures.

Method

Stimuli. A search of the video sharing website YouTube.com identified ads from five
common product categories regularly purchased by the types of consumers who served as study
participants (cereal, computer tablets, cars, carbonated beverages, tortilla chips). Ads were
selected such that each product employed two very similar ads: one featuring same-sex couples
and one featuring other-sex couples as the main protagonists. None of the ads featured
disgruntled couples. All ads featured white actors to control for confounds of race. All ads
featuring same-sex couples included male-male pairs. The creative strategy for each ad included
a moment in which the sexual orientation of the couple was unambiguously revealed. A group of
three graduate students and one professor of varying cultural backgrounds evaluated and selected
the ads based on group consensus of the features of the ads listed above (e.g., matched products,
sexual orientation, reveal moment, race). In the within-subjects design of Study 1, participants
saw all ten ads, which were randomized within the stimulus presentation software such that each
participants saw a different sequence of ads.

Dependent variables. Because psychophysiological hypotheses focused on cognitive and
emotional responses to the sexual orientation of the couple appearing in the ad, the point in time
in which the sexual orientation of the couple is revealed to the viewer was selected as the
moment of interest. Physiological data are presented in relation to this 'reveal moment.' The
dynamic and particular nature of each physiological measure, however, required that the

particular duration be guided by visual inspection of the response curves time-locked and collapsed to this reveal point collapsed across the commercial messages. This duration is provided below (Appendix 1 provides further explanation of how data were collected for each physiological measure).

Facial electromyography (fEMG) data were collected from the corrugator supercilii muscle region (above the eyebrow); a muscle in which activity is positively associated with negative affect (Blascovich et al. 2011; Boucher and Ekman 1975; Keltner and Ekman 2000). Statistical analyses were performed on the fEMG data for 6 seconds following each reveal moment. Electrocardiogram (ECG) data were collected by sensors on the inner forearms, with ECG being converted to heart rate (HR) offline. Statistical analyses were performed on the HR data for 10 seconds following each reveal moment. Skin conductance (SC) data were collected from participants' nondominant hands. Statistical analyses were performed on the SC data for 6 seconds following each reveal moment.

Four questions addressed attitudes towards the ads. As used by Hooten and colleagues (2009), questions were "How much do you like this advertisement?" and "Does this advertisement make you want to purchase this product?" Participants also reported positive and negative affect in response to each ad using two questions: "How positive did this advertisement make you feel?" and "How negative did this advertisement make you feel?" The four questions were presented in a randomized order after each ad. Responses to the questions were reported on a 1 (*not at all*) to 7 (*very much*) scale.

Individual Difference Variables. Demographic questions were administered to assess age, race/ethnicity, gender, sexual orientation, and major and year in school.

To determine implicit attitudes, the Sexuality Implicit Associations Test (IAT; Greenwald, McGhee, and Schwartz 1998) was administered. In this test, response times pairing positive words (e.g., joyful, beautiful, marvelous) or negative words (e.g., agony, terrible, horrible) with symbols and images of gay people or symbols and images of straight people were calculated to determine the extent to which participants implicitly associated these concepts (Nosek et al. 2007). During this task, participants were asked to categorize the stimuli presented on a computer monitor. On each trial, a target word or image was presented in the center of the computer window. Participants categorized each word or image by pressing a computer key on the left or right of the keyboard. During each block, category labels were presented in the upper left or upper right of the computer window. Participants were instructed to make judgments as quickly as possible and to avoid errors.

Each participant completed 7 blocks consisting of 40 trials. IAT scores were calculated by comparing the difference in response latency between two critical blocks: one in which "gay" was paired with "pleasant" (and "straight" was paired with "unpleasant") and the other in which "straight" was paired with "pleasant" (and "gay" was paired with "unpleasant"). Faster pairing of negative words, compared to positive words, with images of gay people or symbols indicates that one implicitly associates gay people with negative concepts and is used to operationalize generally negative implicit attitude towards homosexuality. Scores were calculated in accordance with the IAT scoring procedures of the improved algorithm (Greenwald, Nosek, and Banaji 2003). High scores indicate more negative attitudes toward homosexuality in that participants were slower to pair "gay" and "pleasant" compared to "straight" and "pleasant."

To assess explicit attitudes toward homosexuality, the ATLG-R (revised short version) was administered (Herek 1988, 1994). A sample question from the scale includes "I think male

homosexuals are disgusting." The scale includes two subscales, the attitudes towards gay men (ATG-R-S5) and the attitudes towards lesbians (ATL-R-S5) subscales, each consisting of 5 questions. Participants responded to a total of 10 items on a 1 (*strongly disagree*) to 5 (*strongly agree*) scale. Responses were averaged to create an overall ATLGS score per participant. Scores range from 1 to 50, with high scores indicating increased negative attitudes towards gay men and lesbians.

Participants and design. Undergraduate participants (n = 94) were recruited from introductory Communication courses at a large Midwestern university and received course credit for participation. Reasonable alternatives for credit were available. All participants were treated in accordance with ethical guidelines set forth by the university's institutional review board (IRB) and the American Psychological Association (APA). Eight participants reported a sexual orientation other than heterosexual and were eliminated from analyses because the theoretical framework (Social Identity Theory; SIT) posits an explanation for the nature of response to out-group members by in-group members, which in our hypotheses were homosexual and heterosexual respectively. Removal of these participants meant a final total of 86 (50 women). The mean age of participants was 20 (*SD* = 1.08). Most participants reported that they were Caucasian (*n* = 70) with the others reporting their race as Asian (*n* = 9), African American, (*n* = 4), or other race (*n* = 3).

Study 1 employed a 2 (Ad Type) X 5 (Brand) within-subjects design. Ad Type had two levels, ads containing same-sex couples as central to the narrative and ads containing other-sex couples as central to the narrative. There were five levels in the Brand factor representing five messages of each Ad type. Although we were not interested in the effects of specific brands, the Brand factor was included as a message repetition factor of each Ad Type to increase

generalizability of the findings. Because participants may have pre-existing attitudes toward brands and products that may affect responses, we included this factor as random in our analyses. IAT scores served as a quasi-experimental independent variable.

Procedure. Study 1 was promoted as a research opportunity assessing attitudes towards (ads for?) commercial products. Once in the experimental setting, participants signed an informed consent form and were seated in a room facing a 52-inch television screen with a computer attached. The psychophysiological recording sensors for fEMG, ECG, and EDA were explained and applied. Participants were then left in the experimental room alone to view the 10 ads in a randomized order presented on a computer using MediaLab software (Jarvis, 2016). Participants were still within hearing range of the experimenter sitting in an adjacent room, in case any questions or concerns arose.

At the conclusion of each ad, participants answered questions about attitudes toward the ad they just saw using the computer mouse and keyboard. After each set of questions, a screen with the phrase "please sit back and relax, a new ad will play shortly" appeared for 3 seconds. At the conclusion of the ad presentations, participants completed demographic information and then were randomly assigned to a presentation order of the ATLGS and the Sexuality IAT. Participants were debriefed about the true nature of the study, thanked, and excused.

Results

Data reduction. The moment in which the sexual orientation of the couple in the ad was revealed was selected as the point of interest within the commercial for the physiological dependent variables. Data were extracted in half-second intervals for the second before and 10 seconds after this point. The two half-seconds before onset of point of interest were averaged to

create a baseline and change scores were calculated by subtracting each subsequent half-second from the baseline.

Social identification and self-reported attitudes toward the ad. The first hypothesis expected that self-reported attitudes toward the ads would be less positive (i.e., decreased liking, positivity, and purchase intention and increased negativity) for ads featuring same-sex versus other-sex couples, reflecting preferences for the in-group as predicted by Social Identity Theory (SIT). A 2 (Ad Type) X 5 (Brand) repeated measures ANOVA statistically supported this hypothesis (refer to Table 1 for all means and standard deviations). Participants liked the ads with other-sex couples better than the ads with same-sex couples, $F(1, 85) = 4.68$, $p = .033$, $\eta^2 = .052$. Participants felt more positive following ads with other-sex couples than following ads with same-sex couples $F(1, 85) = 10.34$, $p = .002$, $\eta^2 = .108$. Participants also had greater intention to purchase the product featured in ads with other-sex couples compared to ads with same-sex couples $F(1, 85) = 14.26$, $p < .001$, $\eta^2 = .144$. There were no statistically significant differences between the negativity ratings for the ads with same-sex couples and the ads with other-sex couples ($p = .18$). These findings provide partial support for hypothesis 1 and indicate that preferences for the in-group were reflected in positively-worded but not negatively-worded questions.

<center>TABLE 1 ABOUT HERE</center>

The first research question asked whether SIT could be further supported by way of response to ads featuring same-sex couples and the level of negative implicit attitudes the participants had toward homosexuality as indexed by the sexuality IAT. A linear regression analysis was used to examine if scores on the sexuality IAT significantly predicted self-reported responses to advertisements with same-sex couples. IAT scores significantly predicted liking

(b=-3.34, t (84) = -2.64, p = .01) and explained 7.7% of the variance for liking of the ads featuring same-sex couples (R^2 = .077, F (1,84) = 6.99, p = .01). IAT scores also significantly predicted positivity (b = -2.78, t (84) = -2.62, p = .01) and explained 7.6% of the variance for positivity to the ads featuring same-sex couples (R^2 = .076, F (1,84) = 6.87, p =.01). However, IAT scores did not significantly predict purchase intentions (b = -2.04, t (84) = -1.63, p = .107) or negativity (b = -.52, t (84) = -.58, p = .565). Thus, regression results show negative implicit attitudes toward homosexuality were associated with decreased likelihood of participants' reporting positive responses to ads featuring same-sex couples. Implicit attitudes were not associated with purchase intentions or with negativity.

Social identification and physiological responding. Multilevel modeling (MLM) analyses were conducted on the physiological data because this approach allows for continuous predictor variables and preservation of physiological changes from resting state (i.e., phasic activity) while taking into account repeated measures (Page-Gould 2017). A separate MLM was run for each of the physiological dependent variables each using a first-order autoregressive (AR1) covariance matrix and the Satterthwaite method of estimating degrees of freedom. First-order autoregressive covariance structure is the most appropriate for repeated-measures physiological data because it accounts for systematic changes in the relationship between variances (Field 2009; Page-Gould 2017). Based on guidance provided by Page-Gould (2017), the fixed effects for the multilevel linear model for the physiological analyses were sexual orientation of the couple in the ad, time, implicit attitudes, and the orientation by implicit attitudes interaction. Brand was the random effect in the model. Both intercepts and slopes were allowed to vary randomly. Analyses for the multilevel linear model are reported according to the conventions described in Field (2009). Estimated marginal means and standard deviations are provided in Table 1.

MLM results from the facial electromyography (fEMG) data responded to the second and fifth hypotheses. Hypothesis 2 expected that negative affect (as indicated by fEMG activity of the corrugator muscle) would be greater for ads featuring same-sex couples compared to ads featuring other-sex couples. Hypothesis 5 expected an interaction between Implicit Attitudes and Ad Type on the physiological indicator of negative affect. Operationally, then, we predicted (1) high negative implicit attitudes would be associated with increased corrugator region activity after the reveal of same-sex couples and (2) high negative implicit attitudes would be associated with decreased corrugator activity after the reveal of other-sex couples.

A baseline model was run with only a fixed and random intercept to calculate an intraclass correlation coefficient (ICC; Page-Gould 2017). The ICC for the model was .06, which is classified as a very small effect (Cohen 1992) and potentially indicates that observations are independent of each other. However, MLM was still conducted because it is the most appropriate analytic strategy to maximize the amount of variance explained in the analysis, particularly when using psychophysiological dependent variables. Furthermore, it allows for the use of a continuous predictor variable while preserving the over-time nature of the physiological data (Page-Gould 2017). Sexual orientation of the couple in the video significantly predicted corrugator region activity to the ads, $F(1, 15798.65) = 197.19$, $p < .001$. Overall, participants demonstrated greater corrugator activity (more negative affect) to ads featuring other-sex couples compared to ads featuring same-sex couples. This is opposite of what was expected; thus, hypothesis 2 was not supported. Time was not significant in the model, $F(1, 34.47) = .90$, $p = .35$. Implicit attitudes did not significantly predict corrugator region activity to the ads, $F(1, 2.71) = 2.71$, $p = .10$. However, the interaction of sexual orientation of the couples in the ads and implicit attitudes of the participant was significant, $F(1, 15796.35) = 18.30$, $p < .001$ and

potentially explains the main effect in the unexpected direction. Interpretation of the slopes of ads with both same- and other-sex couples indicates a positive relationship between implicit attitudes and corrugator region activity such that higher IAT scores were associated with greater corrugator region activity. In other words, as implicit attitudes became more negative (IAT scores increased), negative affect increased to ads with both same- and other-sex couples. However, the slope for corrugator activity to the same-sex couples was steeper, indicating that more negative implicit attitudes were associated with a greater increase in negative affect for ads with same-sex couples compared to ads with other-sex couples. Because participants with high negative implicit attitudes toward homosexuality demonstrated more negative affect to both ad types, hypothesis 5 was partially supported.

<div align="center">FIGURE 1 ABOUT HERE</div>

MLM results from the heart rate (HR) data responded to the third and sixth hypotheses. Hypothesis 3 predicted that participants would demonstrate less attention to ads featuring same-sex couples than ads featuring other sex couples. Hypothesis 6 expected that those high in negative implicit attitudes toward homosexuality would view the reveal of a same-sex couple as an example of an out-group and therefore disengage attention from ad processing, as indicated by HR acceleration. We predicted that the appearance of a same-sex couple in ads would present non-threatening novelty for viewers with low negative implicit attitudes toward homosexuality. Operationally, then, for Hypothesis 6 we predicted that (1) more negative implicit attitudes would be associated with increased HR after the same-sex couples reveal and (2) more negative attitudes would be associated with decreased HR after the other-sex couples reveal.

The ICC for the model was .12, which is classified as a small effect (Cohen 1992) but is consistent with the ICCs reported in psychophysiological research and is above the threshold

(*ICC* < .10) for assuming that observations are independent of each other (Page-Gould 2017). Ad type did not significantly predict HR to the ads, F (1, 13900.65) = 3.53, p = .06. Hypothesis 3 was not supported. Time was not significant in the model, F (1, 21.20) = 2.01, p = .17. Implicit attitudes did not significantly predict HR to the ads, F (1, 239.77) = .47, p = .49. The interaction of Ad type and implicit attitudes of the participant was significant, F (1, 13908.24) = 10.22, p = .001, potentially explaining the lack of significant differences in HR based on the main effect of ad type. The interpretation of the slopes of ads featuring same-sex couples indicated a positive relationship between implicit attitudes and HR such that more negative implicit attitudes were associated with increased HR (i.e., decreased attention). For ads featuring other-sex couples, there was a slightly negative relationship between implicit attitudes and HR such that, as implicit attitudes became more negative, HR decreased (i.e., increased attention) to other-sex couples. In other words, more negative implicit attitudes were associated with decreased attention to ads with same-sex couples and a slight increase in attention to ads with other-sex couples. Hypothesis 6 was supported.

FIGURE 2 ABOUT HERE

MLM results from the skin conductance (SC) data responded to the fourth and seventh hypotheses. Hypothesis 4 predicted a main effect of Ad type such that arousal would be greater for ads featuring same-sex couples compared to ads featuring other-sex couples. Hypothesis 7 expected an interaction between Implicit Attitudes and Ad Type on arousal, operationalized as SC level. Specifically, we predicted that (1) more negative implicit attitudes would be associated with increased SC after the same-sex couples reveal and (2) more negative implicit attitudes would be associated with decreased SC after the other-sex couples reveal.

The ICC for the model was .04, which is classified as a very small effect (Cohen 1992) and potentially indicates that observations are independent of each other. Ad type significantly predicted skin conductance response to the advertisements $F(1, 15803.37) = 166.61$, $p < .001$. Overall, participants demonstrated greater skin conductance (more arousal) to ads featuring same-sex couples compared to ads featuring other-sex couples. Hypothesis 4 was supported. Time was significant in the model, $F(1, 14.65) = 115.68$, $p < .001$ indicating a linear growth curve for SC. Implicit attitudes did significantly predict skin conductance response to the advertisements in general, $F(1, 59.69) = 6.58$, $p = .01$, but the interaction of sexual orientation and implicit attitudes was not significant, $F(1, 15800.18) = 1.74$, $p = .19$. Hypothesis 7 was not supported.

To examine possible sensitization or habituation effects of the physiological variables that were significantly associated with implicit attitudes, we examined the impact of presentation order of ads featuring same-sex couples on fEMG and HR. Specifically, we ran a repeated-measures ANOVA on repetition to see if physiological responding changed over repeated presentation of the ads (Greenhouse-Geisser corrections presented due to violation of sphericity in physiological data). Results show no effect of presentation order on fEMG ($F(4, 290.32) = .90$, $p = .47$) or HR ($F(4, 281.38) = .47$, $p = .76$).

Discussion

Consistent with expectations informed by Social Identity Theory (SIT), the findings from Study 1 indicated that participants preferred ads featuring the in-group (other-sex couples) compared to ads featuring the out-group (same-sex couples) in self-reported attitudes toward the ads (H1) and physiological arousal (H4). Unexpectedly, the physiological indicator of negative affect was increased (H2) for ads with other-sex couples compared to ads with same-sex couples.

Also unexpected was the finding that attention (H3) did not differ across the two Ad Type conditions (although trended in the expected direction, $p = .06$). These findings are explained by closer examination of the interactions for negative affective response and attention (H5 and H6), which revealed that ads with same-sex couples decrease negative affective responding and increase attention for those with relatively low negative implicit attitudes toward homosexuality. As implicit attitudes became more negative, negative affect increased and attention decreased to ads featuring same-sex couples. While negative implicit attitudes were associated with more attention to other-sex couples, they were also associated with more negative affect – potentially due to an emotion contagion effect. Specifically, viewing an ad with gay imagery may have increased negative affect to all ads for those who were high in negative implicit attitudes. Implicit attitudes did not interact with arousal (H7). Implicit attitudes were associated with liking and positivity of ads featuring same-sex couples, such that as implicit attitudes became more negative, liking and positivity decreased. Negativity and purchase intention were not affected by implicit attitudes (RQ1).

There were several limitations to Study 1. First, because participants saw ads with both same- and other-sex couples, it is possible that there was a carry-over effect of the ads. Specifically, ads in one condition may have affected responding to ads in the other condition. Second, the sample of students from mass communication courses in this study limits generalizability of these findings to other populations. Finally, it is possible that application of electrodes could affect responses of participants. Electrodes may serve as a bogus pipeline that prompts participants to report attitudes that are congruent with their actual feelings because they do not want incongruence in their response to be revealed through bodily responding (Jones and Sigall 1971). Two more studies were conducted to address these possibilities.

STUDY 2

Study 2 had three aims. First, because of concerns of a carry-over effect and socially desirable responding to the within-subjects design of Study 1, we attempted to replicate these findings in a between-subjects design. We expected that participants assigned to view ads with other-sex couples would report greater preference to the ads than those assigned to view ads with same-sex couples (H1). Second, we included a non-student sample to examine if our findings would generalize to a larger population. Finally, we included questions to examine self-reported differences in attention (H3) and arousal (H4) to the ads to see how they would relate to the differences in physiological indicators of these phenomena found in Study 1.

Method

Stimuli. The same 10 ads from Study 1 were used as stimuli in Study 2. However, in Study 2, participants were randomly assigned to one of two blocks: one containing the 5 ads with same-sex couples and one containing the 5 ads with other-sex couples. Ads were randomized within each block by the stimulus presentation program in a similar manner to Study 1.

Dependent variables. In addition to those in Study 1 (positivity, negativity, liking, and purchase intention) participants were also asked about their excitement (arousal), attention, engagement, concentration, and how much thought they put into evaluation of the ads. Again, responses to the questions were reported on a 1 (*not at all*) to 7 (*very much*) scale.

Filler Scales. Five questions selected from each of two scales unrelated to the study, Attitudes toward Old People (Kogan 1961) and the Facebook Addiction Scale (Andreassen et al., 2012), were administered to disguise the true variables of interest in the study.

Individual Difference Variables. Demographic questions were administered to assess age, race/ethnicity, gender, sexual orientation, occupation, and level of education obtained. To assess

explicit attitudes toward homosexuality, the ATLG-R (revised short version) was administered (Herek 1988, 1994), as described in Study 1.

Participants and design. Study 2 participants were 398 adult non-students that participated via Amazon Mechanical Turk (MTurk), an online survey provider commonly used in advertising research (Baek and Yoon 2017; Minton, 2015; Minton, Lee, Orth, Kim, and Kahle 2012; Muehling, Sprott, and Sultan 2014; Saenger, Jewell, and Grigsby 2017; Zhao, Muehling, and Kareklas 2014). [1]

Geographical location of the participants for Study 2 was limited to the United States. MTurk screening procedures were used to ensure participants were not first time survey takers or masters. A single batch of data collection was used, ensuring that participants could not take part in the study more than once. As suggested by Kees et al. (2017), the description of the survey did not provide the desired sample characteristics or the nature of the task to reduce potential self-cheating and selection bias. The study was advertised as assessing "responses to ads"; it was not revealed beforehand that the study was, more specifically, assessing responses to ads with gay imagery.

A total of 38 participants were excluded from analysis because they reported a sexual orientation other than heterosexual, leaving a final *n* of 360 (184 women). Participants ranged in

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[1] MTurk has been reported as more demographically diverse than college student samples (Buhrmester, Kwang, and Gosling 2011; Minton 2015). A recent *Journal of Advertising* article also empirically tested the quality of experimental advertising data collected from MTurk to data collected from professional panels and student samples in controlled (i.e., lab) and uncontrolled settings. This study found that MTurk data collected during theory-driven advertising experiments were superior to data collected from professional panels and from student samples in uncontrolled settings (Kees, Berry, Burton, and Sheehan (2017). Specifically, Kees and colleagues (2017) found that, compared to the other samples tested, MTurk respondents were more involved in processing ads, reported less multitasking, performed better on attention check questions, and wrote more text in open-ended questions.

age from 19 to 72 ($M = 39$, $SD = 12.05$). Study 2 used a 2 (Ad Type) X 5 (Brand) mixed design. Ad Type was the between subjects factor. Participants were randomly assigned to watch 5 ads with same-sex couples or 5 ads with other-sex couples. Brand was a repetition factor as described in Study 1.

Procedure. Participants viewed either 5 ads with same-sex or 5 ads with other-sex couples, depending on condition. Participants were unable to proceed to the next screen before an ad had finished playing to ensure that they were exposed to the entire message. At the end of the entire protocol, participants received a code required to receive $0.51 compensation for participation. This ensured the entire questionnaire was completed.

A total of 183 participants saw ads with other-sex couples and 177 saw ads with same-sex couples. All ads were randomly presented and after each ad participants filled out questions about attitudes toward the message they had just seen. After all 5 ads were presented, participants provided demographic data. Finally, participants completed the ATLG-R and the two filler scales, which were presented in a randomized order.

Results

Responses to ads were assessed using a series of Independent Samples T-Tests (refer to Table 1 for all means and standard deviations). Hypothesis 1 predicted that participants who saw ads featuring same-sex couples would report less liking, positivity, and purchase intention and more negativity for the ads compared to participants assigned to see ads featuring other-sex couples. Participants liked the ads with other-sex couples more than the ads with same-sex couples ($t (332.57) = 4.53$, $p < .001$), demonstrated increased purchase intentions for the ads with other-sex couples compared to the ads with same-sex couples ($t (358) = 3.86$, $p < .001$), and reported more positivity ($t (343.23) = 4.82$, $p < .001$) to the ads with other-sex couples than the

ads with same-sex couples. The ads featuring other-sex couples also elicited less negative responses than the ads with same-sex couples (t (339.63) = -3.89, $p < .001$). Hypothesis 1 was supported.

Hypothesis 3 predicted that participants who saw ads featuring same-sex couples would report paying less attention to them than those who saw ads featuring other-sex couples. Evaluations of the ads did not differ in terms of self-reported attention (t (358) = .54, $p = .59$), engagement (t (358) = .87, $p = .39$), concentration (t (358) = .50, $p = .62$), or thoughts of evaluation (t (358) = -.30, $p = .76$). Hypothesis 3 was not supported. Hypothesis 4 predicted that participants would demonstrate more arousal to ads featuring same-sex couples to ads featuring other-sex couples. Participants who saw ads with other-sex couples reported them to be more exciting than participants reported the ads with same-sex couples, t (358) = 3.74, $p < .001$. Hypothesis 4 was supported.

We also examined the impact of presentation order of ads featuring same-sex couples on these self-reported variables. Specifically, a repeated-measures ANOVA was conducted to see if self-reported responding changed over presentation of these ads. We found a significant effect of presentation order on liking (F(4, 704) = 6.83, $p < .001$, $\eta^2 = .04$), positivity (F(4, 704) = 5.88, $p < .001$, $\eta^2 = .03$), purchase intention (F(4, 704) = 2.61, $p = .03$, $\eta^2 = .02$), negativity (F(4, 704) = 3.97, $p = .003$, $\eta^2 = .02$), attention (F(4, 704) = 6.12, $p < .001$, $\eta^2 = .03$), and excitement (F(4, 704) = 2.61, $p = .03$, $\eta^2 = .02$). Examination of the means indicates that negativity increased and liking, positivity, purchase intention, excitement, and attention decreased over presentation (see Table 2). However, all of the effect sizes are very small for self-reported data and may suggest an increased negative mood as the online experiment proceeded. The random presentation of ads helped to mitigate this effect in regards to the hypotheses.

Discussion

Study 2 used a between-subjects design to examine responses to ads featuring same- and other-sex couples. Although it is possible that the participants in the same-sex ad condition could suspect the nature of the study, the between-subjects nature of the design made it impossible for those in the other-sex ad condition to do so. Therefore, the comparison of self-report responses is less susceptible to concerns of response bias associated with Study 1.

Consistent with the expectations of Social Identity Theory (SIT) and the findings of Study 1, we found that participants demonstrated increased liking, positivity, and purchase intentions to ads featuring other-sex couples. Additionally, in contrast to Study 1, participants also found ads with other-sex couples less negative than ads with same-sex couples (H1). Finally, participants reported more arousal (H4), but not less attention (H3), to ads featuring same-sex couples. These self-report findings are consistent with results of Study 1 that indicate no difference in physiological attention, but more physiological arousal to ads featuring same-sex couples, compared to other-sex couples. Findings regarding the impact of ad presentation order indicate that repeated presentation of ads with same-sex couples influenced self-reported responding toward these ads over time. These findings highlight the importance of using implicit measures to assess responses to socially sensitive phenomena in advertising and potentially indicate the impact of sensitization on self-reported responses to repeated presentations of ads featuring same-sex couples. A limitation of Study 2 was the use of an MTurk sample, collected over the internet although some research indicates that MTurk data are superior to professional panels and data collected from student samples in uncontrolled (i.e., non-laboratory) settings (Kees et al. 2017).

STUDY 3

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The goal of Study 3 was to examine if findings from Study 1 and Study 2, that participants report less positive responses to ads featuring same-sex couples (H1), could be replicated in a within-subjects experiment conducted in a lab environment with a more generalizable sample than Study 1. Study 3 also examined the extent to which implicit attitudes were associated with self-reported attitudes toward the ad (RQ1). Study 3 differed from Study 1 in that measures were taken from several participants at a time and that the respondents were not hooked up to physiological equipment. The latter allowed us to examine the possible impact of a bogus pipeline effect in Study 1. A bogus pipeline is a social psychological technique used to reduce false responding. When participants are hooked up to electrodes they may provide more accurate self-report because of the perception that a machine will reveal bodily responses incongruent with self-reported attitudes (Jones and Sigall 1971).

Method

Stimuli. The same 10 ads were used as stimuli in Study 3. As in Study 1, participants watched all 10 ads in a randomized order determined for each participant by the MediaLab stimulus presentation software (Jarvis, 2016).

Dependent variables. Study 3 examined the same reported responses to the ads (positivity, negativity, liking, purchase intention) as Study 1. Responses to the questions were reported on a 1 (*not at all*) to 7 (*very much*) scale.

Filler Scales. The same Filler Scales used in Study 2 were used in Study 3.

Individual Difference Variables. Demographic questions were administered to assess age, race/ethnicity, gender, sexual orientation, and occupation. To assess explicit attitudes toward homosexuality, the ATLG-R (revised short version) was administered (Herek 1988, 1994). The

Sexuality IAT was administered to examine implicit attitudes toward homosexuality. Detailed descriptions of both measures are provided in Study 1.

Participants and design. Adult participants ($n = 43$) were recruited through ads placed in the classifieds section of the university website and through flyers posted in businesses around town. The ads and flyers announced a study examining responses to advertisements. Participants were compensated with a $10 Amazon gift card for 30 minutes of participation. A total of 7 participants identified their sexual orientation as other than straight and were not included in the analyses. Thus, 36 participants (27 women) remained who ranged in age from 18 to 56 ($M = 24$, $SD = 7.79$). Two participants declined to take the IAT and 1 participant's IAT data were overwritten due to an experimenter error, leaving a total of 33 participants in the IAT analyses. As described in Study 1, Study 3 employed a 2 (Ad Type) X 5 (Brand) within-subjects design.

Procedure. Once in the lab, participants read and signed an informed consent form and were seated in a room with multiple stimulus presentation computers separated by a privacy partition. Participants watched all 10 ads in a randomized order and answered questions about attitudes toward the ad after each ad. At the end of the study, participants completed demographics and then were presented with the ATLG-R, Sexuality IAT, and the two filler questionnaires in a random order. After completion, participants were debriefed and asked if they guessed the nature of the study during participation. Most participants (84%) guessed that the study was about sexual orientation.

Results

A series of 2 (Ad Type) X 5 (Brand) repeated measures ANOVAs were conducted to examine self-reported responses to the ads (see Table 1). Against expectations, there was not a main effect of Ad Type on liking ($F (1, 35) = .60$, $p = .45$, $\eta^2 = .017$), positivity ($F (1, 35) = 1.58$,

$p = .22$, $\eta^2 = .043$), or purchase intention ($F (1, 35) = .32$, $p = .58$, $\eta^2 = .009$). However,

participants thought that the ads with other-sex couples were more negative than the ads with

same-sex couples ($F (1, 35) = 4.57$, $p = .04$, $\eta^2 = .116$). This is in contrast to H1, which expected

that participants would respond more negatively to the ads featuring same-sex couples than the

ads with other-sex couples.

A series of linear regression analyses were used to examine if implicit attitudes were

significantly associated with self-reported responses to ads with same-sex couples. Implicit

attitudes were not associated with liking ($b = -1.85$, $t (32) = -1.15$, $p = .26$), or negativity ($b =

.61$, $t (32) = .55$, $p = .59$), but were marginally associated with positivity ($b = -2.34$, $t (32) = -

1.74$, $p = .09$). For positivity, 8.6% of the variance to the ads featuring same-sex couples was

explained by implicit attitudes ($R^2 = .09$, $F (1, 32) = 3.01$, $p = .09$). Implicit attitudes were

significantly associated with purchase intentions ($b = -4.03$, $t (32) = -2.71$, $p = .01$) and explained

18.7% of the variance for purchase intentions to the ads featuring same-sex couples ($R^2 = .19$, $F

(1, 32) = 7.35$, $p = .01$).

We examined potential effects of order of ad presentation on self-reported attitudes by

organizing our file by repetition (e.g., first ad presented, second ad presented) and conducting a

repeated measures ANOVA on the ads featuring same-sex couples. We found no effect of

presentation order on liking ($F (4, 140) = 1.60$, $p = .18$), purchase intention ($F (4, 140) = 1.28$, $p

= .28$), positivity ($F (4, 140) = .81$, $p = .52$), or negativity ($F (4, 140) < 1.00$).

Discussion

Unlike in Study 1 and Study 2, participants in Study 3 did not differ, for the most part, in

their evaluations of ads featuring same- and other-sex couples. In contrast to expectations of

Social Identity Theory, these participants found ads with same-sex couples less negative than ads

with other-sex couples, but did not differ on any of the other self-report variables (H1). This suggests that differences in results from Study 1 to Study 3, which were both within-subjects designs, were due to a bogus pipeline created by having participants wear electrodes in Study 1. Specifically, participants in Study 1 may have responded more accurately due to fear of exposing incongruence in attitudes revealed through physiological responding (Jones and Sigall 1971). In Study 3, participants were not hooked up to electrodes, which means there was no bogus pipeline to discourage false responding. Additionally, results in Study 3 may have differed from those of Study 2, because in Study 2 participants saw either ads with same- or other-sex couples, not both, and may not have picked up on the nature of the study to such an extent that they responded in socially desirable ways. Finally, the responses of the sample in Study 3 may have been affected by the presence of other participants in the room during the experiment. Alternatively, these differences could be due to sample constitution as the sample in Study 3 represents a portion of the population (e.g., women) that holds less negative attitudes toward homosexuality in general (Oakenfull and Greenlee 2004) which may have biased the self-report results. When comparing the scores on explicit attitudes toward homosexuality this seems to be the case: Participants in study 2 ($M = 2.25$ $SD = 1.19$) held more negative explicit attitudes than participants in study 3 ($M = 1.50$ $SD = .71$); however, the ATLG-R data were not normally distributed for study 3, so these results should be interpreted with caution.

Despite few overall differences in self-reported preference for ads with same-sex couples found in Study 3, negative implicit attitudes toward homosexuality were still found to be associated with negative self-reported responses to ads with same-sex couples: decreased purchase intentions and positivity (marginally, $p = .09$), but not negativity or liking (RQ1). These findings indicate that even when main effects are obscured by potential methodological

and/or sample constitution concerns, implicit attitudes are still somewhat associated with responses to ads with gay imagery. These findings also hint at the idea that reporting negative feelings (more so than less positive feelings) toward ads featuring homosexuality is particular vulnerable to social desirability effects, something that we also observed in Study 1.

DISCUSSION

This research extends Social Identity Theory (SIT; Tajfel and Turner 1986) by examining self-reported responses and the dynamic cognitive and affective processing of advertisements featuring same-sex couples, testing whether implicit attitudes toward homosexuality are associated with these outcomes. In line with previous research that indicates heterosexual consumers tend to favor advertisements featuring the in-group (Angelini and Bradley 2010; Bhat, Leigh, and Wardlow 1998; Hooten, Noeva, and Hammonds 2009), this study demonstrates some support for SIT in the context of sexual orientation in advertising during an era in American consumer culture of increasing public acceptance for this group. Specifically, in Studies 1 and 2 preferences for in-group protagonists were seen in responses to the ads. However, in Study 3, participants found ads with same-sex couples less negative than ads with other-sex couples, potentially due to the lack of a bogus pipeline to increase accurate responses when social desirability was a concern, coupled with the fact that most of the participants in Study 3 were students and/or women – who hold more progressive views toward homosexuality (Oakenful and Greenlee 2004). Taken together, the findings from these three studies indicate that responses to gay imagery are not simply explained by in-group favoritism. Instead, other psychological variables, like implicit attitudes, provide more nuanced insight into consumer response.

Explicit attitudes toward homosexuality affect responses to ads featuring gay imagery (Hester and Gibson 2007; Um 2014) but some research indicates that implicit attitudes reveal effects on consumer behavior that explicit measures do not (Brunel, Tietje, and Greenwald 2004). However, previous research has not investigated the relationship between implicit attitudes toward homosexuality and attitudes toward ads featuring gay imagery. Our results add to this literature, demonstrating that implicit attitudes toward homosexuality were negatively associated with liking, positivity (Study 1), and purchase intentions (Study 3) toward ads featuring same-sex couples. Furthermore, even though the main effect of Ad Type on responding was not as expected in Study 3 (potentially due to methodological and/or sample concerns) we found that implicit attitudes were still associated with responding to ads with gay imagery. Consistent with previous findings, explicit attitudes toward the ad became more positive as attitudes were less anti-gay (Hester and Gibson 2007). However, in contrast to other research, which reports that explicit attitudes were associated with negatively-worded responses to gay imagery in advertisements (Bhat, Leigh, and Wardlow 1998), the present study found that implicit attitudes were not associated with negatively-worded responses. It is possible that differences in self-report based on implicit attitudes only manifests when questions address positive (but not negative) response to the advertisements. This supposition is consistent with research that indicates that positive and negative attitudes do not form a single dimension and can coexist (Schimmack 2005). Furthermore, in the context of consumer attitudes, some research indicates that negatively worded scale items are less likely than positively worded items to accurately reflect the measured concept of interest (Alexandrov 2010).

This research also provides psychophysiological results that demonstrate preference for ads featuring the in-group compared to ads featuring the out-group, while also indicating that

psychophysiological and self-report variables are better considered in conjunction with implicit attitudes, especially in certain contexts (e.g., when there are sample constitution/methodological concerns as in Study 3). Specifically, implicit attitudes were associated with attention and negative affective responding to ads with same- and other-sex couples. Less negative implicit attitudes toward homosexuality, compared to high negative implicit attitudes, were associated with more attention to ads featuring same-sex couples and less negative affect to ads featuring both same- and other-sex couples. This finding extends past work (Hester and Gibson 2007) by providing initial physiological support for self-report data indicating that some heterosexual consumers actually favor advertisements that are inclusive of LGB imagery and people (Hester and Gibson 2007).

In contrast, high negative implicit attitudes toward homosexuality were associated with increased negative affect and less attention to ads featuring same-sex couples. Based on these findings, consumers with less egalitarian implicit attitudes may disengage from ads they find undesirable because of their negative emotional reactions to the ads. These findings provide tentative physiological (Study 1) and behavioral (Study 2) support for the idea that emotional reactions are established before further cognitive processing of the ad takes place (Poels and Dewitte 2006; Morris et al. 2002). Specifically, those with high negative attitudes first experience negative affect in response to ads featuring same-sex couples and then decreased (either consciously or unconsciously) attention to subsequent ads while those with low negative implicit attitudes first experience less negative (or even positive) affect to ads with same-sex couples and then increased attention to subsequent ads. Future research should investigate this possibility with measures better able to look at the rapid time course of perception of sexual

orientation of actors in ads—event related potential (ERP) analysis of electroencephalographic (EEG) data would likely be an ideal tool in this regard.

Implicit attitudes toward homosexuality interacted with Ad Type when it came to the amount of attention paid and negative affect response to the messages, but not to physiological arousal. Although the arousal results were unexpected, this is consistent with research that indicates that perceived violations of sociomoral principles affect resource allocation as measured with heart rate, but not autonomic arousal measured via skin conductance (Rubenking and Lang 2014). Some research indicates that arousal has less influence on attitudes toward the ad than affect (Olney, Holbrook, and Batra 1991; Pieters and de Klerk-Warmerdam 1996). It is also important to note that arousal was the only physiological variable in which a main effect of preference for the in-group was detected.

Managerial Implications

In recent years, mainstream media in the United States has seen a rise in the release of ads featuring gay imagery (Atkinson 2003; Elliott 2013; Muller 2015). In 2015, *Ad Age* proclaimed that the inclusion of gay imagery in advertisements was at "an all-time high and will likely increase" (Muller 2015). LGB-inclusivity in ads in mainstream outlets can be considered a pro-social move, but it is also strategic for marketers; buying power of LGB consumers is almost $1 trillion a year (Green 2016). Additionally, survey market research suggests that many young people, regardless of sexual orientation, report preference for LGBT-friendly brands over competitors (Snyder 2015). Thus, placing ads that feature gay imagery in mainstream media has the potential to appeal not only to LGB consumers, but also to certain heterosexual consumers. The present series of studies examined how heterosexual consumers respond to ads featuring gay imagery in an era of increasing social consciousness (e.g., after the legalization of gay marriage

in 2015) and how consumers' implicit attitudes toward homosexuality are associated with this response.

Results indicate that heterosexual consumer response to ads with gay out-groups is not ubiquitously negative and, in fact, is sometimes even more positive to these ads than to ads that feature a heterosexual in-group. Some heterosexual consumers may like seeing sexual minorities represented in ads and these consumers respond positively to them. In terms of practical implications, placing television ads featuring same-sex couples in mainstream media outlets may be a successful strategy with heterosexual consumers who hold egalitarian views toward homosexuality. Furthermore, these consumers also respond more favorably to ads in close temporal proximity to ads with gay imagery. Specifically, for some consumers, seeing ads with gay imagery may increase their receptiveness to surrounding ads that do not feature such imagery. These studies provide empirical evidence in support of the aforementioned survey market research that indicates that consumers prefer companies' LGB-friendly strategies (Snyder 2015). Additionally, these studies implicate a specific psychological variable (implicit attitudes) as important to consider when deciding which heterosexual consumers will respond positively to ads with gay imagery.

Because some consumers do not respond positively to ads with gay imagery, advertisers who desire to place ads with gay imagery in mainstream media vehicles should be familiar with the psychographic make-up of the target audiences for these vehicles. This study finds that these ads will be most effective with those who hold implicit egalitarian attitudes toward homosexuality. The relatively youthful and educated demographic composition of participants in Studies 1 and 3 indicate that educated millennials who hold egalitarian attitudes, in particular, may respond favorably to these ads. Additionally, recent research finds that consumers

increasingly value LGBT-inclusive ad campaigns if they are authentic (Ogilvy 2017; Snyder 2015). In other words, if a brand promotes inclusivity in advertising in order to further societal acceptance of social out-groups, a growing number of consumers would be willing to support that brand in favor of brands who are not inclusive or authentic in their inclusivity strategies.

Study Limitations and Future Directions

The use of multiple physiological measures to investigate cognitive and affective processing is one strength of this research. While self-reported measures of attention, arousal, and affect require participants to think about and report these processes, physiological measures allow for investigation of these dynamic psychological processes as they occur in real time. Furthermore, this phasic activity is preserved through the analytical technique of multilevel modeling. Still, it is necessary to mention that the nature of physiological data recording introduces artificialities—electrodes on the skin, solitary message viewing, etc.—that are associated limitations of these dependent variables.

Another limitation is that, because pre-existing advertisements were used as stimuli, we did not have total control over the content of the advertisements. Although we assessed each of the advertisements to reduce any systematic differences other than the experimental manipulation of couple type, it is possible that there were differences that we were unable account for. Essentially, we reduced experimental control to increase ecological validity. However, we believe that the ecological validity of using pre-existing ads make our findings more valuable for advertisers. Second, some may view message repetition as problematic in a study in which deception is optimal – as participants may guess the nature of the study. However, psychophysiological measures are well suited to assess response in this sort of experimental design. As mentioned above, psychophysiological measures are less susceptible to

socially desirable responding as participants (1) most likely do not know what the sensors measure and (2) cannot control automatic physiological responding to stimuli. Thus, psychophysiological responses are likely unaffected even if participants guess the true nature of the experiment and desire to conceal differences in attention, affect, or arousal to the advertisements. Furthermore, our analyses did not indicate an effect of message order on physiological responding. Interestingly, even though it is likely that participants guessed the intentions of the study, they still demonstrated differences that favored the in-group in Studies 1 and 2. These responses also mostly varied as predicted with implicit attitudes in the studies in which we assessed these attitudes (Studies 1 and 3).

Another limitation is that the IAT measure was administered after participants viewed the advertisements in order to conceal the true nature of the study (although participants may have picked up on study aims during exposure to the stimuli). However, we believe that the benefits of administering the IAT after the experimental manipulation outweighed the issue of administering it before. Responses to the IAT show adequate reliability and validity (Cunningham, Preacher, and Banaji 2001). Furthermore, all participants were exposed to the same experimental stimuli in the within-subject designs of Study 1 and Study 3 (the two studies in which the IAT was administered), thus any possible influence on IAT scores are not due to exposure to different stimuli. Moreover, although it is possible that participants were aware of what we were investigating when the IAT was administered it is unlikely that they were aware that they had implicit bias (and therefore tried to control it on the IAT) or that millisecond differences in responding can predict bias (Zárate 2009).

Finally, the logical generalizability of these experimental results to larger populations of audiences and to product categories should be done with caution. Although a recent analysis

(Kees et al. 2017) suggests data collected by MTurk has substantial benefits over data collected by other methodology, including a randomly recruited commercial respondent panel, the respondents to our second study were not randomly selected from a population frame. Further, our sample from Study 3 is also one of convenience. Although we tried to recruit a more generalizable sample for Study 3, we ended up with mostly students, likely due to the fact that recruitment fliers were posted in a college town. Therefore, the ability to statistically generalize our findings to adult consumers is impossible. We recommend future research attempt to provide such randomly selected respondents or, at the very least, provide replications to our findings here in order to more confidently make logical generalizations. Furthermore, the very nature of the topic matter—same-sex couples and their acceptance in society—is likely highly influenced by the age demographic of the target audience. Although the statistically significant results from our study suggest a non-random relationship between the sexual orientation of couples used in ads, reported attitudes toward the ad, implicit attitudes toward homosexuality, and psychophysiological variables—it is a relationship that for now can likely only be limitedly applied to other populations such as older consumers and ones with different education and SES. Future research should investigate if these findings apply to older, less educated samples.

Future research should also compare the responses of participants who identify as gay and straight. Through the lens of SIT we would expect gay participants to respond more negatively to ads featuring other-sex couples. However, as implicit attitudes stem from knowledge of culturally held stereotypes that are pervasive and well-known within a society, it is not clear how the responses of gay participants will be associated with implicit attitudes toward homosexuality. Additionally, in this study we examined responses to ads in which sexual orientation of the featured couple was revealed during the course of the ads. Future research

could investigate responding to ads that present sexual orientation in a different manner. For example, rather than sexual orientation being "revealed", responses to ads in which the sexual orientation of a couple is apparent throughout the ad should be investigated. This would allow for comparison of a short term implicit and explicit response in the current study to responses over the course of an advertisement containing gay imagery. Finally, although this study was interested in the individual difference of implicit attitudes, it is possible that other individual difference variables are also associated with responding to ads with same-sex couples. For example, it would be interesting and informative to compare responses to these ads by participant gender as some research indicates that women are more receptive to ads with gay imagery than are men (Oakenfull & Greenlee, 2004).

Conclusions

Heterosexual participants, overall, demonstrated preferences for ads featuring the in-group (Studies 1 and 2). However, individual differences in implicit attitudes toward homosexuality were associated with within-group variability in responding (Studies 1 and 3). While those with negative implicit attitudes demonstrated less positive responses, more negative affect, and less attention to ads featuring same-sex couples, the reverse is true for those with positive implicit attitudes. In terms of implications for advertisers, our findings indicate that, although ads with other-sex couples were preferred, the inclusion of same-sex couples in advertisements does not necessarily alienate all heterosexual consumers. These ads may be well received by heterosexual consumers with positive implicit attitudes toward homosexuality. Additionally, some research finds that consumers increasingly value LGB-inclusive ad campaigns (Ogilvy 2017; Snyder 2015). Based on research that finds that attitudes toward sexual minorities are affected by mediated representation and contact (Bonds-Raacke et al. 2007; Calzo

and Ward 2009; Gross 1991; Mazur and Emmers-Sommers 2002; Riggle, Ellis, and Crawford 1996; Schiappa, Gregg, and Hewes 2006) we believe that inclusivity in advertising is an important step for the promotion of societal acceptance of social out-groups.

REFERENCES

Alexandrov, Aliosha (2010), "Characteristics of Single Item Measures in Likert Scale Format," *The Electronic Journal of Business Research Methods,* 8 (1), 1-12.

Andreassen, Cecilie Schou, Torbjørn Torsheim, Gier Scott Brunborg, and Ståle Pallesen (2012), "Development of a Facebook Addiction Scale," *Psychological Reports,* 110 (2), 501-517.

Angelini, James R., and Samuel D. Bradley (2010), "Homosexual Imagery in Print Advertisements: Attended, Remembered, but Disliked," *Journal of Homosexuality,* 57 (4)*,* 485-502.

Atkinson, Claire (2003), "Marketers Warm up to Gay Audience," Advertising Age, available at http://adage.com/article/news/marketers-warm-gay-audience/95910/ (accessed June 23, 2017).

Baek, Tae Hyun and Sukki Yoon (2017), "Guilt and Shame: Environmental Message Framing Effects," *Journal of Advertising,* 46 (3), 440-453.

Berkman, Elliot T. and Emily B. Falk (2013), "Beyond Brain Mapping: Using Neural Measures to Predict Real-world Outcomes," *Current Directions in Psychological Science,* 22 (1)*,* 45-50.

Bhat, Subodh, Thomas W. Leigh, and Daniel L. Wardlow (1998), "The Effect of Consumer Prejudices on Ad Processing: Heterosexual Consumers' Responses to Homosexual Imagery in Ads," *Journal of Advertising,* 27 (4)*,* 9-25.

Blascovich, Jim, Eric Vanman, Wendy B. Mendes, and Sally Dickerson (2011), *Social Psychophysiology for Social and Personality Psychology,* London, England: Sage Publications.

Bonds-Raacke, Jennifer, M., Elizabeth T. Cady, Rebecca Schlegel, Richard Jackson Harris, and Lindsey Firebaugh (2007), "Remembering Gay/Lesbian Media Characters: Can Ellen and Will Improve Attitudes Toward Homosexuals?" *Journal of Homosexuality,* 53 (3), 19-34.

Boucher, Jerry D., and Paul Ekman (1975), "Facial Areas and Emotional Information," *Journal of Communication,* 25 (2), 21-29.

Brunel, Frederic F., Brian C. Tietje, and Anthony G. Greenwald (2004), "Is the Implicit Association Test a Valid and Valuable Measure of Implicit Consumer Social Cognition?," *Journal of Consumer Psychology,* 14 (4), 385-404.

Buhrmester, Michael, Tracy Kwang, and Samuel D. Gosling (2011), "Amazon's Mechanical Turk: A New Source of Inexpensive, Yet High-Quality, Data?" *Perspectives on Psychological Science,* 6 (1), 3-5.

Calzo, Jerel P. and L. Monique Ward (2009), "Media Exposure and Viewers' Attitudes Toward Homosexuality: Evidence for Mainstreaming or Resonance?" *Journal of Broadcasting & Electronic Media,* 53 (2), 280-299.

Cohen, Jacob (1992), "A Power Primer," *Psychological Bulletin,* 112 (1)*,* 155-159.

Cunningham, William A., Kristopher J. Preacher, and Mahzarin R. Banaji (2001), "Implicit Attitude Measures: Consistency, Stability, and Convergent Validity," *Psychological Science,* 12 (2)*,* 163-170.

Dasgupta, Nilanjana (2009), "Mechanisms Underlying the Malleability of Implicit Prejudice and Stereotypes: The Role of Automaticity and Cognitive Control," in *Handbook of Stereotyping, Prejudice, and Discrimination*, Todd D. Nelson, ed., New York, NY: Psychology Press, 267-284.

Devine, Patricia G. (1989), "Stereotypes and Prejudice: Their Automatic and Controlled

      Components," *Journal of Personality and Social Psychology,* 56*,* 5-18.

Dotsch, Ron, and Daniel H.J. Wigboldus (2008), "Virtual Prejudice," *Journal of Experimental*

      Social Psychology, 44 (4)*,* 1194-1198.

Dovidio, John F., Miles Hewstone, Peter Glick, and Victoria M. Esses (2010), "Prejudice,

      Stereotyping and Discrimination: Theoretical and Empirical Overview," in *The SAGE*

      Handbook of Prejudice Stereotyping and Discrimination, John F. Dovidio, Miles

      Hewstone, Peter Glick, and Victoria M. Esses, eds., Thousand Oaks, CA: SAGE

      Publications INC, 3-28.

Dunton, Bridget C., and Russell H. Fazio (1997), "An Individual Difference Measure to Control

      Prejudiced Reactions," *Personality and Social Psychology Bulletin,* 23 (3)*,* 316-326.

Elliott, Stuart (2013), "Commercials with a Gay Emphasis are Moving to Mainstream Media,"

      New York Times*,* available at

      http://www.nytimes.com/2013/06/26/business/media/commercials-with-a-gay-emphasis-

      are-moving-to-mainstream-media.html (accessed June 23, 2017).

Fazio, Russell H., and Michael A. Olson (2003), "Implicit Measures in Social Cognition

      Research: Their Meaning and Use," *Annual Review of Psychology*, 54 (1), 297-327.

Field, Andy (2009), *Discovering Statistics Using SPSS* (3rd Ed.), Thousand Oaks, CA: SAGE

      Publications Inc.

Fridlund, Alan J., and John T. Cacioppo (1986), "Guidelines for Human Electromyographic

      Research," *Psychophysiology,* 23 (5), 567-589.

Green, Jeff (2016), "LGBT Purchasing Power near $1 Trillion Rivals other Minorities,"

      Bloomberg, available at http://www.bloomberg.com/news/articles/2016-07-20/lgbt-

      purchasing-power-near-1-trillion-rivals-other-minorities (accessed June 23, 2017).

Greenwald, Anthony G., Debbie E. McGhee, and Jordan LK Schwartz (1998), "Measuring

      Individual Differences in Implicit Cognition: The Implicit Association Test," *Journal of*

      Personality and Social Psychology, 74 (6), 1464-1480.

------, Brian A. Nosek, and Mahzarin R. Banaji (2003), "Understanding and Using the Implicit

      Association Test: An Improved Scoring Algorithm," *Journal of Personality and Social*

      Psychology, 85 (2), 197-216.

Gross, Larry (1991), "Out of the Mainstream: Sexual Minorities and the Mass Media," *Journal*

      of Homosexuality, 21 (1-2), 19-46.

Guglielmi, Sergio R. (1999), "Psychophysiological Assessment of Prejudice: Past Research,

      Current Status, and Future Directions," *Personality and Social Psychology Review*, 3 (2),

      123-157.

Hazlett, Richard L., and Sasha Y. Hazlett (1999), "Emotional Response to Television

      Commercials: Facial EMG vs. Self Report," *Journal Of Advertising Research*, 39 (2), 7-

      23.

Herek, Gregory M. (1988). Heterosexuals' Attitudes Toward Lesbians and Gay Men: Correlates

      and Gender Differences. *Journal of Sex Research,* 25 (4), 451-477.

------ (1994), "Assessing Heterosexuals' Attitudes toward Lesbians and Gay Men: A Review of

      Empirical Research with the ATLG Scale," in *Lesbian and Gay Psychology: Theory,*

      Research, and Clinical Applications, Beverly Greene and Gregory M. Herek, eds,

      Thousand Oaks, CA: Sage, 206–228.

Hess, U. (2009), "Facial EMG," in *Methods in Social Neuroscience*, Eddie Harmon-Jones and
    Jennifer S. Beer, eds, New York, NY: Guilford Press, 70-91.

Hester, Joe B. and Rhonda Gibson (2007), "Consumer Responses to Gay-Themed Imagery in
    Advertising," *Advertising & Society Review*, 8 (2).

Hooten, Mary Ann, Kristina Noeva, and Frank Hammonds (2009), "The Effects of Homosexual
    Imagery in Advertisements on Brand Perception and Purchase Intention," *Social
    Behavior and Personality,* 37 (9), 1231-1238.

Jarvis, B. G. (2016). MediaLab (Version 2016) [Computer Software]. New York, NY:
    Empirisoft Corporation.

Jones, Edward E. and Harold Sigall (1971), "The Bogus Pipeline: A New Paradigm for
    Measuring Affect and Attitude," *Psychological Bulletin,* 76 (5), 349-364.

Kees, Jeremy, Christopher Berry, Scot Burton, and Kim Sheehan (2017), "An Analysis of Data
    Quality: Professional Panels, Student Subject Pools, and Amazon's Mechanical Turk,"
    Journal of Advertising, 46 (1), 141-155.

Keltner, Dacher and Paul Ekman (2000), "Facial Expression of Emotion" in *Handbook of
    emotions, 2nd edition,* Michael Lewis and Jeanette Haviland-Jones, eds., New York, NY:
    Guilford Publications, Inc, 236-249.

Klara, Robert (2013), "Gay Advertising's Long March Out of the Closet," AdWeek, available at
    http://www.adweek.com/brand-marketing/gay-advertising-s-long-march-out-closet-
    150235/ (accessed June 23, 2017).

Kogen, Nathan (1961), "Attitudes Toward Old People: The Development of a Scale and an
    Examination of Correlates," *Journal of Abnormal and Social Psychology,* 62 (1), 44-54.

LaBarbera, Priscilla A., and Joel D.Tucciarone (1995), "GSR Reconsidered: A Behavior-Based Approach to Evaluating and Improving the Sales Potency of Advertising," *Journal of Advertising Research,* 35 (5), 33-53.

Lang, Annie (1994), "What Can the Heart Tell us About Thinking?" in *Measuring psychological responses to media*, Annie Lang, ed., Hillside, NJ: Lawrence Erlbaum Associates, 99-112.

Minton, Elizabeth A. (2015), "In Advertising We Trust: Religiosity's Influence on Marketplace and Relational Trust," *Journal of Advertising,* 44 (4), 403-414.

------, Christopher Lee, Ulrich Orth, Chung-Hyun Kim, & Lynn Kahle (2012), "Sustainable Marketing and Social Media: A Cross-Country Analysis of Motives for Sustainable Behaviors," *Journal of Advertising,* 41 (4), 69-84.

Mazur, Michelle A. and Tara M. Emmers-Sommer (2002), "The Effect of Movie Portrayals on Audience Attitudes About Nontraditional Families and Sexual Orientation," *Journal of Homosexuality,* 44 (1), 157-179.

Morris, John D., Chongmoo Woo, James A. Geason, and Jooyoung Kim (2002), "The Power of Affect: Predicting Intention," *Journal of Advertising Research,* 42 (3), 7-17.

Muehling, Darrel D., David E. Sprott, & Abdullah J. Sultan (2014), "Exploring the Boundaries of Nostalgic Advertising Effects: A Consideration of Childhood Brands Exposure and Attachment on Consumers' Responses to Nostalgia-Themed Advertisements," *Journal of Advertising,* 43 (1), 73-85.

Nosek, Brian A., Frederick L. Smyth, Jeffrey J. Hansen, Thierry Devos, Nicole M. Lindner, Kate A. Ranganath, Tucker Smith, Kristina R. Olson, Dolly Chugh, Anthony G. Greenwald,

and Mahzarin R. Banaji (2007), "Pervasiveness and Correlates of Implicit Attitudes and Stereotypes," *European Review of Social Psychology,* 18, 36-88.

Oakenfull, Gillian and Timothy Greenlee (2004), "The three rules of crossing over from gay media to mainstream media advertising: Lesbians, lesbians, lesbians," *Journal of Business Research,* 57, 1276-1285.

Ogilvy (2017), "LGBT-Inclusive Advertising Is Driving Business According to Ogilvy Survey," Ogilvy & Mather, available at http://www.ogilvy.com/media-center2017/press-releases/june-28-2017-lgbt-inclusive-advertising-is-driving-business-according-to-ogilvy-survey/ (accessed September 12, 2017).

Olney, Thomas J., Morris B. Holbrook, and Rajeev Batra (1991), "Consumer Responses to Advertising: The Effects of Ad Content, Emotions, and Attitude Toward the Ad on Viewing Time," *Journal Of Consumer Research,* 17 (4), 440-453.

Page-Gould, Elizabeth (2017), "Multilevel modeling," in *Handbook of Psychophysiology,* John T. Cacioppo, Louis G. Tassinary, and Gary G. Berntson, eds., Cambridge, UK: Cambridge University Press, 662-678.

Pieters, Rik G. M., and Marianne de Klerk-Warmerdam (1996), "Ad-Evoked Feelings: Structure and Impact on Aad and Recall," *Journal Of Business Research,* 37 (2), 105-114.

Plant, E. Ashby, and Patricia G. Devine (1998), "Internal and External Motivation to Respond without Prejudice," *Journal of Personality and Social Psychology*, 75 (3), 811-832. D

Poels, Karolien, and Siegfried Dewitte (2006), "How to Capture the Heart? Reviewing 20 Years of Emotion Measurement in Advertising," *Journal Of Advertising Research,* 46 (1), 18-37.

Pozharliev, Rumen, Willem J.M.I. Verbeke, and Richard P. Bagozzi (2017), "Social Consumer
      Neuroscience: Neurophysiological Measures of Advertising Effectiveness in a Social
      Context," *Journal of Advertising, 46* (3), 351-362.

Potter, Robert F. and Paul D. Bolls (2012), *Psychophysiological Measurement and Meaning:*
      Cognitive and Emotional Processing of Media, New York, NY: Routledge.

Riggle, Ellen D. B., Allen L. Ellis, and Anne M. Crawford (2010), "The Impact of "Media
      Contact" on Attitudes toward Gay Men," *Journal of Homosexuality,* 31 (3), 55-69.

Rubenking, Bridget, and Annie Lang (2014), "Captivated and Grossed Out: An Examination of
      Processing Core and Sociomoral Disgusts in Entertainment Media," *Journal of*
      Communication, 64 (3), 543-565.

Saenger, Christina, Robert D. Jewell, Jamie L. Grigsby (2017), "The Strategic Use of Contextual
      and Competitive Interference to Influence Brand-Attribute Associations," *Journal of*
      Advertising, 46 (3), 424-439.

Schiappa, Edward, Peter B. Gregg, and Dean E. Hewes (2008), "Can One TV Show Make a
      Difference? *Will and Grace* and the Parasocial Contact Hypothesis," *Journal of*
      Homosexuality, 51 (4), 15-37.

Schimmack, Ulrich (2005), "Response Latencies of Pleasure and Displeasure Ratings: Further
      Evidence for Mixed Feelings" *Cognition & Emotion,* 21 (5), 671-691.

Snyder, Brendan (2015), "LGBT Advertising: How Brands are Taking a Stance on Issues,"
      available at https://www.thinkwithgoogle.com/articles/lgbt-advertising-brands-taking-
      stance-on-issues.html (accessed June 23, 2017).

Tajfel, Henri, and John C. Turner (1986), "The Social Identity Theory of Intergroup Behavior,"
in *Psychology of Intergroup Relations,* Stephen Worchel and William G. Austin, eds.,
Chicago, IL: Nelson Hall, 7-24.

Tuten, Tracy L. (2006), "Exploring the Importance of Gay-Friendliness and its Socialization
Influences," *Journal of Marketing Communications,* 12 (2), 79-94.

Um, Nam-Hyun (2014), "Does Gay-Themed Advertising Haunt your Brand? The Impact of Gay-
Themed Advertising on Young Heterosexual Consumers," *International Journal of
Advertising,* 33 (4), 811-832.

Weber, René, Klaus Mathiak, and John Sherry (2008) "The Neurophysiological Perspective in
Mass Communication Research," *Biological dimensions of communication: Perspectives,
methods, and research*, 41-71.

Zárate, Michael A. (2009), "Racism in the 21st Century," in *Handbook of Stereotyping,
Prejudice, and Discrimination,* Todd D. Nelson, ed., New York, NY: Psychology Press,
267-284.

Zhao, Guangzhi, Darrel D. Muehling, & Ioannis Kareklas (2014) "Remembering The Good Old
Days: The Moderating Role of Consumer Affective State on the Effectiveness of
Nostalgic Advertising," *Journal of Advertising*, 43 (3), 244-255.

APPENDIX 1

Preprocessing of Physiological Dependent Variables in Study 1

Psychophysiological data were recorded using Biopac model MP150 during the entirety of each ad. The raw data were subject to a low-pass filter of 1000 Hz applied within the amplifier. The data were sampled by a computer at 1000Hz with AcqKnowledge (Biopac Systems Inc., Santa Barbara, CA) recording software and averaged over half-second intervals.

Facial Electromyography (fEMG)

Reusable 4 mm Ag/AgCl electrodes were used to collect bipolar fEMG measurement from the corrugator muscle region. Electrode cups were filled with a conductive electrolyte gel and placed following Fridlund and Cacioppo's (1986) guidelines. The site was cleaned and abraded before the electrodes were attached. Researchers were able to lower inter-electrode impedances to an acceptable level (less than 100 kΩ) for all participants. The raw fEMG signal was filtered to reduce noise within the amplifier. The raw signal was sent to recording software where it was rectified, integrated, smoothed, and converted from volts (V) to microvolts.

Heart Rate (HR)

HR was collected with pre-gelled disposable Ag/AgCl electrodes. Two electrodes were placed on each inner forearm and the third was used as a ground electrode on the non-dominant wrist. Prior to electrode application, an alcohol pad was used to clean and slightly abrade the skin. During collection, the milliseconds between QRS complex in the data were counted and converted to HR (beats per minute – BPM) within the recording software. HR data were examined for double beats, split heartbeats and other data patterns that deviated from a predefined range of normal HR. Missing data were replaced with average HR for that interval. After calculation of the change score any abnormal patterns of change missed during initial

inspection of the data (i.e., positive or negative change of more than 20 BPM from baseline) were inputted as missing values.

Skin Conductance (SC)

Skin conductance (SC) data were collected with pre-gelled disposable electrodes and were sampled at a rate of 125 Hz. Participants' nondominant hands were cleaned with a paper towel moistened with distilled water.

TABLE 1

Comparison of Ads Featuring Same- and Other-Sex Couples

	Study 1				Study 2				Study 3			
	Same-sex		Other-sex		Same-sex		Other-sex		Same-sex		Other-sex	
	M	SD	M	SD	M	SD	M	SD	M	SD	M	SD
Liking	4.44[1]	.12	4.72	.09	4.07[1]	1.67	4.79	1.30	4.83	.22	4.68	.16
Positivity	4.71[1]	.10	5.04	.08	3.91[1]	1.60	4.66	1.34	4.83	.19	4.70	.16
Negativity	2.21	.08	2.34	.08	3.02[1]	1.57	2.44	1.28	2.36[1]	.13	2.59	.11
Purchase Intent	2.99[1]	.12	3.46	.11	3.06[1]	1.54	3.69	1.45	3.25	.20	3.34	.16
Arousal	0.76[1]	.15	1.20	.15	3.35[1]	1.52	3.93	1.46				
Attention	-3.02	.79	-3.05	.79	6.21	1.07	6.27	1.01				
Negative Affect	-0.04[1]	.11	0.08	.11								

[1]Ads with same- and other-sex couples differ significantly at $p < .05$

TABLE 2

Responding to Same-Sex Ads Based on Presentation Order in Study 2

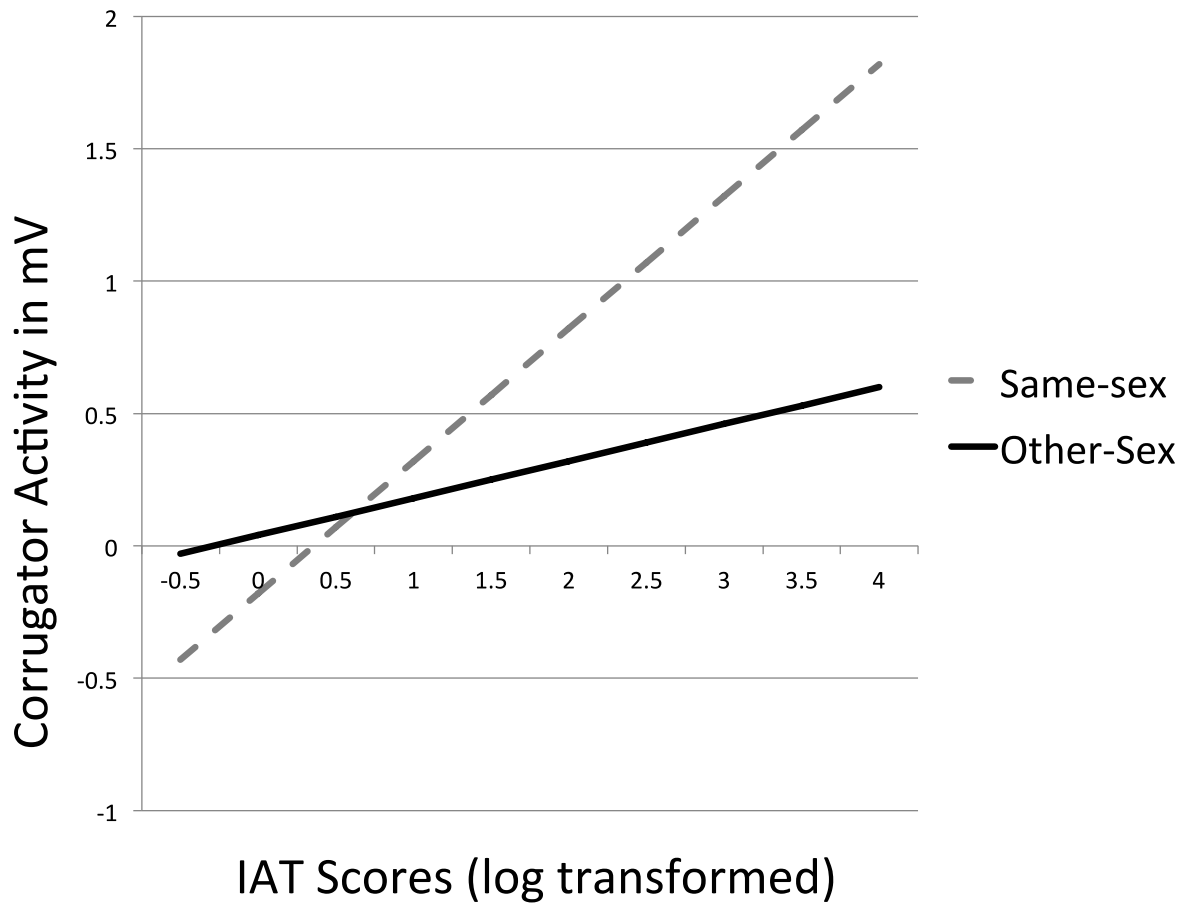|	Liking		Positivity		Negativity		Purchase		Excitement		Attention	
	M	SD	M	SD	M	SD	M	SD	M	SD	M	SD
First Ad	4.54	2.05	4.36	1.98	2.70	1.90	3.28	2.00	3.57	1.86	6.41	1.04
Second Ad	3.95	2.22	3.85	2.13	3.14	2.14	3.02	2.04	3.32	1.95	6.20	1.26
Third Ad	3.71	2.25	3.62	2.11	3.31	2.17	2.81	2.02	3.08	2.00	6.19	1.24
Fourth Ad	4.16	2.22	3.85	2.11	2.91	2.07	3.07	2.04	3.43	2.06	6.23	1.26
Fifth Ad	3.99	2.14	3.87	2.11	3.05	2.14	3.20	2.07	3.34	2.09	5.99	1.56

FIGURE 1
Corrugator change activity for ads with same- and other-sex couples based on log-transformed IAT score values
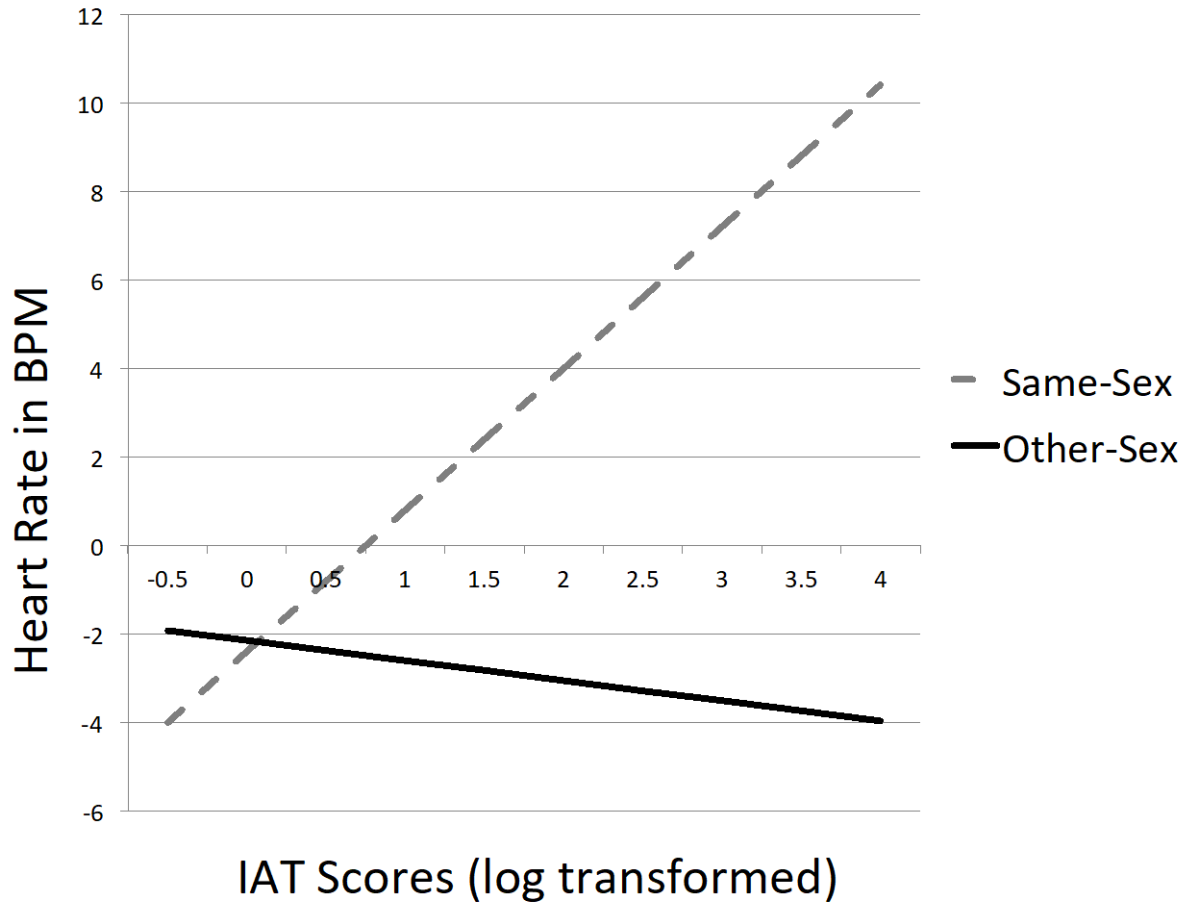
FIGURE 2

Heart rate change activity for ads with same- and other-sex couples based on log-transformed IAT score values